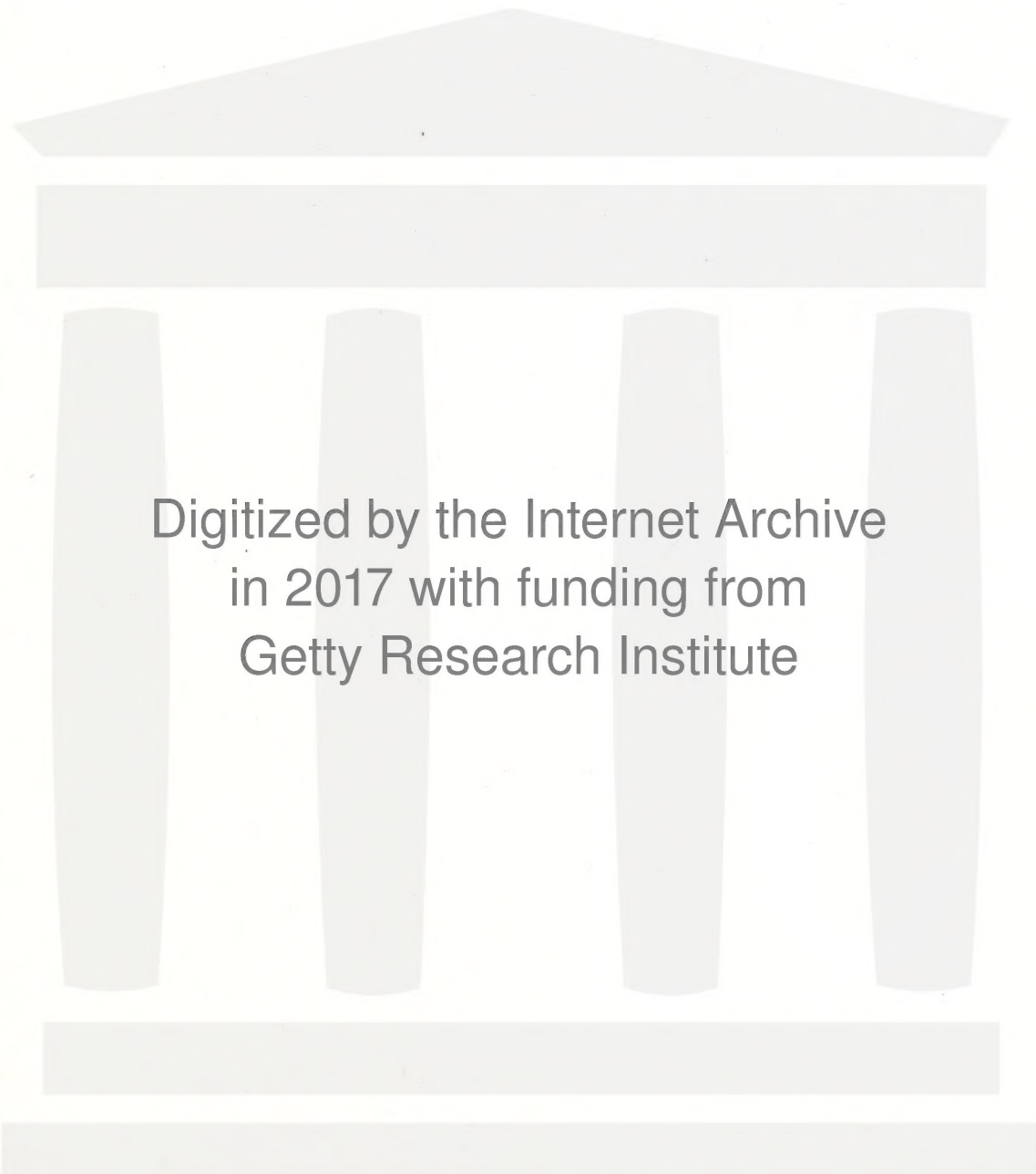


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THE BRITISH

JOURNAL OF PHOTOGRAPHY,

PUBLISHED WEEKLY:

MIDWEST INTER-LIBRARY CENTER
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VOL. XLIV.

LONDON: HENRY GREENWOOD & CO., PUBLISHERS, 24 WELLINGTON STREET, STRAND, W.C.
PARIS: BOYVEAU ET CHEVILLET, 22 RUE DE LA BANQUE.
NEW YORK: G. GENNERT, 26 EAST THIRTEENTH STREET, ANTHONY & CO., AND SCOVILL & ADAMS CO.
PHILADELPHIA: McCOLLIN & CO., ARCH STREET. SAN FRANCISCO: S. C. PARTRIDGE, 121 POST STREET.
MELBOURNE: J. W. SMALL & CO., BAKER & ROUSE, WATSON & SONS.
SYDNEY: BAKER & ROUSE, J. W. SMALL & CO., AND WM. CARGILL.
ADELAIDE AND BRISBANE: BAKER & ROUSE.
CAPE TOWN, NATAL, PORT ELIZABETH, AND JOHANNESBURG: B. G. LENNON & CO.

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THE LANTERN RECORD.

(Monthly Supplement to The British Journal of Photography)

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OPINIONS OF THE PRESS.

'*British Journal Photographic Almanac* for 1898. Henry Greenwood & Co., 24 Wellington Street, Strand.—This is one of the most valuable of the regular photographic annuals, and this year's issue fully maintains the position which the book now occupies in the esteem of photographers. The literary contents are composed of special articles, copiously illustrated, on various departments of photographic art. The mass of information is so varied that, without going right through the index, one could not possibly give a fair summary of its nature. The best thing for our readers to do is to see a specimen copy and decide for themselves whether it is not worth far more than the published price of 1s.'—*British and Colonial Druggist.*

'*British Journal Photographic Almanac.* Henry Greenwood & Co., 24 Wellington Street, Strand, London.—This old veteran, fat and full, turns up again, and is as good as ever. All the old features are retained, and there is much that is new and useful. The summary of the year's work is by the editor, and he deals very fully with "Animated Photography." There is a series of very interesting articles by well-known workers and others, including G. Watmough Webster, W. B. Bolton, W. K. Burton, E. Dockree, F. Dunsterville, P. Everitt, F. M. Sutcliffe, W. J. Warren, T. R. Dallmeyer, J. H. Baldock, W. T. Wilkinson, Matthew Surface, Chapman Jones, W. Fenton-Jones, R. Penlake, Alfred Watkins, Harold Baker, Rev. F. C. Lambert, S. H. Fry, and others—a goodly list indeed. A most useful section is "Practical Notes and Suggestions of the Year," compiled from various sources by the editor, and the list of novelties is useful. A very full lot of formulæ are given, and numerous tables of value to the worker in all sorts of circumstances. The frontispiece is a very delicate print on the "Wellington" platino matt bromide paper, and we have not often seen a more charming example of child portraiture and good printing. The price of the volume is 1s. paper, and 1s. 6d. cloth.'

Photography, Dec. 17, 1897.

'*The British Journal Photographic Almanac*, 1898 (24 Wellington Street, Strand, London).—The new issue is, like its predecessors, a bulky volume, containing several hundred pages of articles (by over a hundred contributors) on subjects connected with photography. Some additions to the formulæ section have been made, and the Editor (Mr. T. Bedding, F.R.P.S.) has endeavoured to epitomise as fully as possible all the important advances and improvements in practical photography that have taken place during the past year. There are several well-executed plates, and a number of other illustrations. The volume is published at 1s. net, or, bound in cloth, 1s. 6d. net.'

Salisbury and Winchester Journal.

'*The British Journal Almanac.*—The general form and character of this familiar Annual has for years past met with such general approbation, that no considerable departure need be expected. In a volume of such comprehensive character we can well imagine that the editor's difficulty is to keep the matter within reasonable limits, and the result, as seen in the Almanac just issued, is that every inch of space contains matter of use and importance. In photography, more than in many things, the practitioner needs to be kept well posted up in the productions of the numerous manufacturers, and hence it is well that at least once a year an Annual like *The British Journal of Photography Almanac* should come to us with a vast compilation of advertisements, as well as practical articles, formulæ, and reviews. The Almanac for 1898 has, as a Frontispiece, an admirable platino-matt bromide print on Wellington paper from a negative by Byrne & Co. Next comes the Editor's resumé of the year, then some 200 pages of practical articles by well-known writers, then a very useful compilation of formulæ and practical notes, and a few notices of new apparatus, formulæ, &c. Not the least useful feature is a directory of Photographic Societies throughout the world. It is published by Greenwood & Co., of 24 Wellington Street, Strand, at 1s.; cloth, 1s. 6d. Another year comes to its close, another broad green cloth back finds a place upon our shelf, and a useful book for daily reference is added to our store.'

Amateur Photographer, December 17, 1897.

'*The British Journal Photographic Almanac* for 1898. Edited by Thos. Bedding, F.R.P.S., and published by Henry Greenwood & Co., 24 Wellington Street, Strand. Price 1s. paper, 1s. 6d. cloth. The frontispiece is a charming little child study from a negative of Byrne & Co., of Richmond, and printed by Wellington & Ward on their platino-matt bromide paper. The editor contributes a useful summary and review of the past and present condition of animated photography, and the bulk of the literary matter is of the usual style which has become associated with "annuals." We are glad to note numerous new formulæ and tables, and an index to the same. It forms a very valuable reference book to all the latest novelties of the day, and for this alone the book is well worth the money.'—*Photographic News.*

'*The British Journal Almanac* for 1898. This stout volume consists of over fourteen hundred pages, including advertisements, and sells as usual at the modest price of a shilling. The Editor, Mr. Bedding, provides his customary useful summary of the progress of photography during the past year, and a particularly interesting *résumé* of discoveries in connection with animatography. The usual notes and contributions from everybody make up a capital volume.'—*Practical Photographer.*

'A book that should find an honoured place in the technical library of every photographer, professional or amateur, is *The British Journal Photographic Almanac*, the new issue of which for 1898 is, if possible, more complete and exhaustive than any of its predecessors. There are some particularly interesting notes on colour photography, and innumerable suggestions and instructions concerning the latest methods in photography. The bulky volume is published by Messrs Henry Greenwood & Co., 24 Wellington Street, Strand, London, and is a marvel at the price—one shilling net, in paper covers, or eighteenpence, strongly bound in cloth.'—*The Lady.*

'*The British Journal Photographic Almanac* for 1898. (London: H. Greenwood & Co., 24 Wellington Street, Strand.)—This publication again appeals to all interested in the art of photography. The progress made in different branches during the year is duly chronicled, and there is a mass of new and valuable information. The variety and extent of the contents may be judged when it is mentioned that the index occupies four and a half closely printed pages, articles are written by more than 120 contributors, and the book consists of over 1400 pages, nearly 600 of which are devoted to the description of new ideas, inventions, and formulæ. The immense stock of advertisements also adds to its value as a reference book. Among the contributors are Mr. H. P. Robinson, of Ludlow, President of the newly-formed Ludlow Photographic Society, and Mr. Alfred Watkins, one of the Vice-Presidents of the Herefordshire Photographic Society. The work has also the further recommendation of being exceedingly cheap, and it should find its way into the hands of all up-to-date photographers.'—*Hereford Times.*

'*The British Journal Photographic Almanac*, 1898.—Here in a volume of nearly 1500 pages, we have the quintessence of a year's photographic journalism—a wonderfully complete record of photographic progress in the past year, and a collection of tabular and advertising matter of the utmost value. The body of the almanac is made up of articles by the most eminent specialists in various departments of our art-science. We notice that, in dealing with living-picturography (p. 661), it is affirmed that "Theory demands intermittent motion, as without it is difficult to conceive that a series of distinct and disconnected pnotographs can be presented to the retina." . . . On the whole this almanac lives well up to its reputation as an inordinately big shillingsworth and, moreover, a standard work of reference.'—*The Optician.*

'*The British Journal Photographic Almanac for* 1898. Price 1s. This opulent Annual comprises 1408 pages, of which something like 900 are advertisements. There is a tradition—how far correct we know not—that in the first year or two of the issue of this annual the original proprietor had grave doubts whether the venture could be made to pay. We wonder what he would think of his progeny now. Of interest to process workers may be mentioned the articles, "Plain Language about the Spectrum," by Walter White; "Some Notes on the Half-Tone Process," by William Gamble; "The McDonogh (Joly) Proecss of Colour Photography," by Milton B. Punnett; and a reprint of an article by V. Turati on "The Enamel Process on Zinc." There are, however, many other matters which will indirectly interest process men, and besides, the book as a whole is an invaluable work of reference. The illustrations are not numerous, but we would direct attention to the example of the Heliochrome Process by Waterlow & Sons, Ltd. It is a group of Bryant & May's match boxes, and the reproduction is wonderfully realistic. As an example of the commercial value of three-colour work it is most convincing.'—*Process Work.*

'*The British Journal Photographic Almanac and Photographers' Daily Companion* for 1898. Edited by Thomas Bedding-F.R.P.S.—This is one of the most remarkable of annual publications—extending in all to over fourteen hundred pages. To professional and amateur photographers the book must be almost indispensable. There are useful formulæ for the practical worker, descriptions of all important advances and improvements during the year, and hundreds of special articles on colour photography, animated photography, copying, developing, lantern slides, outdoor work—on almost every matter likely to interest the photographer. Many of the articles are illustrated, while a few artistic prints are also scattered through the volume.'—*Orkney Herald.*

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1913. Vol. XLIV.—JANUARY 1, 1897.

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EX CATHEDRÂ.

While it would be manifestly improper for us to subject, in these columns, The British Journal Photographic Almanac for 1897 to critical review, we may, nevertheless, in observance of precedent, call attention to some of the main features of the volume. The editorial article, entitled "Modern Photographic Lenses," briefly describes and discusses most of the photographic lenses that have been devised and introduced during the past ten years.

* * *

The contributed articles number over 100, among them being contributions by G. W. Webster, W. B. Bolton, Redmond Barrett, Albert Lévy, Alfred Watkins, W. K. Burton, T. N. Armstrong, H. P. Robinson, E. C. Middleton, W. T. Wilkinson, G. T. Harris, A. L. Henderson, W. Gamble, R. H. Bow, F. H. Varley, P. Everitt, F. Krohn, J. V. Elsden, E. Dockree, G. E. Brown, J. H. Baldock, A. Brooker, H. N. King, Harold Baker, A. Mackie, J. S. Teape, Hector Maclean, F. H. Burton, Rev. T. Perkins, Edward Dunmore, Chapman Jones, R. Child Bayley, Gambier Bolton, R. L. Maddox, F. M. Sutcliffe, Dr. Carter Browne, G. R. Baker, E. W. Foxlee, Rev. F. C. Lambert, &c.—a goodly list, of which we own to feeling somewhat proud.

The epitome of progress in 1896 places the reader in possession of essential points of information with regard to radiography, acetylene, animated photography, and other subjects that have recently come into prominence among photographers. A section is devoted to patented inventions of the year; many of these have some bearing on methods and processes at present engaging experimental atttention—notably, colour photography. In another section—"Practical Notes and Suggestions of the Year"—the attempt has been made to concentrate much useful information on a great variety of practical topics. The illustrations by Messrs. Morgan & Kidd, Elliott & Son, and Wellington & Ward (bromide prints), and the Electric Photo-Printing Company, and Waterlow & Sons (collotype), have been highly appreciated and admired as first-class examples of both printing processes.

* * *

"Recent Novelties in Apparatus" is the record, in most cases, of practical experience with the articles described. The formulæ section of the Almanac has been revised and rearranged, many additions of fresh matter and the elimination of old having been made with the view of extending its usefulness. The Copyright Act is included. The list of societies shows no falling off numerically. The Almanac this year extends to 1384 pages. It is the largest yet issued. Doubtless, most attractive reading matter could be derived from the recorded statistics of the production of such a large volume; we may therefore incidentally mention two items that may be of interest, viz., that for the 1897 edition of the Almanac about twenty tons of paper were used, and that to bind up the work 120 persons were employed for a week!

* * *

We are informed that the Council of the Royal Photographic Society have elected Mr. Horace Wilmer to the position of Hon. Secretary of the Society. Mr. Wilmer's qualifications stamp him as eminently well fitted to occupy the position. He is a good photographer, a first-rate man of business, and has all the personal characteristics for enabling him to carry out the duties of his office with dignity and success. We congratulate the Society on its new Hon. Secretary.

* * *

It will probably interest many of our trade readers to know that the next meeting of the Photographic Club to be held at Anderton's Hotel, Fleet-street, on Wednesday evening, January

6, at eight o'clock, will be a "trade night" devoted to showing and explaining novelties in apparatus, &c. Makers wishing to exhibit novelties are requested to communicate with the Hon. Secretary of the Club, Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.

* * *

This is a fitting opportunity for us to acknowledge the expressions of seasonable good-will that have recently reached us from many of our readers; nor must we omit reference to some dozens of kindly letters of congratulation on the appearance of the Almanac for 1897. All those who have so written, or have sent us Christmas or New-year's cards, have our warm thanks, and the sincere wish that for them and for all photographers the year just opening will be a happy and prosperous one.

ARE WE PREPARED FOR WINTER?

We have now entered the new year, and, up to the present, we have experienced no severe weather in the neighbourhood of the metropolis, or, indeed, in any part of the kingdom, such as would cause any serious inconvenience in the practice of photography. There is no telling, however, in this uncertain climate of ours, whether we shall, or not, have any real winter this season; but, there is no reason why we should not, as the long and severe frost of a couple of years back did not set in till some time after this date. The inconveniences it then caused to photographers, in the form of frozen, or burst, pipes will be fresh in the memory of all who experienced them, and who, more or less, did not?

Few there are, we imagine, who, when they found their water supply frozen, did not realise how easily it might have been prevented by a little timely precaution. Then most determined to take it before the next advent of winter, it would be interesting to learn how many—even those who were put in the greatest difficulty—are, at the present moment, prepared for a repetition of the winter of two years ago, if it were to set in suddenly? How many, after the trouble was over, thought any more of having the supply pipe laid deeper in the ground, for example? Here are a few practical hints that may serve as reminders at this season:—

One of the most important things in a photographic establishment is the water supply. If the supply pipe to the building is still near the surface, it may yet be protected from frost, and there is no better way of doing so than covering the ground, where it passes, with a foot or so of stable manure. That will afford perfect protection. If there are any pipes exposed outside the building, they should at once, without waiting for frost, have several thicknesses of common felt carpeting, in strips, wound round them, and that clothing further supplemented by hay or straw bands. The freezing of the pipes within the house may be prevented by simply emptying them every night, for there is little fear of their freezing during the daytime, when the water is in continual use. The most convenient way of doing that is to have a stopcock fitted close under the cistern, which is shut off after the day's work is over; then all the lower taps are opened. Just below the stopcock a small air cock should be fitted, and this must be opened when the other is closed, so as to admit air, when all the water will drain out of the pipes.

An extemporary arrangement, which will answer quite as well, is to plug the outlet pipe of the cistern with a piece of tube of sufficient length to reach above the surface of the water in the tank—a piece of iron "gas barrel," made to fit by binding the end with rag or brown paper. If, when the pipe is plugged with this, all the taps be opened, the water will run out, the tube serving to admit air, without which, of course, the pipes could not empty. If these precautions are not taken in time, and perchance the pipes get frozen, they should at once be carefully examined throughout their length to see if there are any bursts. If so, they should be repaired without delay, and thus avoid a flooding when a thaw sets in.

In England winter is seldom turned to a profitable account by photographers, particularly in portraiture. In Canada, and in the States, the case is very different. There a large business is done in portraits taken under wintry aspects—snow-clad backgrounds, and accessories, for example; and, sometimes, with the appearance of falling snow produced by spraying, or splashing, over the negative with an opaque pigment. One reason why this style of portraiture is so little thought of here is, that we cannot rely upon having a hard winter, and it would not be quite in keeping to have portraits, taken under wintry aspects, if there happened to be no hard frost or snow that season. But, in the event of such a winter occurring, how many are prepared to profitably avail themselves of it? Have they suitable backgrounds and accessories for the work?

Few, we imagine, have gone to the cost of providing such things on the mere chance of their being wanted. However, no great outlay is necessary; all that is required, in the shape of a background, is any old outdoor scene and a piece of chalk. The latter is applied to the sunlit portions, and all parts which, if in the solid, snow could settle upon; while wadding, or cotton-wool, laid on the solid—outdoor, of course—accessories will give a very good imitation of snow in the photograph. Sheets of wadding, tacked with cotton on to a sheet, and laid on the floor of the studio, will complete the winter scene. Although, as yet, we have had no real winter, there is no reason why the portraitist should not be ready for it, by having specimens ready to show if it does set in, for, if it does, the business will be of limited duration, though, for the time it lasts, tolerably brisk to those who secure it. In Canada it is, to those who make a speciality of it, a small harvest.

Provincial photographers might often make more than they do of views of local places taken under winter conditions; the cathedral, the castle, or other places of interest, covered with snow, always meet with a ready sale to accompany Christmas and New-year greetings the following winter.

Turning from professionals to amateurs, we may ask if they are fully prepared for winter photography? Charming pictures of winter scenery are to be obtained, but often they must be taken at very short notice. For example, trees and shrubs covered with hoar-frost, sparkling in the sun, make most beautiful subjects for the lantern, but they must be secured forthwith, as the sun quickly melts the crystals, and then the beauty of the scene is lost. To get the best results, the plates should be backed; so they should be for snow-clad scenes. Are backed plates ready to hand? Although we may pass a winter without snow or severe frost, there is always a greater or less prevalence of hoar frosts until quite in the early spring, hence plenty of food for the amateur's camera.

Gold and Silver in the Sea.—Some further information on this interesting topic was conveyed by Herr E. Sonstadt, in a paper recently communicated to the Chemical Society. By shaking up a little over half an ounce of mercury with half a gallon of sea water for a long time he was able to extract enough to give, on cupellation, a minute globule of gold. Herr Sonstadt was also able

to extract silver by the same means, this result showing that, as silver chloride, either wet or dry, has no action in mercury, the most natural inference appears to be that the silver salt in sea water is so far attenuated by dilution as to have undergone molecular disruption, so that it may be considered to be present as metallic silver in solution.

Röntgen Rays for Anatomical Work.—Messrs. Charles Remy and G. Contremoulins have found in certain radiographs of injected portions of the human body means of increasing our knowledge of the minute details of various parts of the human frame. The veins and arteries were injected with a solution of sealing-wax containing fine bronze powder in suspension, so as to be opaque to the rays. It will suffice here to state that these experiments point out that the distribution of the vessels is given exactly without the disturbance rendered inevitable in dissection. One notable part of their work has been the production of prints taken stereoscopically, a plan which it is easy to see will—though, it is understood, roundness of an individual artery or vein cannot be expected—enable the localisation of each particle of minute texture to be seen in a most advantageous manner.

A New Kind of Pyroxyline.—We have for a long time had before us blasting gelatine, a kind of gun-cotton, partly dissolved in nitro-glycerine, but Professor Mendeleef has now described a fresh form. In a general way, soluble photographic "gun-cotton" has been described as di-nitro-cellulose, and the more soluble explosive variety as tri-nitro-cellulose. The Russian professor's variety seems to be a further modification; but it is rather difficult to understand the brief abstract given of the new agent in a scientific contemporary. It states that the "pyro-collodion discovered by Professor Mendeleef is a new form of nitro-cellulose, midway between ordinary gun-cotton, which contains about thirteen per cent. of nitrogen, and collodion, containing about eleven and a half per cent." We presume by collodion is meant gun-cotton for making collodion. The new substance, however, whatever its possibilities, is not intended for the innocent photographic plate, but for the deadly purposes of warfare. It, nevertheless, so far resembles our photographic preparation of guncotton, that it is made in strips or ribbons.

Radiographs Direct on Paper.—A writer in *Nature* adds force to our remarks in the ALMANAC, that there has been little real addition to our knowledge on the subject of X rays, beyond what appears in Röntgen's original paper, by stating that "I think it may be said that we are still in a state of empiricism as to the technique of the subject." It is clear, however, that his acquaintance with photographic methods is but slight, for he concludes his letter by saying, "I should be glad of information as to the best method of working direct on to sensitised paper, to save the time and expense involved in taking glass negatives." Now, it is quite evident that, taking the sensitised paper he speaks of to mean a printing-out paper, the exposure would be too protracted for any useful purpose, even if he adopted the plan of developing up a feeble image. The only possible practical plan would be to use a bromide developing paper, though even here he would find more protracted exposures to be needed. Possibly some of the makers of these papers might not be disinclined to give some rough idea of the relative rapidity of their paper and plates.

Kites for Aërial Photography.—We have on a previous occasion referred to the experiments at the Elm Hill Observatory with kites carrying meteorological instruments, and caused to ascend to great heights. A recent communication to our contemporary *Nature* gives considerable detail as to the means adopted and the results obtained, which are such as to make it quite certain that, granted a suitable exposure machinery, these kites could be made to subserve most important uses for photographic observation. To begin with, the writer, Mr. H. Helm Clayton, writing from the Observatory, says that the steps so far taken "show that clear and definite meteorological records can be obtained at a great height by means of kites at a comparatively small expense." The meteorograph weighs three pounds, and records temperature, humidity, and atmospheric pressure. The record of October 8, from the earth's surface to an altitude 9375 feet above sea level, was as clear and sharp as the records of similar instruments in thermometer screens at the Observatory, and so on. Now, it is evident that for military and surveying purposes such altitudes would be unnecessary, so that the difficulties to surmount would be much less than in their successful ascents. Possibly, to make exposures by electrical means at any moment deemed necessary would be a difficult task; but almost every requirement might be fulfilled by a clockwork arrangement to make a series of exposures at arranged intervals of time. With regard to any difficulty in raising a camera, that would not exist, for, to quote Mr. Helm Clayton again, he says, "The ease with which a meteorograph can be lifted to the height of a mile is shown by the fact that this was accomplished three times in four days during August in normal weather conditions."

Arsenical Soap.—A fortnight ago we referred to two cases heard before the Brentford Petty Sessions, in which certain pharmaceutical chemists were fined, under the Foods and Drugs Act, for selling arsenical soap that contained no, or only an inappreciable quantity of, arsenic. The defence in these cases was, firstly, that soap was not a drug, which was over-ruled; and, secondly, that the soap did contain arsenic, and evidence was given that two and a half grains of arsenic were included in the composition of a hundredweight of soap. In the same issue we published an article on the same subject which quoted a case heard at the Brentford Police-court (we presume, for want of information, that the Brentford Police-court and the Brentford Petty Sessions are separate courts of jurisdiction), in which another pharmaceutical chemist was proceeded against on precisely the same grounds; but in this case the magistrates decided in favour of the defendant on the ground that, "as arsenic had been introduced into the soap, in however small a quantity, the charge must fail." Thus it appears that two decisions, diametrically opposed to each other, have been given on precisely the same case, in the same town, and probably in the same building. In connexion with these cases, and perhaps with some still to be reported, the following advertisement is interesting reading. It appeared in the *Daily Mail*, but, doubtless, it has also appeared in other papers:—"Notice to Chemists (Wholesale and Retail). Foods and Drugs Act. Chemists are requested to immediately exchange their present stocks of Dr. Mackenzie's Arsenical Soap for that which is now manufactured under an improved formula.—Send to S. Harvey, 5, Denman-street, London Bridge, S.E." Our correspondent wound up his short article by saying that, "between inspectors under the Foods and Drugs Act and the Pharmaceutical Society, sellers of arsenical soap ought to have a merry time of it." It seems that they will if the Poisons Act is to be put as actively in force as the Foods and Drugs Act in Brentford. We have, of course, no means of knowing whether the improved formula referred to in the advertisement is one in which the arsenic is to be wholly eliminated so that the soap may be sold over the counter without fear of the Foods and Drugs Act inspector's watchful eye in protection of the public, or whether the quantity of arsenic is to be increased to the grain and a half per pound of soap which an expert witness testified was the least amount which was necessary to be present to be serviceable, and which would be certain (shall we say except in the case of registered chemists?) to bring the article under the notice of the watchful eye of the Pharmaceutical Society in the interests of the public; but we may most unreservedly state it as our opinion that, even were the minimum amount of arsenic necessary to be serviceable largely exceeded, the article would not be dangerous. The position of affairs is an interesting one to photographers, and especially to dealers in photographic chemicals. The Pharmaceutical Society has apparently taken the ground that it is bound to carry out the Poisons Act actually to the letter and without any consideration whatever as to the spirit. There are numerous instances of dealers in photographic chemicals, especially in provincial towns, who have been subjected to a system of persecution, through the Pharmaceutical Society, at

the hands of their rivals in trade who happened to be within the charmed circle. Now it remains to be seen what action the Pharmaceutical Society will take when members of their own trade are involved. Any way, it would seem that a very profitable trade, though perhaps a limited one, must be lost to the druggists—Scylla, the Foods and Drugs Inspector; Charybdis, the Pharmaceutical Society. Of course Scylla can be avoided by the simple expedient of selling the genuine article; but then, if the Pharmaceutical Society does its duty, Mary Jane must endure her pimples.

DIGRESSIONS.

No. XIII.—Good Resolutions.

I know what everybody will say about paving stones and their connexion with good intentions and a certain place which I would not mention for the world, but I think it does any man a service to make a lot of good intentions at certain times; he may not keep them all, but, if he has a medium conscience only, he will keep some of them. Surely the beginning of the year, when good intentions should be in season, is the time not only to determine what to remember to do, but what to forget; to set about removing the rubbish from our minds, our studios, and our lives; to sort out the worst and to keep the best; to remember what was wrong in the past, only that it should help to correct the future. I almost wish I could induce all photographers (especially professionals, as it may save them money) not to learn anything this year, but to devote their abundant leisure to forgetting.

Every professional photographer wishes to improve his business; every amateur with any ambition (I exclude the thousands who only play with a camera) wishes to do better work; and it can be done, although some will be inclined to doubt whether this bold assertion applies to themselves.

I quite admit that art cannot be expected from everybody. I go further, and freely agree that art in photography is difficult; not easy even to the few, and impossible to the many, but there is such a thing as *taste*, which is an excellent substitute, under certain conditions. Let every photographer pass a New-year's resolution to improve his taste, and see that he does it.

This is a general proposition; let us come to particulars.

What is the first thing we can do to improve our taste? I don't suppose one photographer in a hundred would hit upon what I am going to set before him, as showing the most undoubted and general bad taste among photographers. It is nothing more nor less than the use of pink albumenised paper. Let the first resolution, then, be, Abolish pink paper. Do this, and a great step in the improvement of taste will be accomplished.

The one answer of every professional photographer, when you tell him anything is not in good taste, is "I know it isn't, but what am I to do? The public will have it so, and I must live." You are almost tempted to reply, you don't know why! as there is no particular use in the world for all the photographers, but you content yourself by pointing out to him that, although the much-enduring public may not have sufficient taste to object to a particularly offensively tinted paper, it certainly has not, as a rule, sufficient sense to know or care whether you use pink or white paper. How, then, can it be said that the public insists? It resolves itself into a miserable excuse for want of taste or thought on the part of the photographer. Why the public insists or feels so little that they would never have cared for the photograph itself if it had not been thrust upon them; they would never have missed it, and gone on liking miniatures. I was in business many years, and never remember losing an order because I would not use pink paper, and was dreadfully troubled at seeing it used in my old studio the other day.

If portraiture generally is to be improved, the first thing to be done will be to banish pink paper; let us stand not on the order of banishment, but banish at once. The eye that can endure pink paper ought not to have anything to do with pictures.

There is an awful lot of nonsense talked about this "supplying a want," and giving the public what they require. I don't mean with revolutions so much as with improving innovations; not that I object to an occasional revolt, but you must *lead* the public, not drive them. They are easily led, and, indeed, if we may judge by the style of some advertisements, they even show a strong disposition to believe anything, and allow themselves to be driven; but ought we to take advantage of the weakness? The tone of many advertisements now is to peremptorily order you to buy this or that, and I have seen a little tailor in a back street announce that he is the greatest cutter in the universe, and that you are to to get your clothes of him. I think I have seen photographic advertisements nearly as strong. Don't accuse the public, but take yourself to task, and see if it is not your own bad taste that leads you to use pink paper.

I cannot help returning to the subject. I wonder why you really do it? What is your theory? This is mine. You were led into it gradually, and now say it is the fault of the public. This is how it came about.

Years ago there was a great dread of sulphur toning, and manufacturers endeavoured to hide the supposed defect—a by no means unpleasant warm tint—by smothering it in aniline dyes. At first, a lovely pale grey was used, which gave a very fresh, healthy effect to the print. Then, of course, another maker must go one better, and the newest thing in albumenised paper was a pale pink. There is the weak spot—the "newest thing." It remained at that a few years, with occasional attempts at loudness and coarseness. Then, I suppose, some low-down photographers got some pink stronger than usual, and startled their neighbours with "portraits in colours." The first strong pink photographs I ever saw were in the window of a shop where you could get a penny shave. That the public "insists" is, at present, one of the fallacies of the profession.

The next important resolution of the year should be to take a pride in your photographic library, and continually add to it, and to take in all the photographic journals you can afford, and read them. It costs very little, and the advantages are enormous. I say this from long experience. I began taking in a journal in 1853, and have continued to do so, and have now complete sets of all the journals published in England, many American and foreign journals, all the year-books and almanacs, and many of the books, and have congratulated myself ever since on having done so.

What matter that I have had to build a room to accommodate the various publications; they are all arranged and in order? But I have had to give up the advertisements. I hope those tons of announcements (!) sent away in a cart the other day have done their duty. I tried to build a palace of truth with them, but, by some accident, the foundation gave way. I have a wicked plan of easing the burden early now. Those advertisements that are in the place provided for them by Providence, that is, *outside* the reading matter, are religiously read—if they are not upside down; those that I can only look upon as matter in the wrong place, that is, mixed up with the reading matter, are removed before the paper gets to me. This is a heavy tax on one of my household, but enables me to read the paper without profanity.

I have heard libellous people remark that the only kind of reading photographers care for is their daily paper and the literature of their profession, especially the scientific side of it, and that nothing is esteemed quite so well as something that is of no use to them, such as an account of a new developer, or the evolution of it. I wish they cared still more than they do for the periodical literature of photography.

When travelling, I always take the opportunity of going into a photographer's showroom, to ask for a glance at the photographic papers, almost invariably without effect. Only to-day I called on a photographer to congratulate him on winning a trumpery medal at an insignificant show, and he said, "Oh, you have saved me a penny, I was going to the bookstall to get a paper to see if I had been rewarded for sending that heavy case of framed goods."

This morning I was watching the starlings feeding on the lawn. There was a vast deal more food than was necessary; yet, when one found a bigger piece than the rest, there was a fight and a chase, and the others, who could not have wanted it, made for the doubtfully lucky finder of the prize, and endeavoured to rob him of it. This

uggested to me that, in a truly honest and most impossible world, a ıan may do good without being obliged to suffer for it. (Not that he greedy starling that took the biggest piece did good.) He may ven indulge his fancy without being much the worse; but, under he present state of things, a man cannot even invent any simple hing without being in terror of his life or reputation, or shuddering t the horror of being apparently detected as an impostor, or as aving fraudulently attempted to live on the cast-off or otherwise vorthless property of others. There have been several cases of the ind in the year that has passed. This sort of thing frightens away nuch useful knowledge, and the nervous discoverer of anything use- ul keeps his good things to himself, for fear of being called a lagiarist or worse.

It may appear incredible, but I once made an invention myself. I vill never make another if I can in any way help it, and, if I saw he ghost of an idea coming, I should be as frightened as though it vas a real turnip lantern; and, if I innocently could not avoid one, I should certainly burke it in its birth, however promising.

We will leave out the professional tracker who attends societies or the pleasure of the off chance of bowling over a brother member —he cannot help being born mean—but let the rest of us resolve to e gentle with anything useful that is brought forward in good faith, ven if it is possible to a deceased memory to remember something ike it that was discarded years ago.

It is still the almost invariable rule to treat the technique of every hotograph alike. If we will think a little, we shall see this is not easonable. Two of the most charming pictures I know are at the pposite poles of technique. The one is Mr. Davison's well-known *Old Farmstead*, perhaps better known as the *Onion Field*. This is, I believe, a "pinhole," any way, the image is much diffused; the ther I have only just received. It is a delicious little picture, epresenting the *Hay Mill, near Ludlow*, by Mr. Seymour Conway. t would serve no purpose to analyse this picture, or point out its eauties, except to say that it is full of atmosphere, relief, and readth; the point is that it is the sharpest photograph I ever saw, nd yet the treatment so absolutly suits the subject that it seems mpossible to conceive that any other treatment would suit it at all. Let us, then, resolve to carefully study every subject without pre- udice, before we decide on its technical execution. This study ught to add a fresh interest to the New-year's work. But, if we find hat all ways lead to art, that is surely not a good reason for denying rt in photography altogether.

There are many other resolutions worth taking, but, if you keep ll the above, they will be enough for one year, and you may keep hese words in your mind, "I can at least cultivate good taste."

Just another good resolution by way of important postscript. Resolve not to throw away your work, and do mischief to others by iving away your pictures to publishers. Reproduction is now done o well—when it is worth while—as to absolutely stop the sale of he original photograph. The photograph that is not worth at least a guinea for right to reproduce, in one paper only, is not worth nything, and its producer should be ashamed of it. Photographers lo not seem to be yet aware of the immense profits that are made ut of illustrations they are foolish enough to give away.

And lastly, Resolve to go to the Convention in July, and prepare for it early.

H. P. Robinson.

BY THE WAY.

It is just twelve months since I began these notes, and I have just been spending an idle hour in turning over the pages of the volume just closed. It is proverbially unwise to "prophesy unless you know," and similarly it is rather difficult, in keeping up a running comment on contemporaneous topics, to be sure that the opinions expressed will hold good in twelve months' time; but, so far as my retrospect of the year is concerned, I do not think I have gone far wrong.

It is just twelve months, for instance—it was in the opening number of the year—that I alluded to the attempt then being made to introduce "new blood" into the Royal Photographic Society's Council—I prefer still to call it the "parent"—and I deprecated the action of the malcontents who appeared determined to turn topsy-turvy pre-existing arrangements. What is the state of affairs now? The attempt has partially succeeded, and the first result is the resignation of two of the most important and valued officials, whose long connexion with the Society and its affairs—if no other reason existed—would alone suffice to make their loss a serious one. I have not one word to say against their successors, except that they are new men at the particular post where there was not the least necessity for a change. The Earl of Crawford is not only a man who has been known for years as an ardent worker in various branches of science, but, what is more to the point in this connexion, he is a practical photographer who, in bending photography to his purposes, makes himself thoroughly acquainted with its principles, instead of trusting to the "touch-the-button" plan. Mr. Cembrano is too well known to metropolitan photographers and to members of the Convention to leave any room for doubt as to his suitability for the post of Secretary. As a member of the British public, no less than as on old member of the parent Society, who does not perhaps attend its meetings as regularly as he once did, I would personally much prefer to see the Society represented by an old and well-tried member who "knows the ropes," so to say, than by "new blood," however eminent. New "blood," like new brooms, is apt to be energetic, and energy, when not under proper restraint, has a strong tendency in the direction of "upsetting the apple cart." Besides, I should like to know precisely the sort of "new blood" that is to be introduced. I remember a similar movement got up about a dozen years ago, which, although it ultimately resulted in the infusion of a certain amount of novelty into the Council, certainly had not the effect desired by its promoters, since the most active of the agitators for reform were rather severely let alone when the ballot papers were counted; and, having failed in their prime object, the subsequent proceedings interested many of them no more.

Far be it from me to impute ambitious personal motives to the supporters of the present movement, or to appear to imply that the new-blood scheme is based upon a purely selfish foundation. The intentions of all concerned may be thoroughly disinterested, and, no doubt, are; but I think they might place a little more confidence in the common sense of the present Council and of the members generally, and give them credit for the ability to "run" the Society on proper lines, trusting to the chapter of accidents for all the new blood that may be necessary. I for one believe that, if a *plébiscite* of the members were taken, the Society would decide, by a large majority, in favour of the management being in the hands of *the Council* rather than of a clique of metropolitan wire-pullers.

It is scarcely a year since the great discovery of Professor Röntgen startled the photographic, annd interested the whole scientific, world; and yet now it is almost impossible to believe, in view of the important results that have been obtained already, that the New Photography is really so young. Looking back to the early part of last year, I must confess to a certain amount of scepticism as to the ultimate value of the new discovery, and, although I could imagine various useful applications of the X rays in the distant future, I was somewhat dubious on the score of their early realisation. This has turned out to be a veritable case of prophecy without knowledge, for surely the progress already made in the useful application of the new rays has far exceeded the most sanguine expectations of a short twelve months, and leaves us helpless to imagine what further advances another year may bring about.

But, if I was slightly out of my calculation with regard to Röntgen photography, I fancy I pretty nearly "hit the mark" in connexion with Professor Herkomer's new process—I beg pardon, "New Art;" for, in spite of the great flourish of trumpets with which it was heralded in the daily, and weekly, and "art," and some few quasi-scientific papers, it has never been heard of since; in fact, it seems to have proved a case of rocket and stick. Carbon printing, without transfer, although not to be classed, perhaps, in the same category, has not made much progress, owing to the fact that it requires more skill and brains in its working than the modern amateur is willing to lavish on it.

In connexion with one other subject I have had to do with during the year—the "Poor Chemist"—a further "complication," as it may be termed, has recently been developed in connexion with the arsenical soap prosecutions. At two different courts in the same district—Brentford—precisely opposite decisions have been given on the same point. The police magistrate rules one way, and the divisional magistrates the other; so, after all, who is to decide? Then, again, if "arsenical soap" without arsenic is a fraud, what about platino-bromide paper and similar fancy names? It seems to me that, when, as in one case, arsenic was present in quantity sufficiently minute to be harmless, and yet the soap was condemned bromide paper containing absolutely no platinum would come under the same ruling, though, on second thoughts, it is not a "drug."

Coming to a later date, I notice, in last week's issue, Mr. H. P. Robinson corrects an assertion I made in my last notes. While accepting the correction as it stands, I would point out that, in reality, it only adds further force to my argument. In saying that "H. P. Robinson mastered photography before he attempted art," I was referring solely to his photographic work, meaning that, before he began to exhibit photographs at all, he had learnt how to take them, and here he himself bears me out. I was well aware that Mr. Robinson had had independent art training, and my argument simply went to show that he did not attempt to make that do duty in place of photographic training. It is too much the fashion nowadays for people who have a smattering of art training, or think they have, to dispense with, or try to, the most elementary photographic practice, and to cry it down as inimical to art. A good photograph can scarcely be a picture because it is sharp, but the worse the photograph the more art the "picture" contains. That seems to be about the new theory.

By the way, if I remember rightly, it was in the early fifties that the late President of the Royal Academy and a few friends were founding the so-called pre-Raphaelite school of painting, and this seems to be about the period when H. P. H. was hovering between the brush and the camera. Can it be that, with a leaning towards the "new school," and recognising the utter inadequacy of the brush in rendering the detail he desired, he finally decided to adopt the camera? If so, so much the better for photography and the worse for painting. If he had not made the change, he might have been elected President of the Academy last year instead of only the Convention. And what do the "fuzztypers" think of the conversion?

Further, by the way, knowing H. P. R.'s opinion on the subject of "anonymous" writers, I hope he will forgive a bit of friendly chaff.

Mr. James Stein writes me regarding my remarks on cycling last month, and pointing out his reason for recommending the high machine for carrying purposes on account of its different steering conditions. I can quite follow his explanation, and, though I have been more or less mixed up with cycles since the introduction of the old "boneshaker," I never succeeded in learning to ride the "two-wheeler," so am practically without experience in steering matters. But, from an outsider's point of view, it does seem as if the low machine would prove easier for carrying than the high, and in the main I think Mr. Stein agrees with me.

DOGBERRY.

DR. SELLE'S PROCESS OF PHOTOGRAPHY IN NATURAL COLOURS.

THIS process, as described by Dr. Neuhuss in his paper read recently before the Royal Photographic Society, is not beyond criticism.

The first statement to which exception can be taken is the following: "Amongst the various abortive systems founded upon it (the Young-Helmholtz theory of colour vision) the most notable was that of Ducos du Hauron, who in 1878 prepared papers covered, respectively, with yellow, blue, and red sensitive gelatine. When such papers were used as positives, the portion of the gelatine submitted to exposure became more or less insoluble according to the greater or lesser degree of transparency. The soluble parts were then washed out by water, and there remained on each paper what may be called a gelatine stencil. The three stencils were then superposed and produced a picture in colours. But the operation, successful as it was as a curiosity, offered no value, because the colours never came out correctly; and, secondly, the stencils were so fragile that it was almost an impossibility to superpose them twice in succession."

In 1867 C. Cross took out a patent for producing heliocromes, and used a red, a yellow, and a blue glass, through which to take the negatives and the results could be either used for printing in the complementary colours, or positives could be made from them in the same or the complementary colours, and observed in a zoetrope. (*Bull. Soc. Franç.*, 1869, Paris, p. 188.)

Ducos du Hauron also patented a process in 1868 (Patented November 23, No. 83,061), in which he took the negatives through orange, green and violet glasses, and printed the positives in their complementary colours, red, yellow, and blue, by means of bichromated gelatine coated on mica, and the pictures were then superimposed.

The next to appear upon the scene is Mr. F. E. Ives, and in a book published by him in Philadelphia, U.S.A., entitled *A New Principle in Heliochromy*, pp. 8 and 9, the following passage occurs: "It is, however, evidently desirable that the process be extended to the production of fixed pictures on paper and glass, and this extension involves some further complications. Pigment prints must be made from the heliochromic negatives, and, inasmuch as the mixture of pigments adds shade to shade instead of light to light, pigments must be used the colours of which are complementary to those rays of the spectrum which represent the primary colour sensations. These pigments do not show curves of absorption corresponding to the curves of intensity in the heliochrome negatives of the spectrum, but similar curves with the highest parts removed to those parts of the spectrum which most exclusively affect the corresponding sets of nerve fibrils. Such colours are Prussian blue, eosine red, and brilliant yellow. Prints properly made in these colours, blue from the negative of the red colour sensation, red from the negative representing the green colour sensation, and yellow from the negative representing the blue colour sensation—when superimposed on a white surface show the light, and shade, and colours of the object photographed almost as perfectly as the triple lantern projections. There is yet much to be done in perfecting the print-making part of the process. For the present, I am satisfied to obtain perfect heliochromic prints on glass, so that the results may be shown with the optical lantern, and have adopted the following procedure: The blue print is made by the cyanotype process in a film of gelatine attached to glass. The red print is made by the so-called carbon process, with eosine for the colouring matter, a reversed print being thereby produced upon another glass. The yellow print is made by the collotype printing process, on a specially prepared film of collodion and gelatine. Several of the red and yellow prints are made, and such prints selected as are found to produce a neutral black in the shadows when superimposed, with the blue print, over a white surface. The colours are then correct in every shade of the picture. After placing the yellow film picture between the blue and red picture on glass, and therefore in contact with them, they are moved until the images are exactly superimposed, and then fastened together by binding, to complete the lantern-slide heliochrome."

In Vol. XXXVIII. of THE BRITISH JOURNAL OF PHOTOGRAPHY, January 23, February 13, 20, and 27, 1891, appears a paper, read by Mr. Ives before the Franklin Institute, in which he enters most fully into the theory of the three-colour projection, and it is not therefore necessary for me to abstract from it, but to refer all for comparison of this and Dr. Selle's process and theories to that volume.

On May 25, 1892, Mr. Ives read a paper before the Society of Arts, in which he again pointed out the essentials for the making of superposed transparencies, and named the dyes with which these transparencies could be dyed, and in the Journal of the Camera Club, March 8, 1894, he further described the production of these superimposed transparencies, and suggested the use of bichromated gelatine films on clear celluloid, and also showed some results which struck me, as far as one can speak from memory, as truer to nature than those shown the other night at Hanover-square.

The next paragraph to which we may add a note is the following: "The positives are made on very thin films of chromated gelatine on a collodion substratum," &c.

E. Dumoulin, in his little work, *Les Couleurs reproduites en Photographie*, published in 1894, pp. 46 and 47, describes the use of collodion for transferring the three-coloured positives, though, in this case, the collodion was afterwards dissolved, but Cros and Carpenter described, in

Comptes Rendus, the use of an albumen film on collodion for the same purpose.

In connexion with the remark that Dr. Selle had discovered "a comparatively simple way of determining the complementary colour to any shades without the assistance of the spectroscope," it may be pointed out that this can be done in various ways. Assuming in the first place that the colours are pigmentary, it is quite possible to find a complementary colour with a piece of plate glass only, as was used by Lambert and Helmholtz, and which can be thus described: Take a piece of board, painted black, black cloth or paper, and just above its centre, about ten inches, support in a Wolff's or other convenient, stand a piece of plate glass about four inches square, at right angles to the board. If now two pieces of paper, coated with pigment, be placed at equal distance on either side of the centre, and one be looked at through the glass, the other will be seen by reflection, and the two tints will mingle.

If the colours are transparent, such as solutions of aniline dyes or stained gelatine or glass, then we may use Dove's dichroëscope, which is a small rectangular box with the top and back removed, or holes should be cut in the same. Inside the box should be placed about six sheets of best thin patent plate, and in front of the box should also be cut a small aperture. The method of using this is very simple, one of the colours is placed over the aperture in the back of the box, and viewed by transmitted light through the bundle of glass, whilst the other is placed on the top of the box and viewed by reflected light from the glass; the result is a perfect mixture if viewed by a Nicol prism, but, if the latter be not used, it is with some people more difficult to see the true mixture, the resultant compound light being confused.

Then, again, we can easily, and possibly most satisfactorily, determine complementary colours by using Maxwell's disc, a device which it is not necessary to describe; or we may use Dove's achromatic calc spar prism, and this is by far the simplest, if it can be obtained commercially. Dove's prism is a prism of calc spar, and a prism of glass which duplicates the images of an object, and by means of which the images of two objects can be made to combine. Possibly it may not be out of place to define "complementary," and any two colours which when combined will give white are complementary; but, it must not be forgotten that, in dealing with pigments, as a rule, a grey, and not pure white, is produced.

From the foregoing remarks, although I may be stigmatised as a hypercritic, yet I can hardly endorse the statement of Dr. Neuhauss "that in the main his (Selle's) process is an original invention.

A. D. Pretzl.

A NOTE ON REFRACTION AND DISPERSION.

[Read before the London and Provincial Photographic Association.]

When a ray of light falls upon a lens, which for our immediate object we will assume to be a simple one of convex form, it gives rise to the phenomena of refraction and dispersion. In accordance with the well-known law of prismatic refraction, by virtue of which light incident upon a prism is upon emergence refracted towards the base or thicker part of that prism, so a lens, which may be considered a series of prisms, also refracts or bends an incident ray towards its thicker part—this in a convex lens, being, of course, at its centre, while in a concave lens it is at the margin. But, while the lens receives a perfectly homogeneous ray of light, it does not transmit it in that condition, but splits it up into its component parts, or, as it is more properly termed, disperses it, so that, if in the path of the emergent ray you place in a darkened room a suitable surface, you will obtain a bright image of the spectrum.

I do not apologise for starting with these very elementary optical truths, because they form, as it were, the groundwork of all that follows. Indeed, the phenomena of refraction and dispersion of optical glass constitute, so to speak, the key to the construction of photographic lenses.

Refraction.

The refractive power of glass is determined by its density: the denser the material the more highly does it refract light. This may be expressed in another, and perhaps more photographic way, by stating that

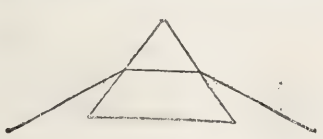


Fig. 1.

the denser the glass the more does it shorten the focus of the rays it transmits. The reverse of this also obtains, the lighter the glass the longer becomes its focus; hence it will be apparent that, independently of other considerations, the foci of our lenses are, in a measure, determined by the density of the material of which they are made.

If we pursue the obvious analogy that exists between a prism and a simple lens, we shall the more clearly perceive the reason for the comparison that is so frequently made between them. Light incident upon the face of a prism is, upon emergence, bent or refracted towards its base (fig. 1).

It is easy, by graphic means, to demonstrate that a lens is simply a series of prisms, and to trace the course of a number of parallel rays through

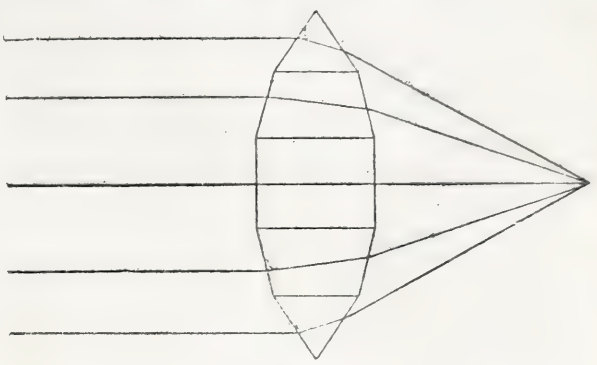


Fig. 2.

those prisms (fig. 2). It will be observed that rays entering the lens at points removed from its centre are, in reality, refracted towards the bases of a series of prisms, the whole of the rays finally meeting at a common focus at a point situated in the axis of the lens.

Dispersion.

But, when treating of the phenomenon of refraction *per se*, we assume that the light is monochromatic, or, in other words, that it is composed of a single homogeneous ray. This is, of course, not so in the case of solar light, with which we are now supposed to be dealing. The ray of light in its passage through our prism or lens does not by any means undergo what we may term homogeneous refraction; it is, as I have already observed, split up or dispersed into its component parts, each colour having a different degree of refrangibility to the other. This

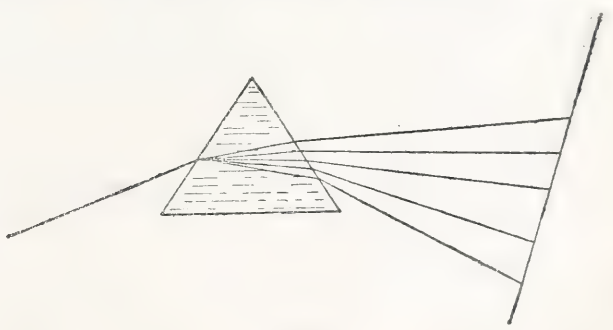


Fig. 3.

may be graphically illustrated by the well-known diagram which traces the dispersion of an incident ray at the moment it leaves the anterior surface of a lens or prism (fig. 3).

The phenomenon of the greater and less refrangibility of the rays of the spectrum is variously termed dispersion, chromatic dispersion, or chromatic aberration. Every lens formed of a single glass possesses it, and the reasons for its elimination, partial or complete, from our lenses are, of course, obvious to every photographer.

These preliminary considerations enable us now to approach the principles of achromatics as applied to photographic lenses. Just as glass varies in its refractive power, so does it vary in dispersion. Let us imagine the single lens we have been discussing to be of flint glass and of comparatively high dispersive power. It will transmit a series of coloured images along the path of its axis, the violet being the nearest to the lens, the red farthest off; but, if we unite to it a double concave lens of crown glass of lower dispersive power, the result will be to remove these images at a greater distance from the lens, so that the influence on the violet will be more powerful than on the red, and, by a proper system of correction and the selection of suitable glasses, the violet should finally be united to the red. But, if exactly the same kind of glass were used for both lenses, so that the dispersion caused by one were neutralised by the other, the curves would have to be such that the refraction of one would destroy that of the other, and therefore no image would be formed; but, by being able to use flint of a higher dispersive power than crown, it is possible to destroy the dispersion without destroying the refraction. The flint glass refracts more highly than the crown, and it is also more dispersive; but the relative difference of the dispersive powers is much greater than their refractive powers.

Some years ago Mr. Conrad Beck, in a paper read before the Society of Arts, put this point of the relations which the refractive and dispersive powers of glasses should bear to each other in the achromatisation of lenses in a clearer and more instructive manner than I have met with in any similar paper, so that I may be allowed to quote his remarks :—

"The amount of the difference between the refraction of the extreme colours when passing through a lens is called the dispersion of that glass. Glasses can be made which have different refractive powers, and with the difference of the refracting power the dispersion generally varies. If the dispersion of these glasses were always in the same proportion to their refractive power, it would be impossible to correct for this aberration, for suppose we have a convex lens which has a dispersion one-tenth that of its refracting power—by which I mean that, if if brings the violet portion of a bundle of rays to a point nine inches from the lens, it will bring the red portion to a point *ten* inches from the lens—and suppose we place a concave lens in front of this convex lens, which will give us exactly the same difference in the refraction of the different colours (*but* being concave it will be in an opposite direction), then, if the amount of the dispersion of this glass is also one-tenth of its refraction, we shall, in order to neutralise the dispersion of the convex lens, require a concave lens of exactly the same focus, and shall also neutralise the refractive powers of the combined pair, and the compound lens will then simply be plain glass. Glasses can be made which have different degrees of dispersion in comparison with their refractive power. If, then, we make our convex lens of a glass that has a dispersion only one-tenth of its refractive power, and make our convex lens from the glass which has the higher dispersion equal to one-fifth of its refraction, we shall find that the latter will only require to be half as powerful in order to correct the dispersion of the original lens, and, although it will be neutralised by one-half the original refraction, there will still be left remaining a power equal to half that of the convex lens. Thus, for the correction of chromatic aberration, it is important to note that the only essential condition is that the foci of the two lenses should be proportional to the relative dispersion. If one glass has a dispersion of one-tenth of its refraction, and the second glass has a dispersion one-fifth of its refraction, and if we make a positive or magnifying lens out of the first glass and a negative or diminishing lens out of the second glass, provided that the first lens has a refractive power double that of the second, the chromatic aberration will be corrected, no matter what the shape of the lenses; and it is evident that, by altering the curves of the lens, but always having the same balance between the two curves, either of the lenses may be made in many different shapes and yet give the focus required. Thus the correction for achromatism depends, not upon the shape of the lens, but on the foci of the two component lenses; while the correction for spherical aberration depends, not upon the foci, but upon their relative shape. There is, therefore, no difficulty in correcting for both spherical and chromatic aberration in the same pair of lenses."

Having now dealt in outline with the principles of achromatising a lens, it may be said that the application of those principles should produce a theoretically and practically perfect result. But there is a serious obstacle to the attainment of that object. If we can imagine that a prism or lens made of crown glass has its spectrum projected on to a screen, and immediately above or below it a flint glass prism or lens has *its* spectrum also projected so that the two bands coincide, it might be supposed that the individual colours also coincided—a condition of perfect

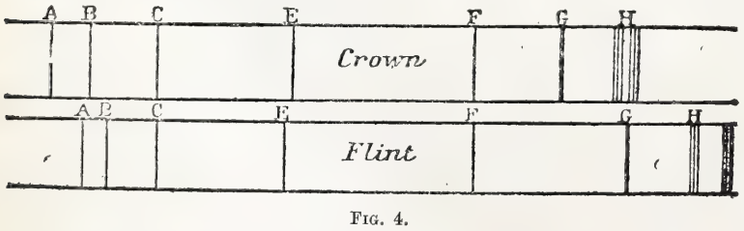


Fig. 4.

achromatism. But this is not so (fig. 4). The total lengths of the two spectra are equal, but the lines do not at all coincide—the parts between C and F, that is from the orange to the blue, are equal, but in the flint the parts between A and C, from the red to the orange, are shorter than in the case of the crown, but longer between F and G, that is, the blue-violet.

It will be apparent, therefore, that perfect achromatism in such glasses cannot be obtained, and that there will be a residuum of colour. This residuum of colour is termed the secondary spectrum. Now, as with ordinary flint and crown it is impossible to unite more than two colours, the yellow and violet are selected for the purpose of correcting photographic lenses, so that they shall transmit photographically sharp images.

It is sometimes doubted whether the secondary spectrum, that is, the colour which remains through the inability of ordinary flint and crown glasses to unite more than two colours of the spectrum to a common focus exercises any ill effects on a photographic lens. It may be interesting, therefore, to quote Gundlach, a practical American optician, on this point. He says: "If the spectra of the two glasses used in the construction of the objective were coincident, then the latter, if properly corrected, would unite all the colours of the spectrum to a common focus, and the secondary spectrum would be an unknown phenomenon, and consequently not only the visual and actinic foci would be perfectly identical, but also the whole amount of light passing through the lens would form a common sharp focus and an increased rapidity, aside from perfect sharpness of the picture, would result. But the secondary spectrum permits only two colours to be united, and, although the two colours most favourable to photography are selected, the rest of the spectrum is not only lost for co-activity in the production of the picture, but, because of its being more or less out of focus, is even injurious to the same." Theoretically, therefore, according to this authority, the highest type of defining power is not obtainable in lenses formed of the old flint and crown, but it is right to point out that authorities generally are not agreed upon the point. On the other hand, it would seem desirable that, for perfection of results in three-colour work and possibly orthochromatism, an apochromatic or colour-free lens should be employed. This I suggest as a topic upon which the opinions of those most qualified to judge might be given.

It is, however, probably near the mark to assume that the comparatively low indices of refraction of the older glasses, and the disproportionality of their dispersive properties rendered impracticable of achievement the concentration in one lens of great flatness of field, freedom from astigmatism, and large angular aperture, three properties inseparable from the nature of the glass, and not hitherto simultaneously realisable. But these properties are now found in many lenses which are made of what are popularly called the new glasses.

If we briefly glance at the refractive and dispersive properties of one or two of these new glasses, we shall perhaps be able to appreciate the influence of those properties in the construction of lenses. An instructive comparison of the old with the new glasses may be made in the following simple manner (fig. 5):—

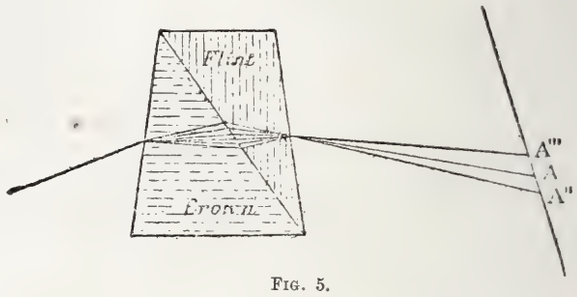


Fig. 5.

Let us take four prisms, grouped in pairs, as indicated by the diagram, the first pair being formed of English hard crown conjoined to soft flint, and the other pair formed of a borophosphate crown with a borate flnt (both Jena glasses), and suppose that the angles of the prisms are such that the various spectra have the same length between C and F. Assuming, therefore, the remainder of the spectra to be coincident, and violet and red rays to pass through the prisms, the violet falls at A''', while the red arrives at A''. Consider, now, that the prisms made of the phosphate crown and borate also pass the rays. The result is seen in the compensation of the spectrum of the one prism by that of the other, and the non-dispersed rays come to a focus at A.

Now, harking back to our diagram of the spectra of English flint and crown, you will see the difference in the dispersive powers of the old and new materials; the new glasses enable them to be coincident between A and G instead of only between C and F.

This little experiment, which is due to Dr. Miethe, whose valuable work on Photographic Optics also suggests some of the other illustrations, demonstrates, in fact, that power of the new glasses to bring to focus parts of the spectrum which the old glasses do not possess.

It is the elasticity and range of power, so to say, of the new glasses which enable corrections to be made that were not before possible. Dr. Rudolph, some years ago, laid it down that, for the production of anastigmatic flat-fielded lenses, it was necessary to have at hand a series of glasses in which any refractive index could be coupled with a desired dispersion. These glasses are now at the command of the optician, and thus, being able to combine high refraction with low dispersion, and low refraction with high dispersion, to impart to corrected compounds opposite degrees of refractiveness, and, so to say, ring the changes on the position of the negative and positive elements in corrected triplet and other combinations, we, theoretically at any rate, obtain lenses of greater optical perfection than hitherto.

Thomas Bedding.

ON RIPENING.

[Translated from the Photographisches Correspondenz.]

It is a well-known fact that a bromide of silver emulsion is considerably raised in sensitiveness by keeping for some time in a warm condition. Simultaneously it becomes coarser in the grain. This arises from the single molecules of bromide of silver forming themselves into larger aggregates. The process is called ripening.

A similar ripening is perceptible in the preparation of the combined

toning and fixing bath, if the hyposulphite of soda is added to a substance of acid reaction—for instance, alum. The mixture remains for a time clear. It then grows in turbidity by the presence of extremely fine particles of white sulphur. These are so fine that they will pass through filter paper. Only after a lapse of several days does the sulphur become so ripened that it settles.

At first there was an inclination to believe that the reaction of the two substances was very slow; that nitrate of silver could remain for a time in solution with bromide of potassium without forming bromide of silver, and that the acid left the hyposulphite of soda for a time unchanged; but, from experiments relating to the electrical conductivity of bromide of silver emulsion (Cohen) and the acid fixing bath (Fousseau), it is shown that the double decomposition is completely effected at once. The whole of the bromide of silver and the whole of the sulphur are produced immediately.

The sulphur just formed remains a short time in the atomic condition. Not till later does it assume the normal condition, by the atoms forming molecules, and these in turn larger aggregations of molecules.

The sulphur at first is actually dissolved in the fluid, although normal (ripened) sulphur is insoluble in it. In Carey Lea's soluble modification of silver we have a similar case of unripened metal, in the atomic or molecular condition, whilst the normal silver consists of larger molecular aggregations.

It has hitherto remained unnoticed that there is also a like "nascent state" for compounds.

In the presence of gelatine, for instance, the molecular condition may last for some time.

Ripening is a quite analogous process to crystallisation. This also depends upon the attraction of molecules into larger aggregations. *Nevertheless, this amorphous crystallisation of the molecular physicists has not been kept in view.*

We have mentioned that ripening is considerably delayed in a solution of gelatine, and especially in a jelly. By this means it is possible to investigate the properties of nascent elements and salts. This study is, therefore, of interest to photography, because a large number of the processes of the art must occur in jellies.

It is evident that, in the ripening of amorphous substances, much is analogous to what has been observed in crystallisation.

As a crystal forms in a supersaturated solution, it is surrounded by a zone of solution of less saturation. The molecules of salt by simple diffusion flow from the environment to the border of this zone, to be then attracted with increased velocity to the crystal. These zones are very distinct, if the solution of the salt is spread in a very thin layer upon a glass plate. For instance, bichromate of potash will thus show arborescent structures. The appearance is as though the crystals had repelled each other; but this is simply owing to the formation of the zones devoid of, or poor in, salt.

A crystal (aggregation of molecules) consequently attracts from its surroundings the unripened molecules. A zone is formed in the same manner around a nascent aggregation of chloride of silver.

Place a drop of silver nitrate solution (about fifty per cent.) upon a glass plate coated with gelatine containing chloride of sodium. The silver solution penetrates the jelly and clouds it with chloride of silver. This cloud spreads in circular form, laterally, in the film. If the whole surface of the plate, some time afterwards, is brushed with silver nitrate solution, a zone several millimetres broad, surrounding the first circle of silver chloride, will remain perfectly clear. Beyond this the chloride of silver is formed normally. This proves that there is a zone free from salt surrounding the circle of diffusion.

I thought at first that the chloride of sodium was attracted by the nitrate of silver (see pamphlet "Chemische Fernwirkung"). Further experiments, however, proved that this was only a secondary action. The silver nitrate has advanced as far as the zone extends, and has for the most part combined with the chloride of sodium. The chloride of silver in formation, which is still in solution in the molecular state, is then attracted by that which has already been formed, and then ripens upon it. Its path, therefore, is centripetal.

The nitrate of silver travels still more quickly if the zone deficient in salt (often more than half a centimetre broad) touches the edge of the plate. This salt is able to travel quicker and farther in a jelly poor in chloride of sodium than in a rich one.

A drop of silver nitrate placed upon a jelly consisting of—

Water	200 grains,
Gelatine	10 ,,
Chloride of sodium	2 ,,

produces a circle of chloride of silver twice as large as upon a jelly consisting of—

Water	200 grains.
Gelatine	10 ,,
Chloride of sodium	4 ,,

At that part between the edge and the circle of silver chloride, the chloride of sodium cannot diffuse itself as it does elsewhere. The deficiency of chloride of sodium can also be recognised by the lesser density of the cloudiness due to the chloride of silver. Finally, a space remains perfectly clear between the edge of the plate and the circle of silver chloride, which is proved to be quite free from chlorine by subsequently touching it with nitrate of silver solution.

The acceleration of the growth is shown more distinctly if a second circle of silver chloride is formed in the neighbourhood of the first. Both spread in regular circles at first; but, as soon as the zones meet, the chloride of silver grows much more quickly at the line of juncture. Before the tips of both masses of silver chloride completely touch (underlying which seems to be chemical action at a distance), an indentation appears in each, similar to the crater in the positive pole of an arc light. Upon contact, these two indentations form a circular spot, which remains perfectly clear. It is the last portion of the zone which is quite free from chlorine.

The formation of the zone can be observed directly by using coloured salts. For instance, if two drops of a solution of sulphate of copper are placed upon a jelly mixed with potassium ferrocyanide, although the film at first was of a uniform yellow, the colour disappears around the circles of ferridcyanide of copper. As soon as the zones touch, the attraction also begins at these circles.

Similar zones may also be observed at times with physically developed images. This also is an instance of the action of a nascent substance, metallic silver. I have often seen small white margins to the deepest shadows in the development of slightly printed pictures on gelatino chloride of silver (*Photographisches Archiv*, 1895, p. 158). This nearly always occurred when the dish had remained stationary, when consequently the diffusion of the developer had not been increased artificially. These zones showed themselves regularly when diffusion was still further diminished, as in taking prints from the bath and hanging them up still wet with developer. The attraction of the atomic, or molecular silver from its surroundings is also perceptible in the formation of negative images upon two chloride of silver prints allowed to remain at rest in the developer, in contact with each other. The ripened silver of the one sheet is able to abstract the less ripened silver from the other.

It is important for the theory of solarisation that, on the side of the zone which was originally white, a very intense blackening may occur. After brushing over the whole plate with silver nitrate, one sees that the circles of nascent chloride of silver have at the extreme border of the zone, deficient in chlorine, a small band that is richer in chlorine than the environs.

It is also well to note that zones of this description are not to be confused with those produced by a mixture of two substances. Allow, for example, a drop of a solution of commercial chloride of iron, which usually contains free hydrochloric acid, to penetrate a jelly of pure gelatine. The hydrochloric acid always travels much in advance of the iron salt. Similarly the secondary product of decomposition, formed by the action of silver nitrate upon sodium chloride, namely, nitrate of soda, may travel in advance, and thus influence somewhat the processes we have described.

The nascent state lasts a considerable time when streams of diffusion of silver nitrate and bichromate of potash meet in a pure jelly. Both circles may penetrate each other to the depth of a centimetre without the formation of the characteristic brown red precipitate of silver bichromate becoming visible. At last a point of normal (*i.e.* ripened) silver bichromate appears in the centre of this apparently reactionless mass. This does not spread itself out in a homogeneous surface, but, in consequence of the slow ripening, most remarkable lines are formed. The attraction of the salt from its environs is also characteristic, as shown by the clear spaces intervening. The arrangement of these rows of lines is different, according to the relative concentration of both solutions of the salts.

Another experiment may be made which will render the character of these lines more comprehensible. If we place a drop of nitrate of silver solution upon a jelly containing bichromate of potash, the bichromate of silver is not formed in a homogeneous circle, but spread out in concentric waves, like those formed by a stone thrown into the water. The arrangement still more closely resembles the structure of the transverse section of the trunk of a tree. In the centre, where the drop originally stood, we see the pith. Around this is the wood, with its annulations. Then follows the ring of cambium, and finally the bark. Some other striking analogies between both might be made; for instance, the radiations of the pith which traverse the rings of the wood, and which are filled with the texture of the layer of cambium.

As indicated by the name, the growth of the concentric yearly rings of the tree trunk follows regularly the alternation of summer and winter. By this analogy one might be misled to the opinion, that in chemical solutions the reaction was not continuous, but rhythmical. This would be of the highest importance to molecular physics; but various circumstances make it appear very unlikely. Bütschli, for instance, has seen the formation of similar structures, in watching certain salts under the microscope, as they crystallised in thin layers upon glass. These are only ripening processes, which, by retardation, have become rhythmic.

I will not enter into further particulars here. It has simply been my wish to show that molecular processes often take place under very different conditions in jellies than in plain solutions. This must be taken into consideration in photographic physics.

R. Ed. Liesegang.

THE PICTORIAL POSSIBILITIES OF THE HAND CAMERA.

Surrounded by a surging crowd of curious sightseers, patiently awaiting the arrival of the Corpus Domini procession which I wish to photograph, one sentence comes to my ears, clear and distinct, from the great diapason of sound emanating from a thousand throats:—*è una di quelle macchine istantanee colle quali i dilettanti si divertono.* It is the expression of the popular opinion of my hand camera—the "instantaneous machine with which amateurs amuse themselves." It sets me thinking.

In all ages, and in every clime, the voice of the people has ever been regarded as the infallible monition of divinity. If it be so invariably, I must recant ancient heresies, and return to a right way of thinking according to the popular standard, for, a lustrum back, I had sustained the contention that in the hand camera lay the future artistic—hateful word—salvation of photography; and, though the fleeting years produced enough to shake my faith, they brought also, occasionally, satisfactory confirmation of my views. I had seen a worker emerge from obscurity and in a single season, rise to the foremost ranks by means of the hand camera, and I had augured the happiest results from the exampie set. Although the germ was minute, I had faith in time and that which shapes it to a perfect end. But have I been deceived in my hopes, and is the hand camera nothing more than an instantaneous machine for the amusement of amateurs? or is the tradition for ever wrong, and the popular voice nothing more than an empty sound when it speaks on technical subjects?

Obviously, the primary step in any inquiry for the elucidation of the question must be the determination of the origin of the vulgar belief; for, if the general impression be found to be based on insufficient premises, it will be hardly necessary to pursue that side of the investigation further, and, with the ground cleared, the solution of the other thesis will be rendered easier. Fortunately, it is comparatively easy to trace to its source the popular verdict. It cannot be that the conviction has risen appreciably from the extensive use of the hand camera by amateurs, as then any occupation in life shared largely by a community would necessarily be regarded by the masses as an amusement and nothing more. In that case the commonalty would hold that the members of the wealthy and leisured classes who, without compulsion and with no hope of pecuniary profit, devote both time and money to their country's affairs, are influenced by nothing higher than a desire for relaxation—which, as Euclid says, is absurd. Nor can it be the photographic outturn that has given birth to the current opinion, for, generally speaking, the only means open to the million of becoming acquainted with hand-camera work is afforded by exhibitions, and at all such shows, conducted in a proper spirit, the element of amusement does not make itself conspicuous. There remains now for consideration only one more source of information, Is there anything in the lay press—unhappily, the public know nothing of the technical journals—that can have fostered the common sentiment? I have before me as I write, two daily newspapers, received in ordinary course this morning, and in each the most conspicuous advertisements refer to hand cameras. They remind me forcibly of the remark of a friend, a renowned painter, now no more. We were walking through the rooms of a photographic Exhibition, having a preliminary view of the pictures being hung, when suddenly, turning to me, he directed attention to the vulgarity of one of the exhibits. "Is it not strange," he observed, "how, despite all technical restrictions, the innate coarseness of a man makes itself evident in his works? They say that photography is a mere mechanical process, in which the spirit of the artist can never express itself; but, between you and me, I vow I can gauge the culture of any photographer from his prints." Whether he over-estimated his perspicacity, I shall not attempt to decide, but it does not need extraordinary discernment to perceive the intensity of the vulgarity of the draftsmen employed by the camera vendors to recommend their production to the public. In one of the representations of the hand camera in use, a cad is shown lurking round a street corner, expectantly waiting to snap-shoot a pair of women advancing towards him. In the other, the same cad—or perhaps his brother—is shown seated by the seaside, sucking at an enormous cigar, while a flashily dressed female "takes" him in all his gaudy glory. Now, such productions as these are really the sources of outside public opinion. They address the proletariat in a language "understanded of the people," and, possibly, they induce some of the multitude to ape the doings of the figured workers. But do they really convey a correct version of facts? It would be an insult to our education and training to assume even for a moment that they did.

This lengthy preamble has cleared the way for an exposition of my doctrine, that the æsthetic redemption of photography will be effected through the hand camera. Stand photography has struggled for over half a century to be considered an art, and, whatever we may say in our hearts, we must admit that it has not yet quite succeeded in establishing its claim. Much, very much, has been done for the adequate and truthful representation of Nature, but, with few exceptions, the best has just fallen short of that ideal achieved by our brethren of the brush. We have attained the level of the lay figure, but have seldom shared Pygmalion's joy in infusing soul into our works. I am aware that I am exposing myself to much abuse by these statements, but I care nothing for the angry hissing of photographing geese. I seek only the truth, and demand whether there is not almost always in our best productions something wanting that would raise them to the level of high art? That the want has been felt is evident from the groping after light by those who have sought the æsthetic elevation of photography. Emerson believed for a while that he had found the thing wanting in Naturalism, while others think it is involved in fuzzyism and feeble imitations of impressionist painters. Where so many good men have failed in determining what that something is, I fear to advance, but, it seems to me, that we have not succeeded because our works lack spontaneity and felicity in the delivery of our pictorial message. Setting aside, for the present, all the nauseatingly glib commonplaces that pass with us for "art" teaching, and are good enough for frivolling when nothing serious is under consideration, let us come to a clear understanding as to the object of all great pictorial works. Is it not to convey a message which will address itself to the higher sentiment and moral power of the spectator, thrilling the affections and the emotions both of the intellect and of the will, as with harp strings? If this proposition be admitted, how has stand photography attained the pictorial ideal?

A moment's consideration of our premises will throw out of court pure and simple photographs of land and seascapes. However skilful the selection and the grouping of the various items, the transcripts, lacking the great glory of colour, can never convey a noble message, can never adequately express the delight of man in the works of the Creator. That this is so will be conceded if the secret of the pleasurable feeling evoked by representations of dawn and twilight effects be unravelled. It is solely because, at the birth and death of day, nature is comparatively devoid of colour that their pictured photographic presentiments have touched the high-water mark of pure landscape photography. That photography reaches the ideal only in subjects independent of colour, is a fact it will be well to recognise. By the introduction of figures into landscapes and indoor scenes, a loftier theme is attempted; but, although the story to be told may find fit expression in monochrome very, very seldom has conception been followed by tuition. The delineations almost always lack spontaneity. They convey much the same impression as do stuffed animals. And that this will always be so must be evident from the fact that, in stand photography, the grouping and posing are necessarily artificial. Under such conditions, the message will depend on a clever bit of acting and the lens will reveal the truth. If a story is to be told naturally, Nature alone must arrange her materials, and decide the manner in which the relation is to be effected. This conclusion is certainly logical, and, if admitted, it will preclude the employment of aught save hand cameras.

Of ccurse, the hand camera must be used with discretion, and not in the fashion affected by tripod workers. Generalities of every sort must be shunned as the source of all evil, and the attention confined to objects in the foreground, taking in only those that help out the story to be told. Herein lies the essential discriminating principle to be observed if our salvation is to be worked out. This very week I was afforded an illustration of the inutility of the stand camera for some of the many pathetic scenes that abound on every side. At the foot of the steps leading to the entrance of one of the great churches, with which this city of Naples is so plentifully stocked, were collected some half-dozen male and female paupers. A steady swollen stream of passengers passed by, brushing against them, but seeing them not. In the front sat, with downcast face, an aged man broken by the storm and stress of life. A step higher slept a woman, clothed in unwomanly rags, but whose features showed that, whatever her present fortune, at one time she must have been the object of a strong man's love. Still higher sat a young mother, shielding from the icy blast a little morsel of humanity and giving from her withered breast the nourishment denied to herself by the great world. In our Father's house there are many mansions, but on earth only the stony threshold of His tabernacle is open to some of His children. As I said before, the hurrying crowd passed by unmindful, for there was none to touch in them the springs of that charity that is synonymous with love. Tripod photography was under the conditions a sheer impossibility, but the hand camera could, and did, give expression to the message the

scene conveyed. Farther on, my attention was arrested by one of the saddest sights I have ever seen. In one of the show windows of a restaurant, protected from the public by a great sheet of plate glass, was arranged a tempting show of culinary dainties, and in the street outside, eyeing them wolfishly, were a woman, pinched with hunger, and a kneeling child to whom life had hitherto only spelt want. Here, again, was the mute mandate of love, and the hand camera registered it.

It may be urged that my illustrations are not felicitous; that, being based on misery, they are incompatible with that sense of pleasure which true art should always convey. Alas! in this world, misery is utterly disproportionate to the joys, and I have described only a tithe of the sad scenes witnessed in one morning. Our gladness is, in fact, so interwoven with our sorrows, that without the one the other cannot be appreciated. Sooner or later we come to know that the salt tears we shed savour our happiness. But, in suggesting two of the lurid incidents of life as fit subjects for the hand camera, have I really offended any of the canons of taste? The representation of human woe may or may not be painful, according as the manifest purpose is simply the delineation of distress or an appeal to the emotions. For instance, a snap-shot of a funeral party of weeping women would be a gross outrage, for the purpose would rise no higher than the simple representation of the gaping wounds in the hearts of others. But suppose the scene represented a catafalque preceded by a procession of acolytes bearing aloft great brazen candles and crucifixes, and sandalled monks chanting the *De Profundis*. Would not the cerements be forgotten in the involuntary cry, "Requiem æternam dona ei, Domine," and would not the message be one pointing to the brevity of life?

If, however, only scenes of sunshine be desired, though rarer than those of suffering, yet they are plentiful enough. One such I witnessed after the incidents described above. It was in a poor neighbourhood, and the denizens were not dressed with that regard for warmth that the season required. But the ragged children rejoiced, and danced in a captivating, light-hearted fashion to the strains of a wheezy barrel organ. Backwards and forwards they swayed, and then, joining hands in a fairy ring, they gyrated with a rapidity that made the brain reel. Could there be a better exemplification of the joy of life? Thousands of such scenes lie on every side awaiting the hand camera. We have not to wait patiently an angelic stirring of the source of inspiration. Every moment the great page of life is being unrolled, and the significance of its teachings is only commensurate with the seeker's susceptibility to impression. Let those who would instruct and elevate their fellows train themselves fully to assimilate the noblest monitions of Nature, and then, camera in hand, communicate the glad tidings to the outer world. Our public is ready, and its capacity great; and our claim to be considered an art will be admitted only when we recognise our chance and the great pictorial possibilities of the hand camera.

GEORGE EWING.

APPARATUS FOR EXAMINING AND DISPLAYING TRANSPARENT PHOTOGRAPHS: IRWIN'S IMPROVEMENTS.

MR. JOSHUA HYDE IRWIN says: "There is a certain amount of difficulty experienced, in ordinary circumstances, in judging of a photograph on a glass plate, when it is merely held up against the light, that is to say, in judging of its degree of density and as to the perfection of its detail; but for lantern slides, for instance, it is of much importance that very accurate definition should be obtained. To obviate this difficulty, it is common (and, in fact, for the display of such photographs in shop windows it is common) to place the glass plate, on which the photograph exists, between sky and a plate of looking-glass, which looking-glass is set at a convenient angle for reflection. By this means a more accurate definition of the picture is obtained.

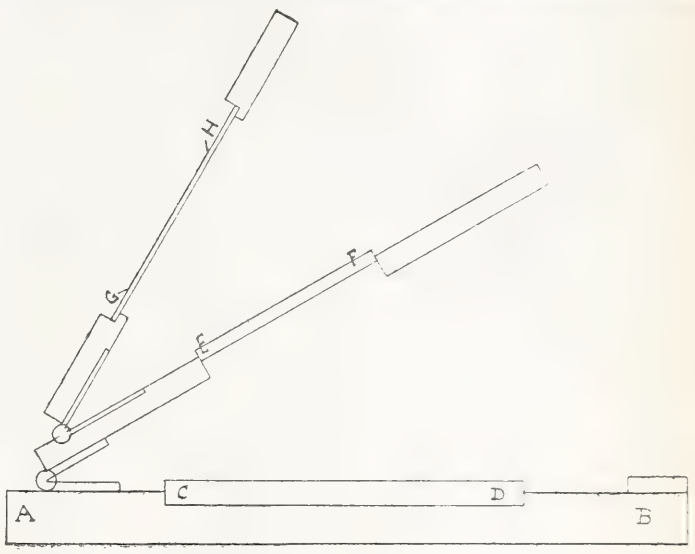
"I do not claim any part of this idea as my invention. It is in use, and it is moderately effectual in meeting the difficulty I have referred to; but I find that the definition so obtained is much less perfect than it is made by my invention.

"I construct a frame with a piece of good looking-glass in its base. At one end of this frame I hinge a shelf, which can be lifted up on its hinges, and supported in the desired position (that is to say, at the proper angle) by a crutch falling into one of several notches cut on the base. In this shelf I cut an opening of nearly the size of the plate to be examined, but so much smaller as to prevent the plate from falling through, and there is a supporting piece at the lower end of this opening, to prevent the plate from slipping down, by reason of the slope of the shelf. When the picture is thus arranged, by turning the top side of the shelf to the source of light, an image is reflected from the looking-glass much more perfectly defined than if the photograph were merely looked at direct. The definition is, however, usually greatly short of that perfection which is obtained by my invention.

"By my invention I apply, between the source of light and the photograph, and so as nearly to touch the photograph, a diffusing arrangement, whereby the rays of light are broken up, and spread, as it were, uniformly over the whole picture, and by this means an exceedingly improved definition is secured.

"I use, for the purpose of diffusion, finely frosted or ground glass; and I prefer to fix it in a small frame, hinged to what I have called the shelf, so that, when the picture is in position, this glass, and its frame, may be turned over upon it, so as nearly to touch it. The diffuser may, however, be formed of certain kinds of tracing paper or tracing cloth; and I may use colourless or coloured diffusers, which latter, in certain circumstances, enhance the effect.

"It will be seen that the form in which my invention may be applied may vary within very wide limits, and as I do not claim any particular form of apparatus, and for the sake of clearness I illustrate the application



of my invention in skeleton outline. A B is a base plate, and C D a piece of looking-glass upon it; E F is the photograph on glass plate to be illuminated and defined, and G H the diffusing plate of frosted or ground glass, or tracing paper, or other suitable material, which can be shut down so as to be in contact with the photograph, or nearly so. This skeleton form is part of a box, with sides to prevent strong light falling on the looking-glass, excepting through the photograph. Rays of light falling on G H from any direction are broken up and deflected in all directions by the diffusing action of the plate, and spread, as it were, evenly upon the picture, and, although the source of light may be even at an acute angle to the picture, it is so deflected by the plate as practically to pass to the looking-glass at a right angle, and be thence reflected.

"Manifestly the apparatus may be also so constructed as to bring the eye of the observer into the position occupied by the plate of looking-glass, but I consider the glass more convenient."

The claim is for the use of a diffusing plate substantially as described for the purpose of obtaining more perfect illumination and definition of photographic pictures on glass.

COLOUR PHOTOGRAPHY: BAUMGARTNER'S IMPROVEMENTS.

MR. ALBERT BAUMGARTNER states that it has been already proposed to carry out the process of three-colour photographic reproduction by combining the three colours on one plate, putting them in the form of fine or delicate points or lines, forming in effect three-coloured mosaic. On the plate thus prepared bromide of silver emulsion is put, exposed to light from behind the plate, developed, and thus is obtained a coloured representation by one operation.

This process, however, has not been employed until now, because the manufacturing of fine-grained three-coloured plates offers great difficulty in the usual method of chromo-lithography.

The present process permits, however, of manufacturing such plates without particular technical difficulty, and allows, at the same time, of the employment of any number of colours.

The essential feature of this method is that colours are put on alternately by printing, and in a chemical way, in such a way that, by means of print and oil colour, an incoherent coloured coating graining is first given to the plate, and then the spots or places left uncoloured are afterwards coloured, by means of dyeing, corroding, or etching (like the manipulation in cotton printing), in which operation the colour does not adhere at the places previously printed with oil colour.

If, for instance, a sheet of celluloid is coated with gelatine, or a similar substance, and a red graining is printed on it from a granulated lithographic stone or zinc plate in oil colour, when this plate is dipped into

the solution of an aniline colour—for instance, blue-green—only those spots will take up the colour which have not been printed with the red oil colour.

When, again, a graining of yellow oil colour is printed on, which will partly fall over the red and partly over the blue, the result is orange and green; finally, the spots which are not covered by the yellow colour can be dyed still farther, as may be required.

It is obvious that, in choosing the correct colours, and repeating the process several times, many colours can be put on; also fixing of the colours under the influence of light, as in photographic pigment printing, may be done. If, for instance, on a sheet of celluloid a red and a yellow graining are printed, so that the two colours partly cover one another, and the sheet is then coated with a layer of blue gelatine which has been rendered sensitive to light by means of bichromate of potash, when it is exposed to light from behind, and developed in the usual pigment process, blue colour will be found on the spots which have remained free of oil colour, less will remain on the yellow spots, the result of which is green; on the red and orange spots, however, no blue colour will remain, by which means a similar effect will be produced as in the example first given.

One can also proceed in the following manner:—

Upon a celluloid sheet is printed a red-and-yellow granulation, so that the two colours fall partly over each other, then the sheet is coated with a layer of blue gelatine, which is made sensitive by means of bichromate of potash; it is exposed from behind, and developed as in the usual pigment process. On the places which remained white, blue will be fixed; on the yellows correspondingly less whereby green is produced, on the red and orange colouring nothing at all, whereby a similar effect is produced as in the first example.

Also here, of course, other colours, and in other succession, can be used.

If the layer is to be produced on glass, one prints upon a transferring paper, and the colour is taken over to the glass.

The claim is for the production of granulated variously coloured plates for photographic colour representation in such a manner that the colours are transferred by printing and dyeing alternately upon the surface, so that the dyeing is only effected on the places not yet covered by the mechanical printing.

PHOTOGRAPHING CLOUDS.

[American Journal of Photography.]

It will be difficult to name a class of landscape in which the sky is not the key-note, the standard of scale, and the chief organ of sentiment. The sky is the source of light in nature, and governs everything; even our common observations on the weather of every day are altogether suggested by it.

The difficulty of skies in painting is very great, both as to composition and execution, and the difficulty is considerable also in photography, which, I suppose, is the reason they are so often neglected in landscape, to the great injury of the composition. But the difficulties are not insurmountable, and it is possible to depict with the appliances of modern photography some of that constant play of exhaustless energy, evolving from its bosom form after form of loveliness—fleecy masses of wind-fretted clouds, soft filaments of fine-spun vapour, interpenetrated with changing lights, multitudes of dense white shapes wandering in thick flocks,

"Shepherded by the slow, unwilling wind."

The primal cause of the failure to secure these transient shapes of beauty is the great intensity of the light of the sky compared with the amount of illumination of the general landscape, or even of water. In a photograph the sky is often not as bright as the water or other high lights. To speak photographically, it is literally burned out. For the amount of exposure necessary to secure the landscape vastly overtimes the sky.

If only enough exposure be given to secure the sky the landscape is veiled in deep night, as the sky has the appearance of a moonlight expanse without any corresponding illumination of the scene as in a real moonlight view.

It is for this reason that various devices have been suggested to give the minimum amount of exposure to the sky and the maximum to the landscape, such as sky screens, shutters, &c., but these hardly better the condition of things, and recourse is generally had to the printing in of clouds from another negative, not always in harmony with the view, frequently illuminated in a different direction, and once in a while even upside down.

When films came into use, the writer hailed them as an effectual solution of the problem, and did secure some good results by exposing a film instantaneously with a small stop in the lens for the cloud effect, and on the same scene another film or plate for the landscape, to which more time was given, one side of the double holder containing the sky plate, the other the view plate. The sky negative could thus be used for double printing.

This method required much care and attention at the time of exposure, and subsequent care and attention both in development and printing; besides, even the films did not always secure the sky effect.

To get the best results in skying we must take into consideration the nature of the sky subject, and study it both as to the method of exposure and the mode of development to be applied. Clouds—by which we really mean the sky in photography—are divided into certain orders: cumulus, cirrus, stratus, &c., and combinations, each demanding a special treatment.

If we apply the method for cumulus to cirrus, we get nothing for our pains.

Cumulus does not require very special handling. An ordinary plate of the slow variety is preferred. Short exposure and a bromide developer will generally give us a counterfeit presentment of the heavenly countenance.

Some attention must also be paid to the character of the lens, according to the amount of sky we wish to take in. If considerable of heaven's canopy is desired, select a wide-angle, of course; but if we wish a single great luminous mass of wool-like vapour, "the lazy, pacing clouds," a lens of longer focus comes into play.

Stop down the lens, for even in conjunction with the most rapid shutter there is great danger of over-exposure. Even the storm cloud, though it looks dark to us, almost black sometimes, is surcharged with light, which is constantly radiating from it, and a very quick exposure is sufficient.

The most difficult clouds to secure are the feathery cirrus, and those forms we call mare's tails. The trouble is caused by the bright blue of the sky operating as powerfully as the clouds themselves, giving no contrast in the picture.

If our skies were constantly red or green, which, thank God, they are not, the securing of the fleecy veil would be easy enough. It has been suggested, and, I believe, tried, to make use of a Nicol prism, for, as you know, the blue of the sky is polarised light. The prism is placed in proper position before the lens, and we have what we desire, white cloud upon a black ground. But Nicol prisms are expensive. Cloud prospects have also been photographed successfully by placing a dark mirror in front of the lens at the angle of polarisation, and taking the view reflected therein.

But these plans are not sufficiently simple or the apparatus always accessible, and recourse is had to other methods which recommend themselves by their simplicity.

I hear several voices at once, "How about orthochromatic plates?" Possess yourselves in patience, dear readers; I am coming to that plan at a leap.

Take a plate stained with erythrosine, which is specially sensitive to the yellow-green rays, and expose through a proper filter, and we have the conditions presented to the plate by the light which passes through the lens and filter as if the clouds were on a dark ground.

Dr. R. Neuhauss, in an excellent monograph on cloud photography, published in Germany, gives the following formula for making erythrosine plates:—

STOCK SOLUTION OF ERYTHROSINE.

Erythrosine	15 grains.
Alcohol (95 per cent.)	1½ ounces.

For use take 3⅓ ounces of distilled water and ¾ drachm of stock solution of erythrosine, and filter it to remove any dust particles. The plate is bathed in this for a minute, rocked in two directions, so as to ensure uniformity, placed to drain on clean absorbent paper for ten minutes, and then dried in dark room.

The plate is exposed through a yellow screen, placed at the back of the lens. Dr. Neuhauss recommends the chromate of copper, which completely excludes the blue and violet rays. It is made as follows:—

Take sulphate of copper	678 grains.
Bichromate of potassa	66 grains.
Sulphuric acid	8 drops.
Water	8 to 16 ounces.

This fluid, which is of greater or less density according to the amount of water employed, is placed in a glass cell composed of two pieces of plate glass, and introduced behind the lens. If placed in front of the lens, the focussing must be done through it, or the image will be blurred on the plate.

The lightest cirrus can be secured by this means, but the time of exposure is, of course, longer than when photographing cumulus, by reason of the dark colour of the absorbing filter. Any of the developers can be employed; but, in order to secure proper contrast, recourse must be had to slow development, with plenty of bromide as restrainer.

Attention is sometimes needed to the position of the camera when the cloud masses, or single great clouds are towards the zenith rather than the horizon. Arrangements should be made to tilt the instrument almost vertically, for frequently splendid forms are presented directly overhead.

The extreme distance of some cloud varieties is often deceptive. To the eye they appear much larger in form than they look when focussed on the ground glass. Of course, we must change the objective to render

them larger. Indeed, it is strange that photography is not made more use of as a scientific adjunct for meteorological observation of the great variety of cloud forms. The present classification, based on ordinary observation, is very defective. The engravings in the books from hand drawings are imperfect, and exhibit but a few of the forms of nature.

There are many varieties which cannot be arranged under the present systems, especially the cloud forms presented at night, and the changes which so rapidly take place in all forms. These could all be secured and tabulated. The peculiar varieties at night, when the illumination is comparatively weak, of course, necessitates a quick lens and longer exposures, sometimes as much as a minute. Trouble is experienced in focussing on the night clouds, but may be overcome by striking a fixed focus by daylight on a point of farthest remove. The sky being black at night, an ordinary plate can be used, and the diaphragm should not be too small. If we know the focal length of our lens, the camera may be used to determine the angular distance and magnitude of the clouds, and the rate of movement estimated by fixed lines on the ground glass; but, as there are very accurate scientific instruments for this purpose, we only mention it as a hint to amateurs who take some delight in meteorological phenomena.

JOHN BARTLETT.

ROYAL PHOTOGRAPHIC SOCIETY.

ATTENDANCES OF MEMBERS OF COUNCIL FROM JANUARY 1 TO DECEMBER 8, 1896.

Meetings.	Name.	Attendances.	Meetings.	Name.	Attendances.
9	Capt. W. de W. Abney	7	10	W. E. Debenham	10
8	The Earl of Crawford	5	10	Col. J. Gale	2
10	T. R. Dallmeyer	9	10	T. C. Hepworth.....	2
10	J. W. Swan.....	7	7	E. Cecil Hertslet	6
10	Sir H. Trueman Wood	5	10	F. Hollyer	1
10	G. Scamell	10	10	Chapman Jones.....	10
10	Edgar Clifton.....	9	10	A. Mackie	7
9	Francis Ince	1	9	J. W. Marchant.....	9
10	T. Bedding	9	8	J. A. Sinclair	8
10	T. Bolas	9	10	J. Spiller.....	8
10	F. A. Bridge	7	10	E. J. Wall	9
10	J. Cadett.....	9	10	L. Warnerke	4
10	F. P. Cembrano, jun.	0	8	Paul L. Waterlow	3
10	A. Cowan	6	10	Horace Wilmer	7

Our Editorial Table.

THE VIVISCOPE.

J. W. L. Naish & Co., 12, Carnegie-street, Edinburgh, N.B.

THE Viviscope, which we describe at p. 867 of the ALMANAC, is a very interesting toy on the kinetoscopic principle. Supported on a standard is a circular stage, and concentric with the stage a circular block, about eight inches in diameter, which is rotated with a hand wheel. Endless bands of paper with coloured pictures of figures in progressive stages of movement, drawn on the zoetrope principle, the same as is followed in securing photographs for the kinetoscope and vitascope, fit loosely over a stationary cylinder and a depending block. The rotation of the hand wheel somewhat rapidly imparts the necessary movement. From the foregoing brief description it will be seen that the Viviscope allows of the inspection of "animated pictures" on the drawing-room table. It is a clever adaptation of the now familiar principles of persistence of vision to toy purposes. Furnished with a set of comical subjects, the amusement we were enabled to impart to several young people during the recent festivities convinces us that the Viviscope will be welcome and appreciated in many homes.

FINISHING IN BLACK, WHITE, AND MONOCHROME.

By A. H. BOOL. Published by the author, 93, Harwood-road, Fulham, S.W.

THE author writes with evident practical knowledge of his subject, and the directions he gives for working up bromide, platinum or carbon prints in black and white are clear and simple. The little pamphlet hardly contains a superfluous word, and we can recommend it to our readers as being likely to be of great help to them in acquiring a knowledge of how to produce good results in "finishing" and working up—a knowledge which observation shows us to be less general than it should be, but which it is none the less desirable that the photographer should possess.

THE PHOTOGRAPHER'S DIARY, 1897.

A USEFUL little diary for photographers is published jointly by Messrs. Charles Letts & Co., of Tabernacle-street and the Blackfriars Photographic Co., of Surrey-row, S.E. Besides spaces for entering daily memoranda, the volume gives a mass of notes on photographic matters, facilities for recording exposures, and other features likely to interest or instruct a photographer. The book is published at 1*s*.

THE PHOTOGRAPHER'S MINIATURE ANNUAL FOR 1897.

Edited by THOMAS BOLAS, F.C.S. London: Carter & Co., 5, Furnival-street.

THIS tiny annual goes comfortably into the waistcoat pocket. It consists of about fifty pp., 2½ inches by 2 inches, and is full of well-condensed information bearing upon photographic matters. We quote the following remarks on acetylene: "The use of acetylene as an illuminant has not made much headway. Not only does this material fail to offer any very substantial advantage over petroleum for the lantern and for photographic operations, but persons have become cautious because of the various explosions which have occurred, and which must be regarded as explosions of acetylene *per se*—that is, its sudden resolution into carbon and lower hydrocarbons having a greater volume." We think Mr. Bolas is wrong in stating that acetylene has not made much headway—although, of course, everything hinges on the construction of the word "much." As to the light offering no substantial advantage over petroleum, we are also of a contrary opinion.

A HANDBOOK OF PHOTOGRAPHY FOR AMATEURS IN INDIA.

By GEO. EWING. Calcutta: Thacker, Spink, & Co.

AN esteemed contributor to our ALMANAC for 1897 makes a complaint that Indian periodical photographic literature is scarcely specialistic enough, in that it does not cater sufficiently for the requirements of photographic workers in India. That complaint can hardly hold entirely good with regard to photographic writings in book form, the volume before us being the production of an Indian amateur of many years' experience. Mr. Ewing has diligently studied the writings of the principal workers in photography, and, by the aid of his own extensive knowledge, has produced a volume full of sound, practical information. Indeed, as a plainly written handbook to the production of photographs, it may be questioned whether it is not just as well suited for circulation here at home as in India; it is complete, conscientiously written, and sound in teaching.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(*Received too late for the* ALMANAC.)

AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.—Established 1883. Meetings held at the Royal Society's Hall, Melbourne, Australia. *President:* Mr. E. A. Walker.—*Vice-Presidents:* Dr. J. C. Kaufmann and Mr. E. C. Bell.—*Council:* Messrs. W. Farquaar. G. Heather, J. H. Mulvany, J. Pettigrew, D. W. Paterson, H. C. Ward, C. W. Watts, and E. Wood.—*Custodian of Apparatus:* Mr. E. W. Purton.—*Treasurer:* Mr. F. W. Miscamble.—*Secretary:* Mr. J. H. Harvey, 134, Powlett-street, East Melbourne, Australia.

ETON COLLEGE PHOTOGRAPHIC SOCIETY.—*President:* Mr. T. C. Porter.—*Hon. Treasurer:* Mr. F. H. L. Stevenson.—*Hon. Secretary:* Mr. C. A. G. Mackintosh.

GORDON COLLEGE AMATEUR PHOTOGRAPHIC ASSOCIATION.—Established 1889. Meetings held at Gordon College Geelong. *President:* Mr. H. G. Roebuck.—*Vice-Presidents:* Messrs. J. Wadelton and C. O. Dentry.—*Council:* Messrs. J. B. Leitch, S. F. S. Mawson, W. Thacker, W. M. Waddell, and G. H. Brinsmead.—*Treasurer:* Mr. R. Collins Hocking.—*Secretary:* Mr. John Hammerton, jun., "Burngreave," 73, Little Ryrie-street, Geelong.

KINGSTON-ON-THAMES AND DISTRICT PHOTOGRAPHIC SOCIETY.—Established 1893. Meetings at the Sun Hotel, Kingston-on-Thames. *President:* Rev. G. I. Swinnerton.—*Vice-Presidents:* Rev. F. C. Lambert and Mr. W. Montagu Robertson.—*Committee:* Mr. A Hill, Dr. Luscombe, Messrs. W. E. Price, A. Vandendriesche, and T. Wilson.—*Treasurer:* Mr. W. Montagu Robertson.—*Secretaries:* Mr. J. F. East, Uxbridge House, Surbiton; and Dr. Finny, Kenlis, Kingston Hill.

LIGHT AND TRUTH POSTAL PHOTOGRAPHIC SOCIETY.—Established 1890.—*Secretary and Treasurer:* Mr. T. B. Judson, 68, Broad-street, Worcester.

MOSELEY AND DISTRICT PHOTOGRAPHIC SOCIETY.—Meetings held at Arnold School, Alcester-road, Moseley (nearly opposite Park Hill). *President:* Dr. Hall-Edwards.—*Vice-Presidents:* Captain Davidson and Dr. Ratcliffe.—*Committee:* Messrs. Harris, W. Griffiths, W. Silk, and Dr. Dudley.—*Hon. Secretary and Treasurer (pro tem.):* Mr. C. H. Williams, Forest-road, Moseley.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—Established 1881. Meetings held at the Art Gallery, Newcastle-on-Tyne. *President:* Mr. W. Parry.—*Vice-Presidents:* Messrs. J. S. B. Bell, J. P. Gibson, J. Hedley Robinson, and John Watson.—*Council:* Dr. Blacklock, Messrs. W. E. Cowan, J. E. Goold, W. Graham, George Hall, J. J. Kirkwood, E. G. Lee, T. O. Mawson, Captain Sayers, and Mr. G. L. Snowball.—*Treasurer:* Mr. Frederick Park.—*Secretary:* Mr. James Brown, 31, Market-street, Newcastle-on-Tyne.—*Assistant Secretary:* Mr. Parker Brewis.

NORTHERN TASMANIAN CAMERA CLUB.—Established 1889. Meetings held at Launceston, Tasmania. *President:* Mr. P. C. Maxwell, J.P.—*Vice-Presidents:* Mr. R. Lewis Parker, Dr. F. Cole, and Mr. F. C. Birchall.—*Council:* Messrs. W. H. Twelvetrees, Charles Hart, and J. A. Larner.—*Secretary and Treasurer:* Mr. F. Styant Browne, 112, Brisbane-street, Launceston, Tasmania.

NOTTINGHAM CAMERA CLUB.—Established 1892. Meetings held at the Mechanics' Institution, Nottingham. *President:* His Grace the Duke of Newcastle.—*Vice-Presidents:* Lord Henry Bentinck, M.P., Sir Charles Seeley, Bart., and others.—*Council:* Mrs. Fraser, Miss Stansfield, Messrs. W. Edgar, A. W. Flowerdew, J. L. Dixon, E. Dickenson, and G. Hodgson.—*Treasurer:* Mr. E. H. Wilson.—*Secretary:* Mr. H. Wilkins, 352, Alfreton-road, Nottingham.

OLDHAM PHOTOGRAPHIC SOCIETY.—Established 1867. Meetings held at the Lyceum, Union-street, Oldham. *President:* Mr. J. Brooks.—*Vice-President:* Mr. J. Hall.—*Council:* Messrs. J. S. Dronsfield, J.P., J. Greaves, jun., C. A. Hempstock, T. Heywood, F. Megson, W. A. Nash, and R. T. Taylor.—*Librarian:* Mr. J. Fullalove.—*Treasurer:* Mr. J. Chadwick.—*Hon. Secretary:* Mr. T. Widdop, 17, Queen-street, Oldham.

PLUMSTEAD, ALL SAINTS', PHOTOGRAPHIC SOCIETY.—Established 1896. *President:* Rev. J. W. Morris, M.A.—*Vice-Presidents:* Colonel H. H. Watkin, C.B., R.A., Mr. E. A. Hastings-Jay, and the Rev. C. M. Gibbons, M.A.—*Hon. Treasurer:* Mr. Herbert Clutterbuck, M.I.M.E., M.I.Mech.E.—*Financial Secretary:* Mr. R. W. Barnard.—*Corresponding Secretary:* Mr. G. V. Taylor, 59, Plumstead Common-road, Plumstead, S.E.

SOUTH AUSTRALIAN PHOTOGRAPHIC SOCIETY.—Established 1885. Meetings held at the Chamber of Manufacturers, North Terrace, Adelaide. *President:* Mr. A. W. Dobbie.—*Vice-Presidents:* Messrs. Andrew Scott, B.A., and A. H. Kingsborough.—*Council:* The executive officers and Messrs. A. W. Marshall, S. P. Bond, and C. F. Clough.—*Treasurer:* Mr. R. B Adamson.—*Secretary:* Mr. J. Gazard, Mutual Chambers, 111, King William-street, Adelaide.—*Assistant Secretary and Librarian:* Mr. J. D. Dixon.

SOUTHLAND CAMERA CLUB.—Established 1894. Meetings held at Invercargill, New Zealand. *President:* Mr. J. E. Vernon.—*Vice-Presidents:* Mrs. J. Stronach and Mr. J. W. Poynton.—*Committee:* Messrs. E. B. Pilcher, William Manson, F. W. Bicknell, and James Stewart.—*Secretary and Treasurer:* Mr. A. Morell Macdonald, Esk-street, Invercargill. New Zealand.

WANGANUI CAMERA CLUB.—Established 1894. Meetings held at the Club-rooms, Victoria-avenue, Wanganui. *President:* Mr. A. Elliott.—*Council:* Messrs. Babbage, Brown, and Captain Collins.—*Hon. Secretary and Treasurer:* Mr. D. Meldrum, Wanganui.

WELLINGTON CAMERA CLUB.—Established 1892. Meetings held at the Club-room, Exchange-buildings, Lambton Quay. *President:* Mr. A. de B. Brandon.—*Vice-Presidents:* Messrs. J. McLellan and A. McKay.—*Committee:* Messrs. W. C. Stephens, F. B. Muir, A. C. Gifford, E. H. Freeman, F. J. Denton, and G. W. Barltrop.—*Treasurer:* Mr. T. M. Hardy.—*Secretary:* Mr. M. Buckley Joyce, care of *New Zealand Times*. Private address of Secretary, Wallace-street, Wellington.

News and Notes.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday evening, January 7, Mr. Howard Farmer will read a paper before the members, subject, *On the Influence of Distance on Exposure*, at the White Swan Hotel, Whitefriars. Visitors are welcome.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening next, January 6, Trade Night, Novelties, &c. Makers of apparatus, and dealers, wishing to exhibit novelties will oblige by addressing the Hon. Secretary, Mr. F. A. Bridge, East Lodge, Dalston-lane, London, N.E.

MR. C. A. FERNELEY writes: "I beg to enclose Christmas greeting, reprint of Hill Norris's dry plate, 1865, exposure six minutes, Dallmeyer No. 1, triplet, small stop. I have found that gelatine P.O.P. is admirable for re-printing old negatives on collodion, wet or dry. In those days I printed on eighty or ninety grain bath. I should like to see an exhibition of old negatives printed on modern papers, whether P.O.P. or platinum, which suited best for subject."

ART IN THE CITY.—There is now open at the Guildhall an Exhibition of water-colour drawings by masters of the early English School, lent by Sir Charles Robinson, the Queen's Surveyor of Pictures. The collection includes fine examples of James Ward, John Cozens, Girtin, Prout, David Cox, and others of equal renown. Those of our readers who have an hour or so to spare will do well to pay a visit to this show. The admission is, like all the City's Exhibitions, free. It will remain open till the end of February next year.

Patent News.

THE following applications for Patents were made between December 7 and December 19, 1896 :—

PRINT TRIMMER.—No. 27,865. "An Improved Device for Trimming Photographic Prints and the like." C. S. JONES.

DEVELOPERS.—No. 27,931. "Photographic Developers." Complete specification. J. HAUFF.

APPARATUS.—No. 27,993. "An Improved Photographic Apparatus." C. H. MARTIN.

SHUTTER AND FOCUSSING DEVICE.—No. 28,047. "An Improved Shutter and Focussing Device for use in Hand and Stand Cameras." E. G. PLATT.

ILLUMINATING PHOTO-CHROMOSCOPIC PICTURES.—No. 28,082. "A New or Improved Device or Apparatus for Illuminating Photo-chromoscopic Pictures." F. E. IVES.

REPRODUCING DRAWINGS.—No. 28,087. "Improvements in the Photographic Reproduction of Drawings." Complete Specification. E. GAY.

CINEMATOGRAPHY.—No. 28,097. "Improvements in Cinematographic Apparatus." J. W. HOLST.

ENLARGING AND REDUCING APPARATUS.—No. 28,127. "Improvements in Enlarging and Reducing Cameras." W. GRIFFITHS.

CINEMATOGRAPHY.—No. 28,152. "Improvements in Apparatus for the Exhibition or Projection of Photographic Moving Objects." G. A. SMITH and A. S. FRAZER.

PRINTING FRAMES.—No. 28,207. "Improvements in Photographic Printing Frames." J. BATTY.

RETOUCHING APPARATUS.—No. 28,219. "Improvements in Apparatus for Retouching." M. JOHNSTONE.

CINEMATOGRAPHY.—No. 28,452. "Improvements in Apparatus for Projecting, Taking, Printing, and Viewing 'Animated' Photographic Pictures." O. VOLKMANN.

CINEMATOGRAPHY.—No. 28,799. "Improved Appliance for Taking, Projecting, and Printing Animated Photographs." J. W. L. NAISH.

CHANGING BOXES.—No. 28,813. "Photographic Changing Boxes." C. E. PECZENIK.

DARK ROOMS.—No. 28,959. "Improvements in Portable Photographic Dark Rooms." W. T. FERGUSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
4	Ealing	*Hand-camera Work.* W. Thomas.
4	Putney	*Pictorial Photography.* A. Horsley Hinton.
4	Richmond	Lantern Evening: Members' Slides.
4	South London	*Enlarged Paper Negatives.* H. Stuart.
4	Stafford Y.M.C.A.	Lantern Evening, Members' Slides.
5	Brixton and Clapham	*Architectural Photography.* H. W. Bennett, F.R.P.S.
5	Gospel Oak	Decorative Photography.
5	Hackney	*Enlarged Paper Negatives.* H. Stuart.
5	Isle of Thanet	Lantern Evening: *Holiday Reminiscences.*
5	Lewisham	B. Davidson.
5	Rotherham	*The Treatment of Figures.* Rev. F. C. Lambert, M.A.
5	Wolverhampton	Lecture.
6	Croydon Camera Club	Lantern Slides.
6	Leeds Camera Club	Smoking Concert.
6	Leytonstone	*Lantern Slides by Reduction and Printing-out Plates.* C. A. Russell.
6	Newcastle-on-Tyne	Prize Slides.
6	Photographic Club	Trade Night.
7	Leeds Photo. Society	*Simple Subjects and their Treatment.* W. Thomas.
7	Leigh	Prize Prints.
7	London and Provincial	*On the Influence of Distance on Exposure.* Howard Farmer.
7	West Surrey	Social Night and Discussion on the Coming Exhibition.
7	Woodford	*Negative-making.* Chapman Jones.
8	Ireland	Lantern Evening. E. Macdowel Cosgrave.
8	Oldham	Annual *Soirée* and Dance.
8	West London	Technical Evening.

PHOTOGRAPHIC CLUB.

DECEMBER 23,—Mr. R. P. Drage in the chair.

Mr. FOXLEE drew attention to a statement which appeared in a recent issue of the *Amateur Photographer*, and which referred to the old South London Photographic Society.

It was agreed by all the some-time members of that Society who were present that the statement was entirely incorrect.

Mr. HAES drew attention to an apparatus (of which he showed a sketch) for pneumatic dusting. The method by which the dusting was effected appeared to be an air-sucking device, actuated by bellows. Mr. Haes pointed out that in certain photographic operations dust was a most potent enemy, and this apparatus promised to remove dust without raising a cloud of it in the operation.

Mr. JOHN MCINTOSH read a paper on

INTENSIFICATION AND REDUCTION.

His paper, said the author was intended for beginners. It was written at the

request of the Affiliation Committee. The occasional necessity of the processes to be considered was obvious. He would deal with the characteristic peculiarities of the different published formulæ by analysing the requirements of imperfect negatives into seven classes. It must be remembered that no intensification process would add silver exactly in the position required, but would deposit it around the already existing molecules. In practice, reducers acted with less certainty than intensifiers. With reasonable care he expected to get permanency with mercury. Mr. McIntosb, in dealing with the details of intensification, said that the usual processes by bleaching with mercury perchloride and subsequent darkening of the image by ammonia, sodium sulphite, or redevelopment, were suitable for correctly exposed negatives. The gradations were not altered in relative values. Monckhoven's cyanide of silver and Eder's cyanide and iodide of potassium were suitable for over-exposed and under-developed negatives. Edwards's one-solution intensifier had the advantage that the required result could be obtained at one operation, but it was of doubtful permanency. With mercury and Schlippe's salts, and with the uranium intensifier, great density could be attained, but the negative became very non-actinic in colour. The latter method was specially suitable for under-exposed and under-developed negatives. Wellington's silver sulphocyanide intensification was the most reliable of added silver methods. For line work, Eder and Toth's lead intensifier was described. Of reducers, the lecturer said that Howard Farmer's was the most popular method, but that it sometimes leaves a yellow stain. This disadvantage does not follow the use of Belitzki's potassium ferric oxalate, which was simple in action and clean in result. It, however, reduces the shadows more than the high lights, as does Farmer's. He pointed out that some reducers, notably hypochlorite of soda, are inclined to alter the definition of the negative treated. This is probably due to the reducer acting physically upon the gelatine film as well as, and independent of, the chemical action. In concluding, Mr. McIntosh recommended workers to do without the use of these expedients, and get negatives which were developed to the required quality at one operation if possible. The lecturer illustrated his remarks with a set of lantern slides, which evidenced the results of the action by the various intensifiers described by him.

The CHAIRMAN said Mr. McIntosh need have made no apology for his paper. It needed none, being useful alike to all. It appeared to him to be an admirable *résumé* of the subject, practical and plainly worded.

Mr. FRY agreed, and added that for practical purposes it was often very convenient to use a one-solution intensifier, such as Edwards's. He preferred, however, to reduce the amount of hypo used in Edwards's formula, and to use a final fixing bath, which should be very weak. This cleared the shadows of the yellow deposit which often arose. Permanency, though alweys a desirable quality, was not the only thing aimed at when intensification was resorted to. It was often a question of intensification or nothing.

Mr. MACKIE also congratulated Mr. McIntosh upon his paper. He said that he was looking through some old negatives a short time since, and found several intensified by Edwards's formula which were quite good. The process was perhaps the only one easily available in the first days of gelatine plates. Perhaps, if negatives so intensified had been varnished, they would have stood the test of time better than they had done. He thought Mr. McIntosh had not referred to, or advised the use of, an addition of hydrochloric acid to the plain mercury solution used for bleaching purposes.

Mr. MCINTOSH, having referred to the several points upon which discussion had arisen, was most cordially thanked by the meeting.

North Middlesex Photographic Society.—December 21, 1896, Mr. H. Smith in the chair.—Mr. SMITH gave a general survey of the year's work at the Instruction Evenings, which are held once a month. The advantages of these evenings and the interest evoked has been very apparent. A discussion on printing processes then took place, and their merits compared, after which Mr. Macintosh showed a camera which had been made especially for the changing box shown at a previous meeting. Messrs. B. J. Edwards & Co. kindly sent some lantern plates and developer, which were distributed among the members.

DECEMBER 28, 1896, Mr. Mummery in the chair.—Messrs. R. J. Wilson, J. Durston, C. S. Ball, J. Angus, Ernest Clarke, C. H. Wilkins, A. L. Tyler, and F. Micklewood were duly elected members of the Society. Messrs. Beadle and Hamilton were elected Auditors for the Treasurer's accounts. Mr. COX, the Hon. Librarian, announced that he had been able to make several additions to the library, owing to the generosity of several of the members. The nomination of officers for the ensuing year then took place. In the competition, Outdoor Figure Study (not a portrait), Mr. Smith was placed first, and Mr. S. E. Wall second.

South London Photographic Society.—December 21, 1896.—The last meeting was devoted to a Social Evening, under the direction of Messrs. J. T. French (Hon. Lanternist) and W. C. Boyce. Songs were contributed by Misses French and Hunt, Messrs. Harry Jones, A. E. Allen (Excursion Secretary), Boyce, Walter Hamsell, and Harry Briden. Madame Kemp played some violin solos, and also assisted in two trios. An exhibition of the cinematograph by the Prosser-Roberts Company added farther variety to a very pleasant evening.

FORTHCOMING EXHIBITIONS.

1897.

January ..... Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

,, 1, 2 ..... Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.

,, 14, 15 ..... Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

February 1–27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

March 6–13 ..... South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PITS IN GELATINE PLATES.

To the EDITORS.

GENTLEMEN,—I am much surprised to learn from J. H. P.'s letter, which appeared in your issue of the 18th, "that plates having pits should be sent out by a well-known maker." As the remedy is so simple, I would advise J. H. P. to call the attention of the maker in question to my last letter on the subject. Very little can be done with the plates already coated; I would suggest, as a partial cure, soaking the plates, previous to development, for two or three minutes in water, or perhaps, better still, in the developer before the alkali is added; this will allow a more equal reduction. The genuine pits usually give opaque patches, or spots, which, when viewed by reflected light, are matt. This I account for by the fact that, where the spots exist, there is less gelatine, although the same amount of silver remains. Consequently, it reduces faster than the other parts. There is another kind of spot very much resembling pits, which are caused by fine particles of some foreign matter falling on the plates before the emulsion is set. On examination with a strong lens, they are easily seen in the centre of each spot. I am not aware if it is generally known that filtration of emulsion will alter the speed, *i.e.*, through washleather, it breaks up the crystals of silver bromide, thereby slowing it. The best emulsion filter I know of is a small cup sponge, placed in a large funnel, but care should be taken to thoroughly cleanse it every time it is used, by well washing it in hyposulphate of soda, and again washing. The reason will suggest itself to all emulsion-makers.—Yours truly,

A. L. HENDERSON.

Hôtel Finstermünz, Meran, Sud Tirol, Austria, December 21, 1896.

THE BENEVOLENT.

To the EDITORS.

GENTLEMEN,—Your Ex Cathedrâ note on page 817 of last issue is scarcely correct. The Photographers' Benevolent Association is not dead, but it is in the unfortunate position of being the trustee of some 300*l.* which, under the terms of its trust, it unfortunately cannot use. The people for whom the Benevolent was intended have never supported it, and last year the Council had to face the fact that almost all the support hitherto obtained from the photographic merchants and amateurs was almost entirely withheld on the ground of non-support by the class of men who received benefit from the Association. In order to make the trust fund available for the general purposes of the Association, an immense amount of time and labour was spent by the Council, the Society's Honorary Solicitor, and myself. After much correspondence with the Registrar of Friendly Societies we worked out a scheme which was agreeable to that gentleman, and took steps to carry the scheme into effect. Unfortunately the scheme met with opposition from a totally unexpected quarter, which so disheartened my Council and also the members of the Association, that it was found impossible to obtain a quorum at the annual general meeting. At the present time there is a possibility that the unexpeeted obstruction may soon be removed, and, if so, a few of the members of the Council will again take up the difficult task of complying with the requirements of the Friendly Societies Act with a view to making available the funds which we hold in trust. If the sanguine gentleman of whom you speak in your note will communicate with me, the Council of the Benevolent Association will be very glad indeed to have his assistance.—I am, yours, &c.,

H. SNOWDEN WARD, *Hon. Sec.*

6, *Farringdon-avenue, London, E.C., December* 28, 1896.

AN EXPLANATION.

To the EDITORS.

GENTLEMEN,—A notice having appeared in one of the trade journals to the effect that our business has been transferred to May & Baker, Limited, we shall esteem it a great favour if you will enable us, by the insertion of this letter in your next issue, to inform our friends that such is not the case, and that we have no intention of making any change of the kind. The confusion may have arisen through our transferring our cyanide manufacture to the above firm, but nothing more has been or will be so transferred.—We are, yours, &c.,

JOHNSON & SONS, *Manuf. Chemists, Limited.*

23, *Cross-street, Finsbury, London, E.C., December* 28, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

RECEIVED.—C. L. HETT; E. WALLIS; and others.

B. O.—No, to both questions.

PORTRAITS WITH SNOW FALLING.—W. FIELDING. See leader on another page.

WHITE INK.—L. M. says: "Can you give me a receipt for making white ink?"—Nothing answers better than ordinary Chinese white.

FRILLING.—T. SAUNDERS. The frilling of the film is readily accounted for. In taking "the chill off the developing solution and slightly warming the dish," you have made them too warm. Hence the trouble.

THE CONVENTION.—P. O. BOYDE. The Photographic Convention does not hold weekly or monthly meetings in London, as you appear to imagine. It meets but once a year—an annual gathering of photographers.

RESIDUES.—C. M. If the residues are reduced to the smallest possible bulk by drying and burning, and the extraneous matter sifted out, you cannot do better than send them to a respectable refiner. It will be more profitable than attempting to reduce them at home without proper appliances.

CARRIAGE OF GAS CYLINDERS.—T. SMITH. So far as we are aware, the metropolitan carriers make no demur to conveying charged gas cylinders, or, at least, such as some of the railway companies do. Write to the manufacturers you intend to deal with. They will inform you the best means of transmission.

PHOTOGRAPHING SILVER PLATE.—ARGENT. Yes; when photographing silver goods against a dark background, the plates should be backed, even if they do contain an iodide. The trouble involved will be repaid in the results. Unless perfect negatives are supplied, perfect collotypes must not be expected from their producers.

COPYRIGHT.—S. W. B. As you are not a member of the Copyright Union, you can scarcely expect it to espouse your cause in the dispute. From your statement of the case we doubt if you can recover damages, or, if you do, they will be but nominal. May we hint that it looks like a little "sharp practice" on your part?

STAINED NEGATIVE.—AMATEUR, N.W. There are two distinct causes of stains on the negative sent. The larger one is due to imperfect fixation—the bromide of silver not removed. The smaller one from its being printed from without its being sufficiently washed to free it from the hyposulphites. Remedy, in both cases, obvious.

DRYING COLLODIO-CHLORIDE PRINTS.—J. ABRAHAMS. Yes. Collodio-chloride prints can be blotted off the same as albumen prints can be, or they can be dried before the fire. There is no fear of the film sticking or melting, as is the case with gelatine. It is, however, not advisable to make collodion prints too dry, or there may be a danger of the film cracking.

W. T. SMITH.—We believe the gentleman named was a spiritualist and a believer in spirit photography. We saw several of his productions. As to the third question, whether there is "such a thing as genuine spirit photography, we are under the impression that an offer, published repeatedly last year in our contemporary, *Light*, of 100*l.* for a "genuine spirit photograph," is still open.

REPRODUCED PHOTOGRAPHS.—C. F. W. writes: "Kindly give me answers to the following questions: 1. Is it illegal, in copying photographs, to have them mounted on own printed mounts, say original, not being my own work? also, 2. If same applies to enlargements done for the profession and paid for?"—1. It is not illegal, but it is customary to add "copied by" before or over the name. 2. No.

H. T. LAWSON.—1. The indiarubber solution may be made by dissolving the rubber in benzole—say, ten grains to the ounce. The addition as recommended in the formula should give a transparent deposit. 2. No such articles appeared about that date. If you can give us author's name, or, at any rate, less vague data to go on, we may be able to find the necessary information for you. 3. Messrs. Penrose. We cannot tell the price.

DISPOSAL OF BUSINESS.—O. A. says: "I wish to sell my business, but hardly know how to go about it, and this is why I have been in it for eighteen years, and have made enough in the time to retire upon. But, during the time, I have kept no books—that is, books showing Dr. and Cr. accounts and the profits made. The business was practically a ready-money one, so there was no necessity for it, as I expected my son would have succeeded to it; but he, unfortunately, died a few months ago. Can you give me any advice?"—Having no books to show what profit has been made will certainly militate against getting the full value for the goodwill. Probably the day-book will show the takings, and from them, and the rent, taxes, and general working expenses, the profits may be roughly deduced. But we fear that, however good the concern may be, its full value is of doubtful realisation, as, under the circumstances, the vendor is heavily handicapped.

RESTORING DAGUERREOTYPE.—NOVICE (Eton). A Daguerreotype that has become tarnished (generally looked upon as faded) can be cleaned and made equal to what it was when first taken by treatment with a solution of cyanide of potassium. The mode has frequently been described in these pages. But, if the picture is of any value, we should recommend its being put in the hands of some one *au fait* with the work, as a Daguerreotype is easily irretrievably ruined.

COMPRESSED ACETYLENE GAS.—C. BATES writes: "Can you give me the address of any house that would supply me with acetylene gas compressed in my own oxygen cylinder? I have inquired at several places, and they tell me they know nothing about it."—We know of no house that supplies acetylene in this form, nor do we think that any do at present, nor is it likely that any will until something more is known about the character of the gas under pressure.

ALLEGED MISREPRESENTATION.—R. W. Yours is by no means an isolated case of a business being sold and the purchaser finding the profits, or the returns, not what they were represented to be. We fear you have no redress, unless you can prove that there was a fraudulent misrepresentation in the matter. The defence to any action would probably be that the incomer's work was not so good as his predecessor's, or, perhaps, he was not so well liked by the customers, &c. If the accounts shown can be proved to be not *bonâ fide*, then there will be good cause of action.

"OXY-OLEFIANT LIME LIGHT."—C. C. WRIGHT says: "I read recently a glowing account of the enormous power and advantage over the ordinary lime light of a light called "the oxy-olefiant lime light." Would you kindly say, in next issue, where such oil gas may be obtained compressed, what it really is, and if it has great advantages over lime or electric light for lantern work, as the book I saw stoutly maintained?" In reply: We have not seen the reference to the light named. Some reader of this column may, however, supply our correspondent with the desired information.

BUILDING RIGHT.—WORRIED writes: "In September I took on lease the upper part of a house, with permission (stated in the lease) from the owner to build a studio on the top. This I have done. Now I have notice from the ground landlord to take it down forthwith, or it will be removed by force, as it is against the terms of the original lease. Must it come down?"—Yes, if the ground landlord insists. Your landlord has granted you rights that, evidently, were not his to grant. Your remedy is against him for damages. It would always be better in such cases to see that there is nothing in the original lease, as in this case, to prevent building.

ENCAUSTIC PASTE.—J. SOAMES asks, in effect, "What is encaustic paste, what is it for, and how is it used?"—Encaustic paste is a compound of beeswax and solvents, as given in the ALMANAC, that was introduced many years ago for treating albumen prints with. It served a double purpose. It rendered the shadows more transparent and added to their vigour. It also gave a protective surface that resisted moisture, and thus, to an extent, increased the stability of the photograph. It is applied very much after the style that furniture is polished with beeswax in a country house, namely, rubbed on, and then polished off with a piece of flannel. In fact, it is just the same in principle and application.

STRIPPING NEGATIVES.—GEO. THOMPSON says: "I have been making process negatives on dry-collodion plates, and have been successful with them up to stripping the films. The directions say, Coat negative with rubber solution, allow to dry, then recoat with enamel collodion, and proceed exactly as with wet collodion. I have never worked with wet collodion, so do not know how to go on. Will you kindly tell me how to finish the stripping and oblige?"—The glass, prior to coating with the emulsion, should either be rubbed over with French chalk, or be waxed. Then no difficulty will be experienced in getting the film off, that is, supposing the indiarubber coating is perfect. A very general method of stripping collodion films is, instead of using the rubber protective coating, to place the finished negative on a levelling stand and pour on a solution of gelatine, and, when that is dry, strip off. In either case, the glass must be prepared for the stripping by treatment with French chalk or wax.

COLLODIO-CHLORIDE PRINTS.—J. BANKS asks: "Will you kindly answer the following:—1. I have been putting collodio-chloride prints on glass for enamels, and lately I have had trouble in getting them off, a lot of them refusing to come off at all. I have washed well before toning with sulphocyanide bath, and washed well after fixing, then put them in a saturated solution of alum for fifteen minutes and washed, then put them on to glass, which had been well washed and then rubbed with French chalk, which I rubbed off again, and then let the water run on the glass for a minute or two; I then put the prints on and squeegee down, and let them be all night, and in the morning let them dry thoroughly beside the stove. I sometimes use the same sulpho bath three times. 2. If the French chalk was damp, would that cause it? 3. Is it necessary to use alum? I can't possibly understand the reason of their sticking, as I have got hundreds to come off easily by the same treatment. I shall be greatly obliged if you can help me, as it will be a serious thing for me if I can't find the cause of it."—In reply: 1. The treatment of the prints had nothing to do with the trouble. It must be that the glass was not rightly treated—the French chalk not sufficiently rubbed in or too completely cleaned off afterwards. 2. Possibly it should be applied dry. 3. No; it is no good whatever. As our correspondent has succeeded so well hitherto, it is difficult to explain why he does not do so now.

*** Several answers to correspondents unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1914. Vol. XLIV.—JANUARY 8, 1897.

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EX CATHEDRÂ.

Our reference last week to the use of bromide paper for radiographic purposes, with the suggestion that a paper of greater rapidity than is at present obtainable might be advantageous, appeared at an opportune moment. The matter has recently been engaging the attention of the Eastman Photographic Materials Company, with the result that a paper specially prepared for radiographic work, and called the X-ray paper, is now ready to be placed on the market.

* * *

The new paper appears to be of remarkable rapidity when exposed to the Röntgen light. We were shown specimen prints of the human hand that had been made upon it, and that had been exposed for two minutes against one of the fastest plates on the market, and the result yielded by the X-ray paper was in every way the equal, as regards detail, of that given by the plate. Other prints shown us proved that the X-ray paper, when interleaved with Nikko paper (which has been recommended, and, indeed, is suitable for radiography), is quicker than the latter, and, with several sheets superposed, can be used for obtaining a number of excellent results with one exposure.

The advantages of paper for radiographic purposes are obvious. A direct "positive" may be obtained, and the flexibility of the support allows of it being placed in contact with portions of a limb or other object, to which with glass it is impossible so to gain access. The Eastman Company inform us that the X-ray paper is to be sent out with each sheet placed in a separate opaque envelope. Medical men and experimentalists will, doubtless, appreciate this convenience.

* * *

The Kromskop is the name finally chosen for Mr. Fred. E. Ives's perfected stereo-photo-chromoscope, which was described at p. 39 of The British Journal of Photography for 1896. Several of the instruments and sets of kromograms are publicly on view at the St. George's Gallery, 14, Grafton-street, Bond-street, W., and we recently passed a little while inspecting the pictures that are to be seen there, both by electric light and daylight.

* * *

Having seen Mr. Ives's photo-chromoscopic results in their progressive stages of development since they were first publicly shown in London, some five years ago, we were in a position to appreciate the degree of practicability he has succeeded in giving to the principles of three-colour heliochromy, upon which the kromskop is based. It is but the merest truth to say that the kromskop, as an instrument, appears to be perfect in its simplicity, and that the colour reproductions it exhibits have a flawlessness and fidelity little short of marvellous.

* * *

The subjects are taken and shown stereoscopically, and the oculars of the kromskop are placed at near centres, so that the illusions of relief and solidity are readily obtained. A flower bed in Hyde Park, an opal, an oil painting, coloured vases, the contents of a smoker's cabinet, a box of sweets, a vase of flowers, are among the subjects shown, and have obviously been chosen with the view of illustrating the power which the kromskop has of faithfully reproducing the colours of the originals, and which it exercises, in a way that causes wonder and delight, not only to the layman, but to those who have given colour photography long attention.

* * *

It is probable that this system of colour reproduction will find numerous applications in the arts, sciences, and manufactures, as well as for different photographic purposes. The

limits to its usefulness, indeed, are difficult to define. We understand that kromskops and sets of kromograms will shortly be obtainable from the Photo-chromoscope Syndicate, Limited, of 119, Shaftesbury-avenue, W.C. There is an inelegant and Muscovitish appearance about these same words, "kromskop" and "kromogram," for which we find it difficult to forgive Mr. Ives; but we honestly congratulate him on the results of his years of hard and uninterrupted work in heliochromy, for which he deserves the success that we believe awaits him.

* * *

Messrs. Elliott & Son, of Barnet, inform us that they are building a new dry-plate factory. Towards the end of last summer the sale of their plates increased to such an extent that they found they could not turn them out quickly enough from the present factory to meet the demand. They therefore decided to build an entirely new factory, to work side by side with the old one, but removed far enough away from it, as a precaution against fire. The new factory consists of two blocks of buildings covering nearly half an acre; in one block are the laboratories and emulsion-making rooms; in the other block are the coating, drying, and packing rooms, as well as engine and boiler-house. The machinery, which will include the very latest improvements, will be driven by a seventeen horse-power steam engine. Messrs. Elliott & Son intend to generate their own electricity for lighting purposes.

PRACTICAL MERCURIAL INTENSIFICATION.

The paper on *Intensification and Reduction*, read before the Photographic Club by Mr. John Macintosh, is a valuable contribution to an interesting topic; but, if he had charge of a column of Answers to Correspondents for a few months, the probability is Mr. Macintosh would lighten his vessel by throwing overboard a considerable portion of his cargo. Speaking now of intensification alone, there can be no doubt, first, that a large number of negatives are used to print from that would be very materially improved by a little intensification, through the majority of their owners very probably being unaware of the fact. Secondly, there is a not inconsiderable proportion of such weak negatives printed under sufferance, as it were, simply because their owners, owing to the multiplicity of published methods, have hesitated to give a fair trial to any one, and "risk it." Now, in most things photographic, it is a golden rule to try one thing, be it process or plate, and to stick to it till all or many of its peculiarities are mastered. This is an excellent rule to adopt in questions of intensification, and our remarks will be confined to one particular branch of it—the oldest of all.

It is now only a few years short of half a century since photography became really popularised by Archer's practical collodion process, within a few years after which introduction the whole country became flooded with glass positives. Before long it became a desideratum to get prints on paper, and the process obtaining the greatest popularity was to "convert" a positive, as the term went. This "conversion" was simply intensification of the silver deposit, the plan adopted being to dissolve corrosive sublimate in water, usually by the aid of a little added sal ammoniac, immerse the positive in this solution till white throughout, and then, after washing, to put the plate in a dish of water slightly impregnated with either ammonia or sulphide of ammonium (hydrosulphuret of ammonia the latter was then called), till it was black on both sides. We have no doubt such "converted positives" are in existence still, varnished, of course—there was no printing from unvarnished negatives in those days—and in a state of excellent preservation. We have often handled similar negatives a quarter of a century old in perfectly good condition. So much for their permanency.

There is, we know, a prevailing idea that intensified negatives are necessarily makeshifts, and inferior to those brought up to full printing density by development alone. We can record a definite statement with regard to this matter. We have been credibly informed — we do not doubt the testimony for one moment — that, in the later days of the *carte-de-visite* mania, when shades of excellence in work were being appreciated, the operator of one of the most popular photographers in the country obtained the required density on all his negatives by this process of mercurial intensification. He developed with iron and intensified with mercury. It is not probable that he would have retained his post if his work had not been first class. The *rationale* of the process is precisely the same in gelatine as collodion.

About this same *rationale* we will not quarrel with the text-books, at this moment, with regard to it; but we feel compelled to call attention to one singular point to which a well-known contributor has drawn our attention. With praiseworthy unanimity, it is stated in all the books that the mercuric chloride causes the production of an image of a new composition, a mixture of silver chloride and mercurous chloride, which, when placed in solution of ammonia, has its silver salt dissolved out and mercury salt blackened. Now, what our contributor states, and if his chemicals were in order when he showed us the experiment, proved, is that the silver salt does not dissolve — that, indeed, with an ammonia solution far stronger than is necessary for the purpose of blackening, not one particle of silver salt is dissolved out. This experiment can easily be repeated. We saw it tried with an intensified collodion film, which was then stripped, placed in a test tube with ammonia solution, soaked for half an hour, and the liquid did not discolour when sulphuretted hydrogen was added.

As to the exact details of the process, they are simple in the extreme. The mercuric chloride solution is made best without any extraneous addition, such as ammonium chloride or hydrochloric acid, for instance. An ounce to a pint of water is a useful strength, well under saturation point at ordinary temperatures. It may here be said that the salt can be purchased ready powdered, in which form it is much more convenient for use. To dissolve the salt the best way is to use boiling water, which will dissolve more than half its weight, though, of course, most of it would fall down again upon cooling. If kept clean and free from contamination, the solution may be used many times.

The negative to be intensified should be well washed to free it from hypo; otherwise stains would ensue.

We recommend that no attempt be made to remove the negative at the first, the blackening, stage; it should be allowed to remain till white on both sides.

The final stage is simply the immersing the whitened plate, after a most thorough washing, in weak ammonia water of indefinite strength, say, half an ounce of strong ammonia solution to a pint of water. Care should be exercised that the plate be covered with the solution at one sweep or stains may be found.

It will naturally be said that there is here no power of

control. There is not; that comes afterwards. If the intensified plate be too dense let it be immersed in weak hypo solution, and examined from time to time. It will be found that the intensity is gradually reduced, and, when the required reduction is nearly, but not quite, arrived at, the plate should be withdrawn and well washed immediately, as the reduction continues till the hypo is washed away.

Finally, let us ask those of our readers who have hitherto held back from intensifying their negatives from a fear either of want of permanency or impairment of quality to make a few trials of this eminently simple process; they may rest assured of the permanency of the negative, and will not be displeased by the character of its gradation.

North Pole Expeditions.—M. Andrée, writing to the Paris *Temps*, says that, since M. Godard and M. Sourcouf have announced their intention to attempt to reach the North Pole by means of a balloon, some newspaper articles imply that he has abandoned his idea of reaching the Pole with his balloon. This, he says, is not the case, as he has already received all the money necessary to enable him to renew the attempt this year, and that he intends to do so. We wish him success and a safe return.

Perfidious Albion Once More.—The anti-English papers of France are continually decrying Englishmen under one pretext or another. Last week the *Libre Parole*, in an article on espionage in France, asserts that a certain Scotland Yard official, who is allowed to travel freely in France, under the pretext of investigating anarchist designs, is nothing but a spy; also that the majority of the so-called English tourists are nothing but spies in the pay of England and the Triple Alliance, and demands that greater restrictions should be placed on Englishmen in France. Such articles as this serve only to amuse the English tourist while at home; but, if read and believed in by over-zealous gendarmes, they may subject him to great inconvenience when in France, particularly if he be accompanied by a camera, and should happen to pass anywhere near a fort. To be clapped in durance vile, even for an hour or two, when on pleasure bent, is not pleasant. English photographic tourists in France need be cautious where they go.

A Cool Request.—According to the *Daily Graphic*, a letter was received by the Hampstead Board of Guardians last week, from a Mr. Frank Craig, asking to be allowed to sketch some of the inmates of the workhouse. One of the guardians rightly remarked that an application of that kind should be made to the paupers themselves; another, that "we shall be asked next to let the inmates out as models;" while another said, "Mr. Craig can get plenty of models if he is willing to pay for them." The clerk was, of course, instructed to inform Mr. Craig that the Guardians could not give the permission asked for. It would certainly be a new employment for the unfortunate inmates of workhouses, to use them as artists' models. There are, as one of the gentlemen remarked, plenty of artists' models to be had by paying for them, and why should paupers be asked to take their places? The lives of professional models are not over-pleasant, nor is their pay over-remunerative. The Hampstead Board of Guardians are to be commended on their action. The feelings of inmates of workhouses, though paupers, must be respected.

Foreign *versus* English Printing.—Most of us have, no doubt, received our usual number of the seasonable greetings in the form of Christmas and New-year's cards. Each year these little tokens seem to be of a more *recherché* character than hitherto; but does it not come like a reproach to English printing to see, on the majority of them, the imprint: "Printed in Germany;" "printed in Bavaria;" "printed in Austria;" "printed in America," &c.; although the imprints bear also the words, "designed in England?" Turning from Christmas and New-year's cards to the coloured presentation pictures with the Christmas numbers of the illustrated periodicals, we find the same imprint meets the eye, although the original paintings are, in most instances, by British artists. "Made in Germany" is generally taken to imply something inferior to that of British production. "Printed in Germany" is rapidly becoming recognised as being something superior when applied to colour printing, art reproduction, photogravure, &c. Why should foreigners monopolise this class of business in the English markets, and how long is it to continue?

Applications for Patents in 1896—a Great Increase.—During last year no less than 30,165 patents were applied for. This is an increase of more than 5000 over the applications in 1895, when the number was 25,053, a decrease of more than 300 on the year before. For many years past, until 1895, there has been a steady yearly increase in the number of patents applied for. In 1890 the number was 21,303, hence in the six years there has been an increase of about 9000. Our weekly Patent News have shown that there has been no falling off of the number of patents applied for in connexion with photography. During the past year, photographic dealers, like several others, have complained loudly that the craze for cycling has very materially interfered with their business, and, no doubt, with good cause. It is a significant fact that, out of the number of last year's patent applications, no fewer than 5500 were for, or relating to, cycles or "velocipedes," according to Patent Office phraseology. It would be interesting to learn, at some future period, how many out of this number are completed, and what proportion of those that are will yield the patentees a profit; also, how many of them would prove valid, if contested.

Peterborough Cathedral.—A pretty little paper war—not to say an acrimonious one—has been waged in the daily press for some time past between the Dean and Chapter on the one part, and the Society of Antiquaries and the Society for the Protection of Ancient Buildings on the other, as to the west front of the building. For a long time this portion of the building has been known to be in a very unsafe condition, and the Dean and Chapter, who are the custodians of the cathedral, and who are responsible for its stability and the safety of the public who visit it, have decided, on the advice of two eminent architects, to take the greater portion of it down and rebuild it exactly as it is now. The antiquarians, on the other hand, say this is unnecessary, and that the front can be repaired and made safe without, and, if it is rebuilt, its beauty will be destroyed, &c.

It seems a little difficult to the lay mind to realise why this should be the case if, as is proposed by the Dean and Chapter's architects, the stones are numbered as they are taken down, and all that are fit restored to exactly the same places they formerly occupied, the faulty ones only being replaced by new ones. Surely modern architects and masons should be equal to this work. If not, there are plenty of photographs of the front to guide them. "Restorers" frequently get roundly abused by antiquaries, and sometimes not without reason; and it is to be hoped that there will be no cause for that when the west front of Peterborough is restored, whichever way it is done, for it is one of the finest pieces of architecture in the kingdom. It will be interesting to compare photographs taken after the restoration with those produced before it. They will settle all disputes as to the restorers' work.

By the way, the picturesque old buildings in London that artists and antiquaries so cherish are rapidly disappearing, to make room for larger and more sanitary buildings, and a few years more will see a number of them cleared away from the neighbourhood of the Strand. Those who desire photographs of them should secure them while they are yet occupied, as, when empty, they are quickly plastered over with "posters," or are boarded or shored up for safety; then their picturesqueness is destroyed. At times one is inclined to wonder if some of the fine buildings erected during the present time will be venerated by the antiquaries of a few centuries hence to the same extent as are those of a few centuries back by the present generation of artists and antiquaries?

ON THINGS IN GENERAL

A HAPPY New-year to all! Happiness in the home! prosperity in business! Every one says business is improving, but the photographic friends I talk with shake their heads and say it has not come their way. There is one way in which, however, very many, to my certain knowledge, may increase their profits materially, and, if they look at a recent article by Mr. Pretzl, they will be put on the track. I refer to the saving of residues, and more especially, as I believe I have more than once before written, the hypo residues. I think I have referred to one of the largest publishing portraitists in London who does not follow this advice, but dumps all his used hypo solutions into the sink at a rate of some hundreds of pounds worth per annum. I am speaking of waste-collecting on general principles, for I think Mr. Pretzl, in treating of many methods, has rather lost sight of the guiding principle of economy. Thus, if it be attempted to recover the silver from hypo waste with hydroxylamine hydrochloride, I am afraid the experimenter would find a balance on the wrong side when he totalled up the cost of the process. It is true that liver of sulphur is apt to produce a by no mean s pleasant smell; but, the great secret is the use of a minimum quantity. He is scarcely correct in saying that "no fumes are given off" when throwing the silver down with zinc or magnesium powder. And here again—magnesium powder! Rather a costly precipitant, whether for paper washings or fixing solution. Finally, if any one possessed a battery to work an induction coil referred to, he would get just as much silver electrolytically deposited as if he passed the current through the coil first. Still, the principle that Mr. Pretzl advocates is of sterling merit, Save your residues.

Speaking of electricity leads me to a reference to an article by Mr. Cecil M. Hepworth which appears in the same number of the JOURNAL. It is a bright, chatty article, with many useful hints, but readers must not run away with the idea that the "ready-made electricity" he refers to, that obtainable from accumulators, is quite the simple affair it sounds. Accumulators, especially when they have to be moved about, are very readily disarranged, and, as to Mr. Hepworth's view that, "unless they are grossly ill-used, they will require no attention whatever until the charge of electricity is exhausted," it may be an accurate statement in itself; but it is well to remember that, if they are not used or ill-used at all for a month or two, say, the exhaustion will have spontaneously taken place though there may be no perceptible short circuiting. Accumulators will not do if they are only occasionally required.

Acetylene is still increasing in favour, but the attitude of the fire insurance companies is serious. My strongest advice is that every photographer, before paying his premium, should require his policy to be endorsed with permission to use it, uncompressed, and, if that permission be refused by his office, to take out a short-term policy, so as to be on the safe side, and forthwith seek for a company who will take his risk with acetylene, and there are plenty, I am told, of first-class offices which will take the risk. Let every one look to this at once. January 9 is the last day for renewing fire policies for this quarter. *Verbum sap.*

Just another word about electricity. Mr. J. P. Nott is another interesting writer, but he will be rather a puzzle to the non-expert who looks to this paper for advice as to how to get his electricity for X rays. For, first, he says, "Primary batteries are . . . . most unreliable and most expensive. Let no one of your readers imagine he will economise by investing in primaries. He will quickly find . . . . he is spending as much as would provide him with a good accumulator." Then he goes on to say, speaking of accumulators, "it will not always follow that 'all you need do is to use it for so many times, then send it away to be recharged,' which seems very simple. My advice is, Don't have an accumulator unless you can yourself see to its 'charging,' test the voltage and current, &c., and see that everything is in proper working order." Of course, everything here put down is true, but, as I said, rather a puzzle to the tyro.

Many of us are in the habit of using the "acid fixing bath," a common way of making which is to add a mineral acid to a solution of sulphite of soda, and to dose the fixing solution with a quantity of this preparation. Perhaps Mr. C. Welborne Piper will explain in what way this acid bath, which certainly does not reduce density, differs from the solution which he describes as a powerful reducer of density. Mr. Piper says, "If hydrochloric acid is added to sodium sulphite, sodium chloride is formed, and, if the mixture is added to the hypo solution, a fixing bath is produced which acts as a powerful reducer of density." Also, though sodium chloride is undoubtedly produced, sulphurous acid gas is also evolved, and, if this acid be added to the crystals, serious consequences would ensue to the experimenter's lungs if he did not perform the experiment in the open air, or under a strong draught into a chimney or a fume chamber.

I think a useful addendum may be made to the editorial remarks on stereoscopicity—a sort of "rider" to the axiom given that "the nearest objects should never be more than thirty feet distant." This is a most useful hint to keep in mind, as many an unsuccessful slide would prove; but, if a view or an object has to be taken, whatever the distance of the nearest object, and that should prove to be outside the thirty feet limit, all that will be necessary to do, and still obtain stereoscopicity, is to take the view at two exposures, removing the camera between whiles from a few inches to a foot or two, at right angles to the axis of the lens, of course. This is quite an easy thing to do without any apparatus if care be taken to level the camera. There is, however, always one peculiarity about such views, they give the effect of having been taken from small models rather than from nature itself.

There has been a recrudescence of copyright questions lately, with regard to which, however, space will only permit me to refer to Mr. Gambier Bolton's suggestion in the ALMANAC. This, it will be remembered, is to the effect that, in granting permission to use a photograph, a stipulation should be made that the block be given up. The advice is good from the copyright-owner's point of view, but is it policy? I have reasons for knowing that some editors, who behave most honourabiy in questions of copyright, feel v ry sore about the stipulation—just though it is—that a picture must only be used once. Will it not produce still further irritation to suggest, as such a stipulation undoubtedly does, that the editor cannot be treated as an honourable man? Personally I should not, if I had a copyright to dispose of, for one moment think of adding such a stipulation to an agreement. The remedy in case of re-use is in the photographer's own hands. I know of a case now or recently pending when a newspaper sold such a block to an innocent purchaser, who utilised it in another newspaper, believing in all good faith that the permission given by the original block-producer was good. At once the owner of the copyright put himself in communication with the innocent pirate, claiming heavy damages. The second user does not feel at all happy in the matter, or did not when I last heard of him.

FREE LANCE.

FOREIGN NEWS AND NOTES.

Photography in Natural Colours.—Ever since 1873, M. de Saint-Florent has been experimenting with the production of photographs in natural colours upon paper, and he recently described before the Société Française his last process, in which he has used the ordinary celloidin paper of commerce. The paper should be exposed to sunlight for from 80 to 100 seconds, till it has assumed a reddish-black colour, and then immersed for ten minutes in a bath composed of—

Alcohol (36°)	100 c. c.
Glycerine	7 grammes.
Tincture of iodine (one per cent.)	7 „
Strong ammonia	6 drops.

The alcohol may be the ordinary methylated spirit. The paper should be dried in the dark, and then exposed under a coloured transparency till the colours appear, which requires about an hour in the sun, and it should then be fixed in a six or ten per cent. solution of hyposulphite of soda. In this bath the colours show up very brilliant, and then pale to a lemon-yellow, when the print should be rapidly washed and dried in the sun. The colours will then be revived with all their intensity. If there is no sun, then the print should be surface-dry, and placed in front of a bright fire. It is stated that the colours are permanent.

Another Process.—M. Graby, in a recent paper to the Académie des Sciences, also described a process by which he states that permanent results are obtained. The paper may be exposed wet or dry, and it is practically a modification of Veress' and Kopp's process, suggested by them in 1890 and 1891. Kopp used a mixture of zinc chloride and sulphuric acid to form the subchloride of silver, and then bathed the paper in a mixture of potassium bichromate, cupric sulphate, and mercurous nitrate, and fixed the colours by using a dilute sulphuric acid bath. Graby exposes gelatino-chloride paper to light till it is violet, and then immerses it in a four per cent. solution of hydrochloric acid, and dries it in the light, and then immerses in a one per cent. solution of potassium bichromate, dries it, and exposes to light till the gelatine has become quite insoluble, and then it is sensitised in a bath composed of—

Water	70	c.c.
Nitric acid	5	drops.
Mercuric nitrate	2	c.c.
Hydrochloric acid	3	„
Sulphuric acid	1	„
Chromic acid	1·5	grammes.
Soda alum	3	„

This paper is exposed damp, and gives good results. To expose the paper dry, it is first exposed till violet, then immersed in the acid bath in daylight till blue, then in the bichromate bath, then in a bath of nitrate of mercury, and dried and exposed, and, after exposure, immersed in a bath of acetate of lead, and, finally, transferred to a sheet of paper exactly like carbon tissue, and finally passed through a bath of salt and mercuric chloride. M. Graby states that red and blue are due entirely to the subchloride of silver, and can be seen by transmitted as well as reflected light at any angle, and, as he calls them, the chemical colours are similar to the colouring matters of flowers. A piece of silver exposed to the vapour of chlorine in the dark becomes first yellow, then red, and then blue, in proportion to the amount of chlorine that it absorbs, and, if this blue chloride be exposed to light, it will turn first red and then yellowish-white in proportion to the loss of chlorine. Silver chloride by itself will give only a dirty yellow, but a mixture of a chromate and silver subchloride will give a golden yellow complementary to the blue violet, and this is reduced by light to all shades of yellow. The yellow is thus, it is said, composed of chromic acid or a chromate, and, on being washed with acetate of lead, is converted into insoluble lead chromate. Blue and red being due to a definite amount of chlorine combined with the silver, it only remains to ensure this, which is done by the mercuric chloride for these colours to be fixed. White was the most difficult colour to fix; but, as this was formed by the bleaching of the blue silver chloride, or, in fact, by the disassociation of the chlorine and silver, and chlorine rendered soluble, the gelatine rendered insoluble by the action of light on the bichromate, it was quite sufficient to treat the paper like carbon tissue to obtain pure whites.

A "Blue Light" Hospital.—According to the *Kölnische Zeitung*, Dr. Niels Finsen, of Copenhagen, has just founded a hospital in which the patients are placed in rooms illuminated entirely by blue and blue-violet light, which is to kill the bacteria. The fatal effect of sunlight upon bacteria has been pointed out by many, notably Downes and Blunt, Dudaux, Arlsing, Dieudonné; and many of our readers will, doubtless, remember a paper read before the Royal Photographic Society by Marshall Ward upon this subject. Dr. Finsen has constructed a condenser with two double-convex lenses, of seven inches diameter and fifteen inches focus, which are placed in a metal cone, the space in between being filled with a solution of methyl blue, which cuts off all the heat rays and allows only the blue and blue-violet to pass. He has also constructed a somewhat similar condenser for use with the electric light, and he has found that the bacteria on a Buchner's culture plate are entirely killed in seven minutes in this apparatus, whilst in ordinary sunlight it takes about an hour and a half. This method is used by Dr. Finsen particularly for skin diseases, and the patient has to wear a glass shape, which presses the blood away from the affected part, for he finds the blood does not allow of the passage of the actinic rays.

A Standard Light.—Violle, who is so well known for his researches for a light unit, and for his suggestion of the use of incandescent platinum for this purpose, now points out that in acetylene we have a valuable material for a standard light. Violle has had made a model lamp, in which the acetylene passes through a conical opening, taking up the necessary quantity of air, and then passes into a tube, where the two are thoroughly mixed, and thence by a steatite bat's-wing burner, where it is burnt. The whole arrangement is placed in a box, one side of which is provided with a kind of iris diaphragm, which enables more or less of the flame to be cut off so as to give a definite number of candles. With a pressure of 0·3 m. of water, the full flame gives over one hundred candle power with a consumption of fifty-eight litres of acetylene per hour. This is about twenty times more than ordinary coal gas, and about six times greater than a Welsbach. The spectro-photometer also shows that it is very similar to the melting platinum.

SILVER INTENSIFICATION OF COLLODION EMULSION NEGATIVES.

I.

Although silver intensification has practically fallen entirely out of use for gelatine plates, I have always considered it one of the best, if not *the* best, method, even for gelatine when properly used, though I dare say it was the care required in its "proper" employment that threw it into disfavour. For collodion negatives the difficulties that surround its use with gelatine disappear, and it remains undoubtedly the best method of increasing the density of the first image produced by development. Of course, for the extreme density required in process negatives, it is customary to supplement the use of "acid silver" intensification by other means which give the result more rapidly and with less trouble; but, when everything, including the bath, is in proper condition, there is, or should be, no difficulty in obtaining complete opacity by this means.

But with collodion-emulsion negatives the case is somewhat different, as such films respond far less readily to the action of acid pyro and silver than do those prepared in the bath. It is not easy to fully account for this, or to decide whether it is the result of the different formation of the sensitive salt, the different character of the image produced by alkaline development, or both, or whether other causes altogether operate. If we suppose that the formation of the sensitive layer in the presence of a large excess of silver nitrate, as in the wet process, is the cause of the easier intensification of such plates, then we might expect the difficulty to be overcome in the case of emulsion by similar means. It is, however, impossible to apply precisely similar treatment, since there is a limit to the excess of silver allowable in an emulsion even if used, and, though an emulsion prepared with excess of silver will, as a rule, give density more readily than one made under reverse conditions, it is by no means the invariable rule.

There is one circumstance that has been supposed to favour the theory that it is the large excess of silver, represented by the bath, that causes the difference, namely, that if an emulsion film, containing an excess of bromide, be treated, without previous washing, with a solution of silver nitrate, it is not only more rapid, but gives density more readily, than the same emulsion simply washed; but the reason of this, I take it, is to be found in the fact that a portion of the sensitive film is formed under wet-plate conditions, and that it is this portion of the bromide that gives the increase of density. If the same emulsion be thoroughly washed, before treatment, with silver, and again as thoroughly washed (to remove the excess), the most probable result, on development, will be a foggy or dirty plate, without the slightest addition to the density, but most likely the reverse.

The presence of iodide of silver in the wet plate has been adduced as the reason of the difference; but, although it may have some influence in altering the character of the image, it produces little or no difference in increasing the degree of density under similar conditions, if, indeed, it does not rather tend to decrease it. The densest negatives I have ever seen produced by any process, short of intensification with bromide of copper and similar means, were made with a simple bromised collodion sensitised in the bath, so that it can scarcely be said that iodide of silver is essential to density. Again, in the case of an emulsion containing a minute trace of iodide, the image, though blacker and clearer, is, if anything, under similar circumstances, thinner.

That it is not the character of the silver deposit produced by alkaline pyro is shown by the behaviour of emulsion films under physical development alone. In the old days of collodion dry plates prepared with the bath the amateur had the choice of either method, chemical or physical, of development. And, if the former or alkaline pyro—the only form then known—produced the result more rapidly and with a shorter exposure acid pyro, and silver, or gallic acid, and silver were generally supposed to yield the better images where the longer exposure and more protracted development were not an objection. But, if acid development be applied to a collodion emulsion film that gives absolutely satisfactory results with alkaline pyro, not only will the exposure and development be protracted to an extraordinary degree, but the resultant image under the most favourable circumstances will be thin, poor, and altogether unfit for any useful purpose. It cannot therefore be said that it is the nature of the chemically developed image alone that causes it to resist silver intensification, although, as I shall notice later on, it does behave differently.

Whatever the cause, the fact remains that collodion emulsion films are less amenable to silver intensification than those prepared in the bath. At the same time, for most ordinary purposes, alkaline development is capable of producing all and more than the density required, as, for instance, in ordinary negative work or for lantern slides and transparencies. But for line and general process work, while the degree of density obtainable by alkaline pyro alone is generally insufficient, the tendency to filling up the fine lines renders it undesirable to push it beyond a certain point, and to trust to silver or other means for getting the vigour required.

I have said in the early part of this article that silver intensification is undoubtedly the best method for collodion negatives, and, if this is the case with wet collodion, it is doubly so with emulsion, on account of the difference in character, constitution, and behaviour of the alkaline developed image. Any one who has had experience with wet collodion as well as with collodion emulsion films will know how differently the two classes of image behave under the action of such intensifiers as bromide of copper, lead, or mercury, and how difficult it is sometimes to get a satisfactory result when applying any of these to the alkaline developed image. Then, again, if development be carried sufficiently far with alkali alone to produce a solid basis to work upon, it will be found that there is sufficient reduction in the lines to cause these to fill up under intensification; and, as the reduction that causes this filling up is in the body of the film, it cannot be removed without greatly reducing the general density.

But, if the development with alkali be arrested when there is a fairly strong image with absolutely clear lines, silver intensification enables that image to be built up without the slighest danger of affecting the clear lines; for, even if these have received sufficient impress of light to bring them within the action of the alkaline development long applied, the intensifying solution will be perfectly powerless to do anything but add to the image already visible; and, if the proportion of acid used be sufficient to prevent abnormal reduction, it is practically impossible to fog or fill up the lines.

From what has been already said it may be gathered that the degree of density generally obtainable with pyro and silver will be insufficient for "process" work, but the use of that method, besides adding to the initial density, converts the image into one more resembling the wet-plate image, and which therefore behaves with greater certainty under the action of the more powerful intensifiers mentioned. For ordinary negative work, or for transparencies, of course silver will more than perform all that is needful; indeed, where this is possible, as it should be with any good emulsion, with alkali alone, I have always advocated the use of silver intensification if only slightly, for the crispness it gives to the image and the brightness of tone.

There is, of course, a limit, as in the case of wet plates, to the degree of density obtainable with pyro and silver, and it will be a narrower one in the case of emulsion plates; but, practically, this is of little moment, for, by the adoption of other means, an almost unlimited amount of intensity can be got before resorting to the ordinary lead, copper, or mercury methods. Thus, after getting all the density possible with one application of pyro and silver, if the image be converted into bromide by means of weak hydrobromic acid or similar means, but *not* with bromide of copper, and, after exposure to light, redeveloped with alkaline pyro, it is amenable to a second, and, owing to a greater thickness of silver, a stronger reintensification with silver. The mere redevelopment, by altering the colour of the image, will prove sufficient for many purposes, but after that there are almost unlimited possibilities with pyro and silver, as the operation can be repeated again and again, the only conditions to success being that the lines are perfectly clear to start with, that the plate is thoroughly washed between the different operations, and that the collodion film will bear the protracted treatment. On these points I shall say a word or two presently.

Meanwhile, the first care should be to obtain a suitable image to start with, and this should be not necessarily boldly defined at this stage—for collodion emulsion images differ very greatly from either gelatine or bath plates in this respect, and an almost invisible image if of the right kind will often intensify up to great strength without difficulty—but it must be well exposed and clean. Under-exposure is fatal to success, as, although the image may be clean, it will possess no intensifying power. Over-exposure is not so dangerous, but it is to be avoided, and where it is suspected a full dose of bromide should be used in the developer. The sort of image is required that comes up with moderate rapidity with a minimum quantity of alkali.

W. B. Bolton.

ENLARGED NEGATIVES.

[Read Before the Newcastle-on-Tyne and Northern Counties Photographic Association.]

Once upon a time no self-respecting photographer thought of going out with a smaller apparatus than 10×8, but the quarter-plate hand camera has altered all this, and the man who does not use this ubiquitous instrument probably adopts a half-plate stand camera. There can be very little doubt that the small-size instrument possesses enormous advantages over the lordly 15×12, without any serious disadvantage on the other side of the ledger.

There is the self-evident saving in weight and expense, which need not be dwelt upon. In addition to this, consider the optical facilities which the user of the small plate has at command. By the adoption of one of the recent anastigmatic lenses, covering sharp to the corners of the plate in one plane at apertures ranging from *f*-6·5 to *f*-9 subjects impossible under other circumstances are easily secured, whilst a whole-plate of similar make would require stopping down to, say, *f*-22, to obtain sufficient depth of focus, and the 15×12 would necessitate a smaller aperture still. Of course, it may be pointed out that the user of the large camera has an advantage in the increased power he possesses of focussing one plane of his subject sharp and the rest more or less diffused, but it is not every worker who can afford anastigmatic lenses of large size, and the ordinary R.R. at medium apertures will certainly not cover the plate sharp, even in one plane, and nothing looks worse than sharpness in the centre and fuzziness at the edges of the print; whereas the possesser of a quarter-plate can, by using his lens at open aperture, get a small amount of diffusion wherever he requires it, and enlarging will do the rest.

For serious picture-making the question is to enlarge or not to enlarge, and the balance of advantage is all on one side. Granted that the expense of large plates will train us to be careful in our work, this is counterbalanced by the fact that the physical strain of lugging the apparatus about will react upon us mentally, and probably lessen our chance of putting our best efforts into the composition of our pictures. Over and above all this there is the facility which enlarging gives us of altering the character of the finished print in whatever direction we may feel the subject demands.

Enlarging may be divided into two branches: Enlarging direct on to bromide paper, and making enlarged negatives and printing from such negatives by contact. Bromide enlarging has three disadvantages, or rather restrictions—we are restricted as to choice of colour, surface, and kind of negative. Nevertheless, it is an exceedingly valuable process for black-and-white work, provided we have the right kind of negative, viz., one which has a medium range of gradation, is free from stain and not too dense. Moreover, it has the special advantages of being cheap and easily worked.

But enlarging by means of enlarged negatives puts into our hands such facilities as more than compensate for the increased trouble, difficulty, and expense that the process involves. Amongst these may be mentioned the fact, that we can alter the character of the final print as we may desire, producing a soft print from a hard negative, or, *vice versâ*, we can suppress or accentuate, and so make a picture out of "the usual thing," if we know how; and, by the single-transfer carbon process, we may choose our colour and surface to suit the subject.

Further, by the use of a rough-surfaced paper, we may do away with the grain, which is inseparable from the operation of enlargement. In addition, we have the absolute permanence which carbon and platinotype yield us.

This, by way of preliminary, must suffice; and we will now consider ways and means of making an enlarged negative. These are numerous, indeed too numerous, to be done justice to in one night.

The first step is the production of a positive or a transparency from the original negative. Much has been written about the supposed grainlessness and other advantages of a carbon transparency. Undoubtedly, the carbon process brings out all that there is in a negative, but it is at the expense of contrast, and it is certainly not so free from grain as other processes. There is also the disadvantage, that it has to be transferred to a glass plate coated with a bichromated gelatine film, which plate has to be dried in the light, and, in drying such a plate, there is great difficulty in keeping it free from dust, which, in the long run, produces something more than grain. Now, for printing on mezzotype and Venus papers, or in carbon upon rough-tinted etching papers, a decidedly hard negative is urgently called for, and such a negative is not easily made from a carbon transparency, which is usually what we call flat. In our own practice, we much prefer a well-exposed bromide lantern plate, developed to considerably more density than would be thought correct for a lantern slide using ferrous oxalate, followed by a citric or hydrochloric acid clearing solution. We recommend this developer because it gives an image without colour or stain, and it is thus easier to calculate exposure. A good lantern plate, well exposed, will register every gradation of the negative, and will be more free from grain than carbon, whilst, if a particularly grainless result is desired, a chloride plate may be used. This process is also convenient to the worker with small means or little daylight at his disposal. A lantern-sized transparency may be made by reduction from, say, a half-plate negative, and enlarged by any one who has access to an optical lantern, whereas to enlarge from such a negative direct involves the use of daylight, or a costly eight-inch condenser. A gelatino-bromide transparency also gives us a control over the result, which it is difficult to obtain by other means. Thus we may increase or reduce contrast by varying the exposure and development of the transparency, and we may reduce or intensify locally. We may also print a separate cloud transparency and bind the two together, and thus secure clouds in the enlarged negative, and so do away with the difficult and unsatisfactory operation of printing in clouds, in platinotype on carbon.

We have hitherto spoken of transparencies made by contact or reduction, but there are other ways. We may make an enlarged transparency on an ordinary slow plate and make the final negative by contact. This is open to the objection that, if the original is grainy, the grain will be magnified, and that it is expensive; but, on the other hand, the transparency being on a large scale, it is much easier to work up and get rid of imperfections. In this case the back of the transparency is coated with matt varnish and worked upon with the pencil and stump, and the final negative may be made on albumenised or thin bromide paper, which may be again worked up. In the case of a bad original negative, and perhaps in nearly all cases, an even better course (for those who have a large camera) is to make an enlargement on smooth bromide paper, which is worked up until the desired effect is attained, and then to photograph the enlargement. In this case it is best to make the enlargement bigger than the final negative is desired to be, or in other words, photograph it down to a smaller size, thus, enlarge to 19×16 and photograph down to 12×10.

Having dwelt upon the transparency, we must next consider the production of the negative. An enlarged negative is only a means to an end, and is not a thing of beauty in itself. If enlarged much above two diameters, it may be hard and look as grainy as a stone wall, and it will never win the fervent approbation of the technical enthusiast; but what matters it if it gives a good print? Some of us admire negatives so much that we have no admiration to spare for pictures.

First let us look at the type of negative required. If we are to use the single-transfer carbon process and a tinted rough-surface etching support, or any of the rough-surface silver processes, such as Venus or mezzotype we must have a really hard negative. If the negative is very granular, a rough paper will entirely hide this, and a perfect print will result. The amount of grain in the negative will decide the amount of roughness which is required in the print. If it is wished to print in platinotype or in carbon with a white support, the negative need not be so hard, but it is best to have it of such a density as to stand three tints of the actinometer. Of course, if the right quality of negative is not attained, we can have recourse to reduction or intensification, or both.

Having now considered the transparency and the type of negative to be aimed for, it is time to come to the actual enlarging, which may be done by either artificial or day light. Daylight is cheap, and demands no extra apparatus beyond a darkened room and an easel; but, on the other hand, it is not nearly so certain, on account of eccentricities in the supply. All that is required is a shutter, with an aperture for the positive, which is backed by a white reflector at an angle of forty-five degrees, a bracket, to sustain an ordinary camera and lens, close up to the positive, and an easel to receive the image. Daylight enlarging boxes are to be bought or made, but they are not to be recommended, for the simple reason that we cannot get at the image to do any shading or dodging, which is one of the tools we ought always to have in reserve. In addition, when we can see the image, it is so much easier to estimate exposure. For these reasons the easel form is much to be preferred.

Artificial light is much easier to work with than day light, and probably an apparatus of the Cantilever type, using incandescent gas as the illuminant, is the most convenient; but a home-made wooden box to contain the condenser and gas-burner, and a bellows front to sustain the lens, will accomplish all that can be done by the more expensive commercial apparatus. For those who cannot devote a room to the purpose, the apparatus must be made portable, and used on a table. A one-inch deal plank may be used as a baseboard, the lantern at one end and the easel to slide along the plank. Guiding rails should be fitted to the plank, preferably of triangular shape, thus  , and the easel on a solid foot, with grooves to fit the rails, so as to secure parallelism. Let the rails and grooves be well black-leaded, so that the easel may slide freely, and let the centre of the optical system coincide with the centre of the easel.

Equipped with such an apparatus, we may proceed to enlarge with ease and comfort. It may be here pointed out that most commercial enlarging lanterns are fitted with a portrait lens, which will probably be found not to cover the plate to the edges, and a lens of the R.R. type, of similar focus, should be substituted. It may also be pointed out that, if it be necessary to stop the lens down, the light will need to be centered afresh for each change of stop, *i.e.*, centered as regards distance from condenser.

For those who wish only to make an occasional enlargement a rough-and-ready apparatus may be employed. The baseboard and rails may be left out of the scheme, and a couple of tailors' inch tapes stretched across the table will suffice to obtain parallelism, whilst a large printing frame may supply the place of an easel. The ordinary optical lantern may be used to project the image, but it should have a special front fitted to take a R.R. lens, or the front may be removed, and a camera and lens, with the positive occupying the place of the focussing screen, pushed up against the condenser, and the junction covered up with a cloth, to prevent light escaping. Finally, the lens should be fitted with a deep yellow or orange glass cap, so that the sensitive plates or paper may be put into position with safety and certainty, the image on the screen supplying its own guide. If the ordinary lantern is to be used, it is better, however, to have it so altered as to take a four-inch condenser for slide projection, and also one of about five and a half inches so as to cover a quarter-plate. We may say, that some of the negatives shown to-night were made from ordinary lantern slides, and prints from two of them were hung both at the Dudley Gallery and at the Pall Mall Exhibitions.

The illuminant recommended is incandescent gas, but oil, acetylene, limelight, or a "focus" incandescent electric lamp may be used. If limelight be employed, the light is really too rapid for convenience, unless very slow plates be used. As regards the actual negative-making much might be said, but the operations are purely photographic and well within the capacity of the average worker. The ordinary plates may be used, but a photo-mechanical or lantern emulsion is to be preferred, on account of the greater latitude in exposure and ease in getting density. There is also much to be said in favour of bromide paper as a medium for making large negatives. It is very cheap, easily developed, easily stored, does not smash, and the paper affords a splendid surface for working up. A thin smooth paper should be selected. Recently Messrs. Wellington & Ward have introduced a negative paper, which is of special excellence, almost free from grain, half the price of glass plates, entirely free from halation (here it may be mentioned that, if plates be used, they *must* be backed) and apparently rapid enough for shutter exposures in the camera. For our special purpose of making enlarged negatives this rapidity is its only drawback. It is not so easy to attain full density as one could desire, but a week's trial is not long enough to enable one to master all the peculiarities of a new emulsion. We will make further experiments and communicate the result to a future meeting, but meanwhile it may be said that pyro and ammonia seems the easiest developer to work. It appears to us that the only fault of this developer is its staining tendencies, and that therefore the preservative should be meta-bisulphite of potassium, and that a formula strong in both pyro and ammonia, so as to quicken development, is most likely to succeed. To the experimentalist we would suggest that Beach's pyro and potassium is also a very suitable formula, subject to this reservation, viz., that the emulsion does not take kindly to a carbonated alkali and is apt to blister. This, however, is easily prevented by the addition of a little methylated spirit to the developer. We have up to the present got the best negatives by a combination of glycin and hydroquinone, plus a drachm of spirit to eight ounces of developer, but the action is rather too slow. A strong fixing bath also tends to blisters, but a one-to-eight solution with the addition of a drachm of spirit to the pint of solution will make this perfectly safe. We would very strongly recommend this negative paper to your attention, and, if the makers could only see their way to make a slower emulsion, it would be an ideal basis for enlarged negatives.

To conclude. As 15×12 paper and plates are both expensive, it is well to put up a test strip, and expose and develop it before risking the larger size.

Jas. Brown.
Wm. Thompson.

LONG-FOCUS AND TELE-PHOTO LENSES.

Read before the Edinburgh Photographic Society.]

On no subject is there more confusion of thought among amateur photographers than that of long or short-focus lenses, and in none of the elementary handbooks is the matter clearly explained. It is obvious to every one that a lens of short focus must be used when one cannot get far away from the object to be taken, and one of long focus when one cannot get near it; but not many can explain why one lens is better than another when one has the choice of any distance.

The rule often given—that the focus of the lens used should be equal to the distance at which the photograph would naturally be viewed—seems to be scientifically correct, but there are many cases in which a photograph does not produce at all the same effect on the eye as the original view did. Thus a house will look well from a point of view near enough to diminish the roof very considerably, since it is quite apparent to the eye what the real size of the roof is; but, when the scene is represented on a flat surface, this is no longer evident. Thus a lens of longer focus will give a better-balanced and truer picture. But the most important case is the one which comes up so commonly when one is photographing in such a country as Norway or Switzerland. Suppose we are taking a cottage, with a distant range of mountains as a background, the ordinary lens, with a focal length about equal to the diagonal of the plate used, fails entirely, as is well known, to give the effect of the mountains; they seem ridiculously small in comparison with the objects in the foreground. Why this is so is a very interesting question, which need not be discussed here. It is universally admitted by painters that such a background must be exaggerated to give the same effect as the reality.

To bring background and foreground into a better proportion, it is plain that we have only to go back a little, say, twice as far off the cottage. It will then appear half the size, while the mountains, being so far away that twenty yards further makes no difference, look just as big as before. But we shall probably, unless using a large size of plate, have reduced the foreground so much in size that the details are not visible, and, though such a picture, taken, say, with a quarter-plate camera, may make a good lantern slide or enlargement, it will not look well as a print. Let us now, keeping at the greater distance, substitute a lens of twice the focal length of the one first used. The cottage will be restored to its original size, but the mountains, which have practically been at the same distance all the time, will now appear double the height, and this exaggeration, for such it really is, will be found to give a truer impression of the original scene. In short, then, the lens of long focus enables us to go further back from the foreground, and thus bring it into better proportion with the background without losing the details by reduction of the size; or, to put it otherwise, it enables us to increase the size of objects in the distance, while those near at hand can always be left the same size by merely shifting the camera a little further back. There is, of course, a danger of overdoing this magnification of distant objects in photography just as there is in art. The sun and moon, for instance, which most painters represent as two or three times the real size, will be found in the illustrated papers to be about ten times too big. It is not possible to make a hard-and-fast rule, but a focal length of twice the length of the plate used will not be too great for distant mountains. In some cases, especially with a quarter-plate camera, an even longer focus will be an advantage.

The abuse of the principle is well seen in the photographs taken by the recently invented tele-photographic lenses, by which a greatly magnified picture can be got in an ordinary camera. There are, undoubtedly, many uses, scientific and artistic, for such a lens, but many of the examples shown are monstrosities, in which perspective disappears altogether. Thus a distant view of a cathedral brings it near enough to show every detail, but makes the west front seem parallel to the nave instead of at right angles to it, owing to the entire lack of perspective, while a landscape shows the trees that are apparently close at hand about the same size as those in the distance. J. C. Oliphant, M.A.

INCANDESCENT MANTLES.

[Cantor Lecture delivered at the Society of Arts.]

Leaving the question of the burner by which the heating power of the coal gas is to be developed, we next come to the mantle, and in all the most successful forms this is made by taking a cylinder of cotton net, eight or nine inches in length, which is puckered up and sown together at the top with asbestos thread, a loop of the same material, or of thin platinum wire, being fixed across the constricted portion to form a support by which the mantle may be held by the carrying rod, which may be either external to the mantle or arranged as a central pin, as is more often the case. Whilst the external support has the disadvantage of casting a shadow, the internal pin has the drawback of occasionally interfering with the combustion taking place in the interior of the mantle and leading to carbonaceous deposits.

The cotton net, having been prepared in this way, is then soaked in a solution of the nitrates of the metals, the oxides of which are desired in the finished mantle, and, as each cotton fibre consists of a microscopic capillary tube, the liquid is sucked in by the action of capillarity until the tube is entirely filled, and when this point is reached further soaking is a drawback rather than an advantage, as most of these metallic nitrates have a distinct acidulous tendency, which weakens the fabric of the cotton, and renders it delicate in the handling before burning. The cotton, having been soaked, is then wrung out, and this gets rid of a good deal of the solution clinging to the exterior, but does not affect the portion which has been taken in by the fibre itself. The cotton is then stretched over a conical mould and dried, after which it is ready for the process of burning off. This consists in burning away the organic matter, and converting the nitrates present into oxides with evolution of oxygen and oxides of nitrogen. In doing this, the heat of an atmospheric burner is first applied to the constricted portion at the top of the mantle, and the cotton burning partly at the expense of the oxygen of the air, and partly of the oxygen from the nitrates, the flame spreads downwards, and the evenness and shape of the mantle to a great extent depends on the regularity with which this combustion takes place. During this portion of the action most of the fabric burns away, but leaves behind a certain amount of carbon, which has to be burnt off by the judicious use of a blast blowpipe and atmospheric burner applied to the interior.

During the process of burning off the mantle, you have a cellulose tube filled with the crystallised nitrates of the metals used, and, as the cotton begins to burn, the nitrates give up oxygen, and become fusible nitrates, which, in their semi-liquid condition, are squeezed together and rendered coherent by the rapid shrinkage which takes place during the burning of the organic matter, and, as the action continues, the nitrates become oxides, and rapidly lose their fusibility, with the result that, by the time the last trace of organic matter has been burnt away, a coherent thread of metallic oxides is left in place of the nitrate-laden thread of cotton.

In the early days of incandescent lighting no process was known of rendering the mantle of metallic oxides sufficiently strong to bear carriage, and the mantle had therefore to be sent out unburnt, and had to be burnt off when it was required; but, as the success of the mantle is almost entirely dependent upon the shape fitting the flame to which it is adapted, and as the burning it to that shape requires considerable practice, this was a very great difficulty, whilst another complication arose from the fact that the metallic nitrates were so acidulous in their nature that the mantles soaked in them quickly rotted away, unless after they had been soaked they were exposed to the action of ammonia gas, which converted any excess of acid into ammonium nitrate, but it was found that this so-called ammoniation rendered the mantles after they had been burnt even more fragile than before, and the reason of this is to be found in the fact that the ammonia gas converted the easily fusible and decomposible nitrates into hydrates, which were practically infusible, so that the pressing together into a coherent mass by the contraction of the organic matter on burning could not take place, and the mantle as often as not dropped to pieces as soon as it was burnt off.

It was, therefore, a great advantage when it was discovered that the burnt-off mantle could be dipped in collodion, *i.e.*, a solution of soluble gun-cotton in a mixture of alcohol and ether, which, when the mantle is drawn from the solution rapidly evaporates and leaves a thin film of collodion, so strengthening the skeleton of metallic oxides that they can be stored and sent from place to place without danger of fracture.

The oxides used in the first Welsbach mantles made in this country consisted of mixtures of zirconia, lanthania, and yttria, or zirconia and lanthania. Not only were these very fragile, but they only emitted from four to seven candle power per cubic foot of gas consumed. After gradual changes and modifications the composition of the present highly successful mantles is 98 per cent. thoria and 2 per cent. ceria, and the average performance of these mantles may be taken as being an emission of sixteen candle power for a consumption of one cubic foot of gas, whilst, if the fragility of the mantle allows it to bring its life to a natural termination, they will last for a very considerable period, the light not showing any serious diminution during the first 500 hours, then gradually dropping away, until at the end of 1000 hours it has lost about 40 per cent. of its original power of emitting light; but it must be clearly borne in mind that any such expressions concerning the life of a mantle are very misleading, as their fragile nature most frequently causes their premature demise from fracture, and, if you took the life of a Welsbach mantle from the general average of all mantles sent out, it would be a great deal nearer 100 than 1000 hours, as our personal experience with these beautiful but delicate fabrics teaches us that many more mantles are lost in the first ten hours of their existence than are nursed up to a ripe old age of 1000 hours.

Little is at present understood as to the causes which lead to the wonderful power of emitting light that these mantles possess, but I think there is little doubt that this must be due to some specific molecular changes which are taking place in the material employed, as, unless this

were so, it would be practically impossible to find an explanation of the fact that the mantle of thoria alone emits practically no light, whilst the addition to it of 1 to 2 per cent. ceria excites the power of emitting light to the high degree found in these mantles.

If mantles are made from any one oxide alone, no very startling illuminating power can be obtained, and the following table shows the approximate value to be got from each oxide when used for mantle-making by itself :—

Illuminating Value of Mantles made from the Following Oxides per Cubic Foot of Gas.

Thoria (commercial)	6·0
,, (pure)	1·0
Zirconia (commercial)	3·10
,, (pure)	1·5
Ceria	0·9
Yttria	5·2
Lanthania	6·0
Erbia (commercial)	1·70
,, (pure)	0·6
Alumina	0·6
Chromium oxide	0·4
Barium oxide	3·3
Strontia	5·5
Magnesia	5·0

Ceria gives a reddish-yellow light.
Erbia, zirconia, and oxide of barium, a yellow light.
Alumina, a whitish-yellow.
Strontia and magnesia, a white light.

From this it is seen that neither thoria nor ceria, when pure, have any particular power of emitting light, but mix with the thoria 1·2 per cent. of ceria, and at once the mixed oxides emit a light fourteen to sixteen times greater than either of the substances used, whilst, on increasing the ceria, the luminosity gradually drops, until equal mixtures of the two give about the light we should have expected from the emissivity of the two constituents. It is generally accepted that the power of emitting light is dependent upon intense molecular activity in the luminous body, and it seems hardly probable that so small a trace of the ceria should have the power of setting up any chemical action which could induce luminosity without the light-giving power being increased by the addition of more ceria, nor is it likely that the combination of so small a trace of ceria with the thoria should last over so long a period as that during which the mantle continues to emit light.

Some interesting experiments have been made by Dr. C. Killing on the cause of luminosity in incandescent mantles, and his conclusions are that it is due to the catalytic action in a state of extremely fine division of the oxide, which is added as an excitant to the skeleton formed by the chief material of the mantle, and he finds that traces of metallic platinum, or iridium, or even gold, osmium, ruthenium, and palladium act in a similar way to the ceria added to the thoria mantles.

There is no doubt that, if the skeleton of thoria be dipped into a dilute solution of platinum or iridium chlorides, small traces of these metals in an extremely fine state of division after heating will be formed on the surface, and that these will have a certain catalytic action, such as glowing when the gas is turned on to the mantle; but I do not think this is any proof that ceria and other oxides of the same character have a catalytic action of the same kind, even when at a high temperature, and I should certainly have expected that, if the catalytic action was the true explanation of the phenomenon, further additions of the excitant to it ought to increase the incandescence, and certainly would not decrease it, as is the case.

Dr. G. P. Drossbach has also made some interesting experiments on the light emissivity of the oxides, and he comes to the conclusion that, when heated in a blowpipe flame, the light-emitting value of the separate oxides is found to be proportional to the formula—

$$\frac{\text{Molecular weight} + \text{Specific gravity}}{\text{Specific heat}},$$

but that with the heavy metals the oxides are gradually reduced and vapourised in the flame, and that these conditions alter if refractory oxides are introduced into the mantle with the reducible ones, as they behave as bases towards them, and allow the formation of compounds having the character of salts.

Another consideration is that ceria is by no means the only excitant that can be used to endow the thoria mantle with the power of emitting light, and it seems far more reasonable to suppose that the admixture of small traces of such bodies as ceria induce molecular changes in the state of the oxides, such as from the amorphous to the crystalline state, a change which may be excessively slow, and which has before been observed to induce high incandescence when bodies capable of undergoing it are being heated.

Another example of the same character is to be found in the case of a mantle made of alumina, which emits no light, but which, on being sprayed or dipped in chromic acid, gives very good illuminating results. In this case, after an hour's heating, as far as chemical examination can tell, all chemical action has ceased, yet the power of emitting light continues for many days, and cannot therefore be due to the chemical action.

The colour emitted by the mantle varies greatly with the oxides of which it is formed, showing that specific alterations in the rapidity of the luminous vibrations are caused by alterations in the composition of the mantle. Nothing could be more marked than the difference between the warm pinkish-yellow light of the Sunlight mantle, which is due to the incandescence of oxides of zirconia and alumiua, or alumina alone excited by oxides of chromium, and the cold greenish-blue light of the Welsbach mantle.

Lighting by means of incandescent mantles is now assuming such important dimensions that it behoves us to pay attention to every point in dealing with it, and it will probably be found that the colour of the light emitted by such combinations as those at present utilised in the Welsbach mantles will have a distinctly injurious action upon the eyesight when continued over any long period of time. My own opinion with regard to artificial illumination is that it is an absolute necessity in choosing a light by which we are to work that it should be essentially different from ordinary daylight, and should be as free as possible from those actinic rays which nature so largely utilises in sunlight for her chemical work. It is manifest that nature intended the eyes to be used during the hours of daylight, and that the strain on the optic nerve should be relieved by the periods of twilight and darkness. We can, however, without any great fatigue to those beautiful and delicate instruments, the eyes, continue to use them for some hours longer when the artificial light which we employ is of a soft character, and poor in actinic rays, such as is given by candles and oil lamps, or the gas flame, but I fear that, when we continue to fatigue the eye with an artificial light, rich in violet and ultra-violet rays, in the course of a generation or so, the result of that fatigue of the optic nerve will begin to make itself manifest in the gradual deterioration of eyesight.

Very interesting experiments have been made by Professor Crookes, on the difference in the light rays radiated by the Welsbach mantles and in the rays obtained from the Sunlight mantle. These mantles, when under experiment, were burnt in a chimney which had a window of quartz in it opposite the brightest part of the incandescent mantle, so as to allow of the free transmission of all ultra-violet rays of light, whilst the spectograph in which the spectra were photographed had a complete quartz train consisting of condensers, two double prisms, collimator, and object-glass. Under these conditions photographs were taken on Edwards's isochromatic films, the experiment being carried out under such similar conditions as to be strictly comparable. Having so arranged the burners and the pressure of gas as to get the best light from each mantle, photographs of the spectra were taken, and, in order to fix the wave-lengths of any particular part, a spark spectrum of a standard alloy, the lines of which had been carefully measured, was impressed on the plate immediately after the artificial spectrum was photographed. Working in this way, it was found that the extent of invisible radiation in which the Welsbach mantle exceeds the Sunlight mantle is largely comprised between the wave-lengths, 3450 and 3850, the total ultra-violet spectrum of the light of the Welsbach mantle being comprised between wave-lengths, 3450 and 4000; whereas, that of the Sunlight mantle is comprised between wave-lengths, 3850 and 4000.

Arguing from these experiments, Professor Crookes points out that "it is considered by authorities that light more than normally rich in violet and ultra-violet rays is injurious to the eyes. They contribute in time to a partial destruction of the fibres of the crystalline lens, and when excessive they produce erythema and symptoms resembling those of sunstroke. Workmen in electric light works, if frequently exposed to powerful arc lights, are affected in this way. It is not, however, desirable that the light should be too rich in yellow rays, as these temporarily destroy the erythropsine—the photo-sensitive substance of the retina—producing great fatigue of the nerve, and requiring darkness for its reformation and restoration of normal vision. This destruction and reformation is a natural accompaniment of the ordinary exercise of sight, but, as the yellow rays are most active, it is advisable that they should not be in excess. For these reasons the best form of artificial light is one containing little or no ultra-violet rays, no excess of yellow rays, and just sufficient red light to communicate a warm, pleasant tone to the surrounding objects," and he comes to the conclusion that "the injurious effects of artificial lights on the eye being principally attributable to the invisible ultra-violet radiation, the Welsbach light may be considered to be 2·5 times as harmful as the Sunlight mantle light."

It is manifest, however, that in ordinary practice the glass of the chimney and globe will cut off most of the noxious rays, whilst daylight is far more actinic than the light emitted by the mantle.

In order to, as far as possible, counteract the injury and discomfort caused to the eye by such intense centres of illumination, it becomes necessary to use globes to obtain a better distribution of the light, and at the same time a protection to the eye; but, in gaining this advantage, a considerable sacrifice is generally made in light. For ordinary purposes ground-glass, opal, or frosted globes are used, whilst in many houses these globes are made in pink-tinted glass to as far as possible neutralise the ghastly effect which the Welsbach light gives to the complexion. With all such globes the loss of illumination is considerable, and the diffusion of the light far from satisfactory, but this year has seen the introduction of a diffusion globe based on an entirely different principle,

and which, with our present tendency towards small centres of high intensity, becomes simply invaluable.

These globes, designed by Psarondatri and Blondel, and lately introduced under the name of holophane globes, give us the power not only of correcting the irregular distribution of light from the mantle and bringing the maxima of rays down to the working angles, but also make the surface of the globe the light-distributing medium.

In order to do this, the globe is made of clear glass, so moulded that the exterior consists of horizontal lines, of prismatic form, running round the globe, whilst the interior is covered by vertical lines of prisms running from the top to the bottom.

If the globe only had the horizontal prisms around it, the source of light in the centre of the globe would appear as a vertical band of light, as is seen in the Fredureau globe, whilst, if the vertical prisms only were present, the light would be drawn into a horizontal band in the same plane as the mantle, but the combination of the two draws the light evenly over the whole surface of the globe.

The horizontal prisms are so moulded as to deflect downwards, the excess of light otherwise escaping upwards; this gives an increase in illuminating power over the working angles, whilst the large surface of emission makes the light pleasant, instead of irritating, to the eye.

In order to ascertain how these globes compared with those most generally used with Welsbach burners, I made a long series of tests on the radial photometer as to the absolute gain or loss in direct illumination afforded by their use.

In making these experiments five observations were taken with the unshaded mantle, then ten with the shade that was under trial, and immediately after five more with the unshaded burner, so that for each globe a separate set of ten observations with the unshaded as well as the shaded light were obtained, and the percentage loss or gain calculated from the average results. Observations having in this way been made for the angles below the horizontal, the results indicate the absolute gain or loss due to the shade or globe at that angle. It would be unnecessary, and indeed confusing, to give the enormous mass of figures obtained in this way, and the following table gives a summary of the mean loss or gain in light due to the globes used at angles between the horizontal and 45° below it:—

PERCENTAGE GAIN OR LOSS OF LIGHT DUE TO USING VARIOUS GLOBES WITH A WELSBACH MANTLE.

Globe.			
Holophane—tulip shape	gain of	12·3	per cent.
Holophane—conical	,,	13·1	,,
Holophane—conical pink	,,	1·1	,,
White opal globe	loss of	7·5	,,
Ground-glass globe	,,	12·4	,,
Frosted glass—tulip	,,	11·2	,,
Frosted glass—pink	,,	23·2	,,
Pink opal globe	,,	34·1	,,

These results not only show the great gain which is obtained by the use of the holophane globes, but also bring out in the clearest possible way the serious loss of light involved by the use of pink-tinted globes and shades.

It must not be supposed for one moment that these figures impute a power of creating light to the holophane globes. If the light emitted in every direction was to be taken, a small total loss would be found due to the absorption of some light by the glass, but the angles at which the upper prisms are set deflect downwards some of the rays which otherwise would be expended on the cornices.

The more uniform distribution of light taking place from a far larger surface than the original source does away with sharp shadows and the flaring contrast between the source of high intensity and the objects illuminated by it.

Interesting experiments have been made by several observers, which seem to show that, if the diffused light thrown by opal and ground-glass shades be measured as well as the direct illumination, the loss of light due to them is not as great as used to be supposed, and Stott deduces from his experiments the fact that clear glass globes cut off 6 per cent. of total light, while flash-coated globes are responsible for a loss of 11 per cent., figures which agree very well with those I have put forward; in other words, in order to gain any true idea of illuminating effect, you must take the light emitted over all the working angles, and not on the horizontal plane. PROFESSOR VIVIAN B. LEWES.

(To be continued.)

WELLINGTON'S IMPROVED ROLL OR SPOOL FOR FLEXIBLE FILMS.

MR. WELLINGTON'S description of his invention is as follows:—Fig. 1 is a section of a wooden spool, *a*, upon which, flexible film of paper, celluloid, or other material, has been hitherto wound; these spools have been provided with a longitudinal groove, a^1, within which the end of the film has been clamped by means of a strip of tin, which indented the film into said groove, for the purpose of compelling the spool and film to turn together, a method well known to those skilled in the art.

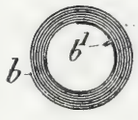
According to my invention, I provide a roll, *b*, such as that shown at fig. 2, of flexible film, which may be utilised in existing photographic apparatus by slipping this roll over the aforesaid wooden spool, *a*, which it is made to fit as represented at fig. 3. At the same time my improved roll is prevented from turning upon the wooden spool, *a*, by means of an inwardly projecting rib or strip, b^1, which corresponds with or fits the before-mentioned longitudinal groove, a^1, in the wooden spool, *a*.

Fig. 1.



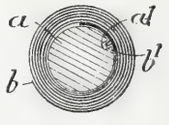
I attain this object by rolling one or more thicknesses of the film itself upon a wooden spool, *a*, or upon a mandrel of like form, so as to form a shell or tube, *b*, which shall fit over the said wooden spool, and I cement these thicknesses together by means of suitable adhesive material, so that they cannot become unrolled during manipulation in the roll-holder or camera.

Fig. 2.



The before-mentioned inwardly projecting rib or strip, b^1, which is to fit in the groove, a^1, of the wooden spool, *a*, I provide by indenting a part of the first fold or coil of the film which forms the shell or roll, *b*, and applying a suitable cement to the outside of said fold or coil extending on each side of said indent; then, by rolling another thickness of the film over such cemented part, the said coils are secured together, and the rib or strip, b^1, is maintained in its correct form.

Fig. 3.



Or I may attach to the end of the film a narrow strip of bent tin, or a strip of wood or other suitable substance which shall fit the before-mentioned groove, a^1.

Rolls of sensitised photographic film, prepared in accordance with my invention, may thus be directly employed in connexion with existing photographic apparatus by being slipped over the empty wooden supply rolls or spools hitherto in use; when thus attached, they will be adapted to be used in conjunction with any of the well-known forms of apparatus intended for the exposure of long strips of sensitised photographic film, inasmuch as they will turn together with the said wooden rolls or spools.

The claim is for a hollow roll or spool upon which flexible photographic film is wound, formed with an internally projecting rib or strip, and of the same material as the photographic film.

THE SPECTRUM TOP.

[Nature.]

As I look around me, and into the sayings and doings of workers in the fundamental principles of light, I do not find that a perfect synthesis of white light has been obtained so as to embrace the law of the combination of pigments. The principle of selective absorption does not appear to me to entirely settle the matter.

It is patent that the crossing of the elementary beams of the solar spectrum—the red, the green, and the violet rays—can be made to coalesce on a screen, and form a patch of light which has more or less a bluish or greenish fringe; but that, when the same colours as pigments, or their nearest approach, are marked out on a disc, and set revolving by means of a multiplying wheel, the effect produced is not pure white, but the grey of a combination similar to that of a disc divided according to the same law in black and white, and set revolving in a similar manner.

Now, the question occurred to me, Was it possible to place a tricoloured painted disc under circumstances that could produce a pure white light?

I first took a disc of white cardboard about two inches in diameter, and divided it into two equal portions by a line passing through the centre of the disc, and painted one-half of the disc black. I then divided a similar disc into four quadrants, and blackened the alternate ones, and another similar disc into eight half-quadrants. On applying the multiplying wheel in all these cases, I produced the same tint of grey as would be produced by mixing in equal proportions black and white pigments. I therefore came to the conclusion that the equal distribution of black and white on the disc, under different arrangements, produced the same effect—the grey. In these experiments I failed to trace the slightest prismatic colour.

On covering other and larger discs with red and blue, red and yellow, and other combinations of what, in Newton's days, were known as primary colours, I found a similar effect, *i.e.*, the red and blue produced violet; the red and yellow, orange; and the blue and yellow, green; *i.e.*, the same tint was produced in each case as would have been produced by mixing the pigments. It was, therefore, clear that rapidity of revolution in layers of equal or unequal intensity produce the same effect as their combination when mixed together as pigments.

How, then, are we to reproduce the resultant beam of white light without a fringe by uniting the several components, taking them optically as

red, green, and violet? I now divided a disc of about four inches diameter into three equal portions, and painted red in one, green in the next, and violet in the remaining one, taking care to get the tints as near as possible to those of the solar spectrum. On rapidly twirling this disc, the same effect was produced. I had the grey that would be formed by the mixture of the three pigments. I was therefore bound to come to the conclusion that experiments, if they can be manipulated so as to produce white in pigments, must be performed with the aid of prisms.

I now took another disc, and divided it into six equal portions by lines passing through the centre, and subdivided one of the sectors also into six equal portions, so as to take two opposite sectors of seven-sixths for the red, two opposite sectors of five-sixths for the green, and two opposite sectors of six-sixths for the violet, making up the six sectors. This is Newton's law, but Newton used what were then considered to be primary colours—red, yellow, and blue.

I now took three instruments, similar to Clerk Maxwell's colour box, and arranged them so as to entirely shut out all the beams but one from either, and made these single beams overlap one another at certain angles on a horizontal screen. I succeeded in obtaining the fringed patch of white light.

I now took the disc painted in the three prismatic colours and placed it in the stead of the screen, allowing each beam to fall on its own separate colour. On applying the multiplying wheel, I succeeded in producing white light of very great purity, and such as I had not obtained before. There was no fringe; the disc revolved in a field of pure white light.

T. L. Alger, LL.D., Ph.D.

PHOTO-MECHANICAL PRINTING: POORE'S "IMPROVEMENTS."

Mr. Graydon Poore describes his process as follows: An ordinary photographic gelatinous dry plate is taken—a bromide of silver plate.

Before exposure this plate is immersed in a bath containing a solution of a chromate salt and then rapidly dried, this rapid drying has the effect of reticulating the gelatine, and so forming a "grain" suitable for a printing surface for use with greasy ink in an ordinary printer's press or machine.

The action of the chromate salt is to form with the silver salt an insoluble double salt of silver. The effect of the action of light upon a plate thus treated in the presence of the chromate salt is to render the gelatine insoluble, so that, when such a plate is exposed to light behind a negative, those parts which have been affected by light are rendered insoluble, and, when the excess of chromate salt has been washed out, the whole surface of the film has been rendered comparatively non-sensitive to light, so that it may be freely exposed without being affected.

Plates thus prepared may be printed from with ordinary printing ink in any suitable press.

Instead of immersing the plates in a bath containing the solution of chromate salt as described above, I may add such salt in suitable proportions to the emulsion of silver salts used in preparing the photographic plates.

The chromate salt I prefer to use is bichromate of ammonium, and the proportions vary according to the effects I wish to produce.

In carrying my invention into effect in one manner I take an ordinary photographic gelatinous dry plate and immerse it in a weak solution of bichromate of ammonium in water. I then dry this plate rapidly by mechanical or any other suitable means. The plate is now ready for exposure under the photographic negative which it is intended to reproduce.

After exposure under such negative for a period of time varying according to the density of the negative, the plate is taken out of the printing frame and washed in water to remove any soluble salts, and the process is complete.

It is advisable before printing to damp the plate, either by saturating it with a solution of glycerine and water or with water only.

The claim is:—

The use in the production of photographic printing surfaces of a sensitised gelatinous plate or film which has been treated, before exposure under a negative, with a solution of chromate salt.

[We may point out that the plan of treating a gelatine dry plate with a bichromate solution for photographic purposes is at least sixteen years old. Was Mr. Poore aware of this?—Ed.]

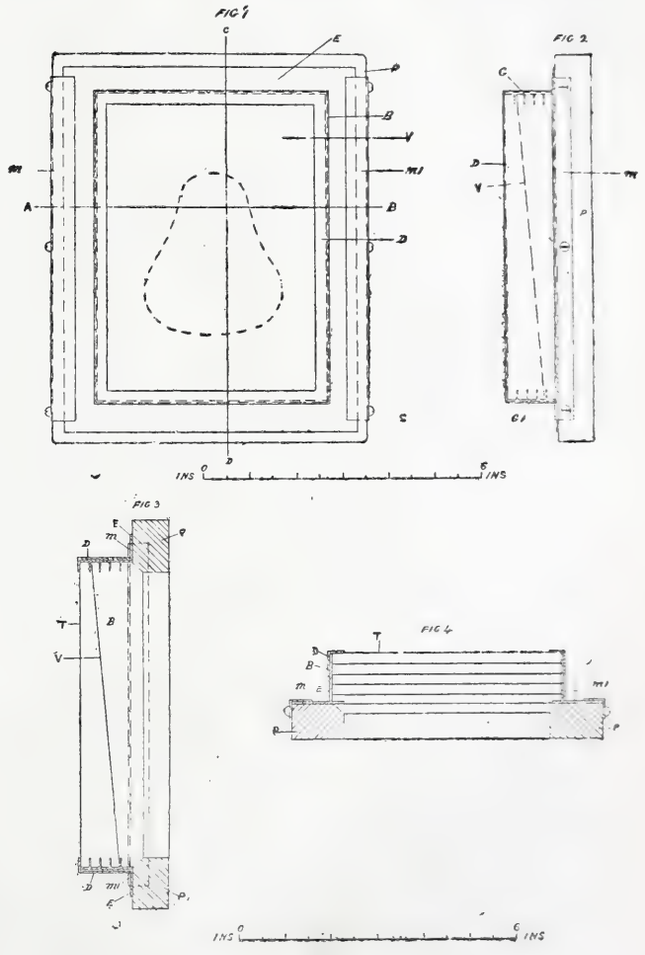
VIGNETTING APPARATUS: SALMON'S IMPROVEMENTS.

Mr. Arthur Salmon says that the object of this invention is to simplify vignetting photographs, and consists of an apparatus in box form, the base of which extends beyond the sides, and is slipped off and on any printing frame by means of two aluminium slides screwed to sides of said frame, allowing of adjustment up and down or sideways, and remaining firmly clipped in any position, and effectually preventing light reaching negative other than by opening in card. At each end of box is a series of grooves by which the vignetting card with opening of desired size and shape can be placed at different distances from negative, and at an angle, thereby increasing or decreasing angle of light passing through vignetting cards, according to requirements of subject on negative from which the desired vignetted print is to be obtained. This vignetting card can be immediately changed for another with different size and shape, opening at will of operator, and not required to be serrated, which enables him to quickly cut a desired shape in another card and replace same.

The lid of apparatus is a light-diffuser, the top being made of translucent medium, can be placed on and off at will, is independent of vignetting card, and not in contact with it, giving the advantage of being able to see negative, determining the size and shape of opening in vignetting card, the distance from, and position over, negative, and is put on after printing out paper has been placed in printing frame with negative, and all subsequent adjustments made, is at a distance from, and does not come in contact with, vignetting card, whereby the light is thoroughly diffused, and produces a soft and graduated vignette print.

In case of dense negative or bad weather, this diffuser can be dispensed with, or brought into use at will without gumming or sticking.

In the accompanying drawings, which represent an apparatus constructed according to my invention, sheet 1, fig. 1 shows a front view of complete apparatus in connexion with printing frame; P is printing frame; B, box for holding vignetting cards; D, the lid of box, which is a light-diffuser;



E, extended base of box; V, vignetting card. Fig. 2 is a side view of fig. 1; G G, grooves at each end of box; D, is translucent medium; V, vignetting card; M, aluminium slide. Sheet 2, fig. 3, section through C D of fig. 1, sheet 1. Fig. 4, section through A B of fig. 1, sheet 1.

The claims are:—1. The means of adjustably securing a vignetting apparatus of boxlike form to a printing frame, the said means consisting of an extended base or flange on the vignetting apparatus, and of slideways on the printing frame, whereby the said apparatus can be readily slipped on and off the said frame, and adjusted endways or sideways as required, while any light is prevented from reaching the negative except through the opening in the vignetting card.

2. In a vignetting apparatus of boxlike form, a series of grooves at the ends or sides to receive the edges of the vignetting cards, whereby the cards can be readily adjusted to the required distance from the negative, and at any angle relatively thereto.

3. In a vignetting apparatus, a translucent or light-diffusing lid, which can be put in place, and removed independently of the vignetting card, with which it does not come in contact.

MELLIN'S PHOTOGRAPHIC COMPETITION.

During this week Mr. Mellin, of infants' food fame, has been holding, at the Queen's Hall, Langham-place, a competition exhibitive of original paintings in oil and water colours, black and white, and photography. A very large number of paintings were displayed in the great hall, the photographs being hung in the outer corridors of the building.

The Photographic Section comprised three classes: F (Open), subjects optional; G (Amateurs), subjects optional; H, Hand-camera Work), open to amateurs and professionals; K, Instantaneous Work, open to amateurs and professionals; L, Lantern Slides. Mr. H. P. Robinson, Mr. F. C. Lambert, and Mr. Alfieri acted as Judges, and, with characteristic generosity, Mr. Mellin placed numerous valuable prizes at their disposal.

The 500 or so photographs hung included perhaps a couple of dozen first-rate examples of modern work; most of the remainder were scarcely up to the standard of merit we are accustomed to find in photographs submitted to public inspection by recognised photographic societies. Nevertheless, although we are obliged to withhold from the display any words of direct praise, Mr. Mellin may be congratulated upon having been the means of affording to many young photographers the opportunity of making a first appearance in public, and of thereby realising to some extent the comparative merit of their photographic productions. Such Exhibitions as this, therefore, are distinctly to be encouraged in the interests of beginners in camera work, who, in the ordinary course, find few public chances of subjecting their work to the educational influences of competitive comparison.

We noted in passing some very admirable photographs to which a word of recognition is due. Mr. Walter Booth, in Class F, had a capital view of *The Choir, Norwich*, and in the same class we came across such excellent bits of work as Edgar Lee's striking Pall Mall exhibit of 1895, *Castlegarth;* Mr. C. M. Wane's Bristol exhibit, *Memories*, to which we referred a few weeks ago, and an admirably-rendered study of an old couple, *The Old Folks at Home*, by Mr. William Howell.

In Class G, open to amateurs only, perhaps the best subject shown was a fine and dignified head study, printed in a red tone, by Mr. Hamilton Revelle, *A Lieutenant of the French Army, Seventeenth Century.* For pose and lighting, for excellence of its effects of ease and truthfulness, this study struck us as an admirable effort. Mr. Hensler's charming little bit of landscape, *A Forest Pool*, and similar work by Edward Atkinson, E. R. Bull, Viscount Maitland, and Edward Crew, distinctly stood out from their surroundings.

In the Hand-camera Class we admired work by H. O. Isaac, and a pictorial gem depicting *Sunset on a Lake*, quite non-impressionistic in treatment, but truthful and effective. Instantaneous work was fairly well illustrated; Mr. R. C. Ryan's study of a man throwing a *Double Somersault;* Edgar Lee's river study, *The Smoky Tyne;* and Mr. J. W. Eadie's very pretty little picture of kittens, *Playmates*, pleasing us exceedingly. Nor must we omit reference to Mr. B. Wyle's clever snap at *Sea Birds;* Mr. B. Highley's study of pedestrians who have obtained *A Good Start;* Mr. F. Reynolds's wave bit, *High Sea at Bognor*, and Mr. Spalding's dog group, *The Essex Union Hounds.* These are some of the good things shown, and which help to leaven the mass of mediocrity of which the Exhibition mainly consisted.

Our Editorial Table.

The American Annual of Photography, 1897.

Edited by Walter E. Woodbury. New York: The Scovill & Adams Co. London Dawbarn & Ward.

The *American Annual of Photography and Photographic Times Almanac* for 1897 comes to us in all the beauty of printing, get up, and illustrations, for which years of experience of the *Times* Annual entitle us to look. There are literally dozens of illustrations in photogravure, half-tone, three-colour, and collotype scattered throughout the book, scarcely a non-illustrated page striking the eye, while the range in the colours of the inks imparts a by no means displeasing variety in this respect. The photographs of C. I. Berg (a charming photogravure frontispiece, *Adoration*—the head and bust of a beautiful girl); Stieglitz; E. E. Barron; J. Wells Champney; Falk; L. C. Bennett; Morrison; Sarony; Alexander Black; Moreno; J. F. Ryder, and many other English and American workers have been reproduced. The articles are terse and practical. Mr. Duchochois' writes on "Photo-ceramics" exhaustively and well; Mr. Wells Champney on "Lighting in Portraiture;" Victor Schumann on "Cyanine;" Maximilian Toch on "Photographing Blood Corpuscles;" Alexander Black of his "Picture Plays;" Joseph Cottier on "The Efficiency of Shutters;" W. H. Walmsley of "Acetylene in Photography and Photo-micrography." These and the remaining articles constitute the *Times* Annual a useful as well as a luxurious book, upon which Mr. Woodbury, the Editor, and the publishers may be warmly congratulated.

The Gloucester Diary and Directors' Calendar for 1897.

Gloucester: The Gloucester Railway Carriage Co.

A neatly bound diary, arranged with spaces, four days to the page, has been sent us by the Gloucester Railway Carriage and Wagon Co. It is a handy book for making entries of engagements, and it appeals particularly to directors, members of council, secretaries, and others having fixed engagements on, for example, the "second" Wednesday, or other days similarly distinguished, in the month, each day being indicated as "the second Monday in May," "the second Tuesday in May," and so forth. This is a happy idea, which might, with advantage, be widely imitated.

Rivot's Sensitised Papers.

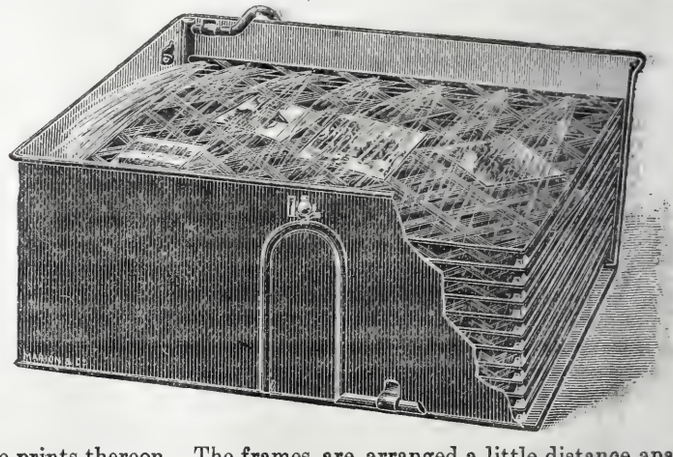
A. Rivot & Co., Willesden Green, N.W.

From Messrs. Rivot & Co. we have received samples of the various photographic printing papers which they prepare. Among these are matt and glossy-surfaced, "self-toning," albumenised papers. These are printed out in the usual way, washed, fixed, and dried. Without recourse to a toning bath, the prints yield agreeable colours; and a black tone is obtained by the use, before fixing, of a special concentrated solution. A quick printing paper, allowing of the toning and strengthening of a very faint image in solutions of either pyro and citric acid, or gallic acid, acetate of lead, and acetic acid, is also one of Messrs. Rivot's specialities. The other is an albumen stripping film paper which gives prints that, when wet, are squeegeed down upon a suitable surface. After being allowed to dry, the print is placed in hot water; this loosens the paper backing, which, when removed, leaves the film behind on the surface of glass, metal, &c., that may have been used. There are points of interest and excellence in Messrs. Rivot's papers that should commend them to many photographers.

Simpson's Print-washer.

Marion & Co., Soho-square, W.

The improved Sectional Print-washer, patented by Mr. Simpson, and manufactured by Messrs. Marion & Co., is composed of a series of frames latticed with linen tape on which the prints (or negative films) are laid and kept from contact with each other. Each frame has at one side a tube pierced with holes, and is connected with the supply pipe; the water rushes through these tubes and through the pierced holes, thus giving a good spray of water for each frame and



the prints thereon. The frames are arranged a little distance apart, and are contained in a tank, japanned inside and out, and also furnished with a syphon.

The outlet will act either as an overflow or as a syphon, in the latter case the little tap at the top must be turned off. By closing the outlet with finger *before* turning the tap, the syphon will start even with a very small flow of water. The system here adopted for washing prints should answer well in practice; it is one that has long been recommended.

The Camera and the Pen.

By T. C. Hepworth, F.C.S. London: Percy Lund, Humphries, & Co., 3, Amen-corner.

This brochure forms No. 11 of Messrs. Lund's Popular Photographic Series, published at sixpence each. Its subject is one with which Mr. Hepworth is, of course, quite at home. He gives the journalist, who so frequently nowadays must be something of a photographer,

any terse but valuable hints on the use of the hand camera, and, sides much useful information on the preparation of sketches r phototypic reproduction, adds some instructive references to the incipal phototypic processes employed for newspaper work. Many modern artist-journalist would find it worth his while to find out, the aid of Mr. Hepworth's counsel, how easily and profitably the mera could be combined with the pen in his work for the press.

Specimens of Picture-frame Mouldings.

W. F. Slater, 169, Southampton-street, Camberwell, S.E.

R. Slater has submitted to us a series of specimens of picture-frame ouldings suitable for the framing of photographs. They are in great riety, and are artistic. Moreover, they are extremely cheap. Mr. later frames the photographs of many of our leading exhibitors, d his taste as well as his workmanship are so good, that we have eat pleasure in recommending his services to those having pictures or otographs requiring to be framed. Accompanying the specimens a welcome New-year's greeting in the shape of a prettily framed py of our Almanac frontispiece, a picture that has been very idely admired, and which gains in effect in the flat green frame ith gold matt that now holds it.

News and Notes.

Royal Photographic Society.—Ordinary Meeting, Tuesday, January 12, eight p.m., at 12, Hanover-square. *Photography by the Röntgen Rays, up Date*, by Dr. Hall-Edwards, L.R.C.P.

Leytonstone Camera Club.—The Council announce that they have ranged for the Second Annual Club Dance, with limelight and prismatic ects, to take place at the Masonic Hall, High-road, Leytonstone, on Saturday, nuary 30, 1897.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday ening next, January 13, Members' Open Night, Slides, &c. The Annual ntern and Musical Entertainment (Ladies' Night) has been fixed for ednesday, January 27.

The Friday evening discourse at the Royal Institution, on January 29, will be livered by Professor Jagadis Chunder Boso, M.A., D.Sc., Professor of the esidency College, Calcutta. The subject will be *The Polarisation of the ectric Ray*. The discourse on January 22 will be by Professor Dewar, on *roperties of Liquid Oxygen*. On March 5, Mr. Shelford Bidwell, M.A., R.S., is to discourse on *Some Curiosities of Vision*.

The Davy-Faraday Research Laboratory.—This Laboratory, which has en founded by Dr. Ludwig Mond, F.R.S., "for the purpose of promoting iginal research in Pure and Physical Chemistry," will be open on January 18. nder the deed of trust, workers in the Laboratory are entitled, free of arge, to gas, electricity, and water, as far as available, and, at the discretion the Directors, to the use of the apparatus belonging to the Laboratory, gether with such materials and chemicals as may be authorised. All persons siring to be admitted as workers must send evidence of scientific training, alification, and previous experience in original research, along with a state- nt of the nature of the investigation they propose to undertake. Further ormation, together with forms of application, can be had from the Assistant cretary, Royal Institution.

Classes in Photography at Birmingham.—A correspondent writes to the *rmingham Daily Post*: "Those of your readers who scan the pages of the *stitute Magazine* may have noticed in the January, 1896, issue an appeal to Midland Institute Council for the formation of a class in photography, ere a thorough theoretical and practical training on the subject might be en. The following is an extract from the Institute Notes column: 'With all the classes there are in this city it might be thought an impossi- ity to find any opening for more, yet we often hear the question asked, Why does not the Institute provide classes in photography?" When it is nembered that every third man one meets now is an amateur photographer, re really seems a fine opportunity for this further addition to the Institute riculum. Now that there are vacant class-rooms to spare, we commend the gestion to the Council for their consideration.' It is now twelve months ce this article appeared, and, as far as I can ascertain, no steps have been en in the matter. May I ask whether any of your readers are aware of the son for this? When we consider the important position our city occupies in photographic world, it is, I think, a matter of surprise that this branch of hnical education has been so long neglected. For example, one can scarcely k into any photographic paper, weekly or monthly, without finding in one other of them contributions or pictures by workers hailing from this district. ight also mention the magnificent work executed by the Survey Section of Birmingham Photographic Society, and the splendid show of photographs he spring Exhibition in New-street. At the present time, if a photographer ateur or professional) is desirous of obtaining a certificate of proficiency in s subject, his only chance is to obtain permission from the Examination partment of the City and Guilds of London Institutes, and undergo a pre- inary practical test in either London or Sheffield. As a citizen of Birming- n, I feel that, with all the facilities we possess in our magnificently equipped ool, this state of affairs should not exist."

Professor Herkomer's New Art.—With reference to Dogberry's recent remarks on this subject, a correspondent sends us the following extract from Messrs. Reeves & Sons' catalogue: "*Professor Herkomer's New Black-and-White Art.*—The materials required for this most beautiful new art are neither numerous nor expensive; it is not, however, at present in our power to offer the particular requisites (Professor Herkomer's patents), as it has been decided by the Painter-engraving Syndicate to retain in their own hands the sale of these. Copper plates, silver-faced, are supplied by the Syndicate on loan, the ink, or colour, is sold in 1*s.* bottles, while the Syndicate reserves to itself the sole right of electrotyping and preparing the artist's work and completing the plates. There is also a small royalty due to the Syndicate by artists making use of the patent method. All information is given by the Manager of the Painter-engraving Syndicate, Bushey, Herts."

Church Lantern Services.—The experience of the Church Army Lantern Department during the past year proves what a great hold is being taken by the magic lantern in Church and mission services. Twice in twelve months has the department outgrown its premises, and further extensions are being arranged for at this moment. Quite recently numbers of lantern outfits have been dispatched to India, Africa, Canada, the United States, South America, France, and Egypt, over and above the very large home work that is carried on daily with all parts of the country. Several thousands of slides are sent out every week on loan all over the kingdom, and the clergy and missioners are unanimous in declaring that great numbers of persons are being reached by the simple Gospel story thrown upon the screen who could not be reached in any other way. "I don't know what I should do without the lantern," writes a well-known clergyman; "I get crowds of men into my church." The whole of the evensong, confession, prayers, versicles, collects, psalms, hymns, &c., thrown on the screen, is everywhere found to be a great attraction, even to the roughest, while the sacred pictures carry conviction to many hearts. Every information in regard to the getting up of lantern services may be obtained, without charge, on application to the Superintendent, Lantern Department, 130, Edgware-road, London, W.

Stockport Photographic Society's Exhibition.—A local paper wrote of this Exhibition: "The Fifth Exhibition of Photographic work in connexion with the Stockport Photographic Society was recently opened in the Stockport Technical School. Few societies can boast of so flourishing a condition as the Stockport Photographic Society, or of so large a body of members. Inaugurated some seven or eight years ago, it now has a membership roll numbering nearly 170 members, all of whom take the deepest interest in the Society. There is hardly a photographer of any note in the town who is not a member of the Society, and consequently some good samples of photographic art are always expected at the Society's annual Exhibition. In recent years these expectations have never been disappointed, and the present Exhibition shows a decided advance on any of its predecessors. Although the number of exhibits are not quite so numerous as last year, there being about 120, a great improvement is to be found in the technique and the selection of subjects. There is, in fact, not a bad picture in the Exhibition, and, even amongst the exhibits sent in by the younger members of the Society, a very high standard of excellence has been attained. The slight falling off in numbers, it might be mentioned, is undoubtedly due to the bad weather that has been experienced throughout the summer. Although some of the pictures have been professionally enlarged, the majority of the exhibitors have carried out this work themselves, and this fact alone shows to what a high standard the 'art' of photography has been brought by the talented group of amateurs composing the Society."

South London Photographic Society's Exhibition.—The organizers of the trade section of this Exhibition, Messrs. G. H. Moss and W. F. Slater, have sent us a copy of the ground plan of the Exhibition hall, showing the arrangements of the bays for the pictures, the platforms, tables for trade exhibits, &c. It is an admirable idea, and will, doubtless, be appreciated by intending exhibitors. The entry form states: *Apparatus.*—Tables will be provided for exhibiting apparatus, &c., in centre of large hall, spaces containing twenty square feet, viz., five feet frontage and four feet deep, at 1*l.* 5*s.* per block, which includes one-third of a page advertisement in the official catalogue free. Spaces at the end of the blocks will be charged 5*s.* each extra. A general stand will be provided for those exhibiting single articles, at a charge of 1*s.* 6*d.* per square foot. *Professional.*—Screens will be provided for trade enlargers, &c., eight feet high by six feet wide, at 25*s.* per screen; per half screen, 15*s.* Each of these charges includes one-third of a page advertisement in the official catalogue free. The Society's medals will be awarded for the best trade exhibit, and also for the most useful novelty in photographic apparatus, on the following conditions:—1. Every exhibitor in the trade section is entitled to compete. 2. No single article shall receive the award for the most useful novelty in photographic apparatus which has previously received a medal. 3. The Judges shall be those acting in the General Section, but they shall, if they so desire, have power to nominate other gentlemen to act with them in judging the trade exhibits. 4. The Judges' decision shall be final.

Photographing Retinal Images.—We take the following from the Paris correspondence of the *Daily Telegraph*: "M. Jules Claretie, Member of the Académie Française and Director of the Théâtre Français, is bringing out in serial form a very interesting, not to say exciting, novel, entitled *L'Œil du Mort*, which is based on some extraordinary experiments made in this country some years ago with a view to the discovery of a murderer by the impression left on the retina of his dying victim's eye. The theory had been started in America, and was ridiculed by most of the French savants, when Dr. Bourion, who was practising in the Department of the Vosges, took it up in 1869. A woman and her child had been murdered in broad daylight, and, although when the worthy physician reached the spot, fifty-six hours had elapsed since the crime was committed, he had their retinas photographed. The result of this experiment was communicated by him to the Society of Legal Medicine, together with a report by Dr. Vernois. No revelation had been made by the mother's eyes, but the photograph taken of the child's, when enlarged, plainly disclosed an uplifted arm, with a dog's head distinctly traced above it. What became of Dr. Bourion after this is not known here, and it is thought that he

may have died suddenly. At any rate, the affair made a great stir at the time, and M. Jules Claretie's story is reviving the interest formerly shown in this experiment, it being argued that, if such a result was obtained by Dr. Bourion with a defective apparatus, and after so long an interval as fifty-six hours, there is nothing to lead to the inference that marvellous surprises may not be in store for any one who may resume it with all the advantages of the latest improvements in photography."

Patent News.

THE following applications for Patents were made between December 21 and December 31, 1896 :—

COLOUR-PHOTOGRAPHY EFFECTS.—No. 29,261. "A New or Improved Process for the Production of Permanently Coloured Effects with Photographs." G. J. SERSHALL.

ARC LAMP.—No. 29,379. "An Electric Arc Lamp for Scientific, Photographic, and Projective Purposes, Kinetoscopes," &c. F. E. BEAUMONT.

MOUNTING FILMS.—No. 29,380. "Improvements in the Mounting of Photographic Films upon Paper or Cardboard Backings." C. BECK.

HAND CAMERA.—No. 29,410. "An Improved Hand Camera." O. VOLKMANN.

NEGATIVE-MAKING.—No. 29,437. "An Improved Process for Making Photographic Negatives." Communicated by O. Moh. E. EDWARDS.

VIEW-FINDERS.—No. 29,456. "Improvements in Photographic View-finders." Communicated by A. C. Mercer. H. H. LAKE.

OPTICAL LANTERNS.—No. 29,666. "Improvements in Optical Lanterns." A. HUGHES.

TIMING RACES.—No. 29,837. "An Improved Electric Photographic Time and Position Recorder, specially useful for Races." Complete specification. J. GAUT.

PRINTING PAPER.—No. 30,161. "The Manufacture of an Improved Photographic Printing Paper or the like." M. JOLLES and L. LILIENFELD.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
11.....	Ealing	*Printing.* A. Ernest Smith.
11.....	Oxford Camera Club	*Results of some Experiments with Gelatino-chloride Lantern Plates (not Printing-out).* H. A. Holliday.
11.....	Richmond	*Plates and Papers.* The President.
12.....	Hackney	*Some Points in the Composition of a Picture.* W. Rawlings.
12.....	Munster	Members' Lantern Slides.
12.....	Rotherham	Prize Slides.
12.....	Royal Photographic Society ...	*Photography by the Röntgen Rays, Up to Date.* Dr. Hall-Edwards, L.R.C.P.
13.....	Bournemouth	*Rambles Around Bournemouth.* C. H. Mate.
13.....	Croydon Camera Club	Twenty-ninth Public Lantern Show.
13.....	Leeds Camera Club.....	Lecture. Dr. Thresh.
13.....	Leytonstone	*Practical Picture Work.* A. Horsley Hinton.
13.....	Photographic Club	Members' Open Night, Slides, &c.
13.....	Southport	*Architectural Photography.* H. W. Bennett, F.R.P.S.
14.....	Darwen	Smoking Concert.
14.....	London and Provincial.....	*Transparent Films.* T. E. Bullen.
14.....	Manchester Photo. Society	*Enlarging.* F. Edwards.
14.....	Oldham	*Intensification and Reduction.* J. Greaves, jun.
14.....	Southport	*Soirée.*
14.....	West Surrey	Rummage Sale.
14.....	Woolwich Photo. Society	*Lens-making, with Practical Demonstration.* J. Desforges.
15.....	Aintree and District	*Norway.* William Lockier.
15.....	Bromley	*The Application of the Röntgen Rays to Surgery.* Dr. Codd and Stanley Hawkings.
15.....	Wolverhampton	Demonstration of the Reproduction and Enlargement of Negatives. H. Holcroft.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 31, 1896,—Mr. E. J. Wall in the chair.

The Chairman showed an enlargement on slow bromide paper, developed with ferrous oxalate, and fixed and washed in company with some other prints. It had been mounted and framed, and in a month turned a dirty pink colour.

The print was passed round, and the change in colour ascribed, without exception, to imperfect fixation.

The CHAIRMAN added that, when it was put in his hands, he had this opinion, and, having tested a portion, found it to be the case.

Mr. H. SNOWDEN WARD gave an account of the decisions of the fire insurance companies in reference to the use of acetylene gas in buildings covered by their policies.

A long discussion took place on the legal aspects of the case and on insurance procedure generally, especially in relation to the power of companies of applying newly defined risks to old contracts still current.

Mr. SNOWDEN WARD, as regards the question of safety, said there had been upon the market samples of carbide which were impure in certain directio with the result that, in contact with water, a gas was given off, which, in t presence of air, burst into flame without any light being applied. With s impure material there would be an element of danger. As far as the restr tions to the use of acetylene were concerned, he said the American and Ital companies, although practically barring it at first, had since removed obstacles very considerably, with the provision, he thought, in the latter ca for a Government approval of the generator. In Spain, where it was proba the most used, there were hardly any restrictions.

The CHAIRMAN thought it a great pity that the future of the gas was handicapped by restrictions. Personally, he had not found any trouble w acetylene, and he did not use the commercial generators, but one of his o contrivance. He was going into the matter at present, but as regards illu nating power taking the oil lamp as 1, he found acetylene from 4½ to 5, a the blow-through jet from 7½ to 8.

Being a Lantern Evening, slides were shown by Mr. Freshwater, includi radiographs of Egyptian mummies, living frogs, and human limbs; and Mr. Welford, of Continental and Convention work. A set of flower studi by Mr. Fraser, of the United States, was also thrown upon the screen a attracted considerable attention.

PHOTOGRAPHIC CLUB.

DECEMBER 30, 1896,—Mr. Thomas Bedding in the chair.

THE RELATIVE EFFECTS UPON PHOTOGRAPHY OF THE USE OF HAND AND STAND CAMERAS.

Mr. R. P. DRAGE hoped to see a disposition to return to the practice using the stand camera. He had an instinctive conviction that the of a hand camera tended towards mere snap-shotting. He thought p tographers made a greater number of exposures than formerly, and an indir result of this seemed to be a falling off in the quality of our lantern slid No increase in the number of slides shown could compensate for this. He not make any attack upon the hand camera as such, but he took exception what he believed to be the result of its indiscriminate use.

Mr. WELFORD entirely dissented. He thought that the slides of the pres day would compare favourably with any. The fact was that users of sta cameras were less enthusiastic than they were. It seemed to him absurd compare the work from the two instruments, which were intended to occu different fields of usefulness Hand-camera men produced a large numbe slides for the delectation of their fellow members, who were not unwilling see slides of fresh subjects from time to time. He had seen most excell work—the results of present-day hand-camera workers—and he would not ad that there was any deterioration.

Mr. BRIDGE remarked that, with few exceptions, the best slides shown at Travellers' Nights, had been done from negatives by stand cameras.

Mr. BEDDING thought that dealing with the question broadly, and ap from their own Club, in which it seemed to be assumed that the art of sli making was lost, the quality of slides was not deteriorating. That was conclusion after seeing the slides in good open competitions.

Mr. FRY said that the term, "lantern-slide competition," was a misnom The first condition was the possession of a suitable negative.

Mr. WILLIAMS suggested that the very fast plates now issued were coars the grain.

Mr. FRY said under-exposure was more often the cause of granularity.

Mr. BRIDGE added that some workers always gave a fractional exposure, e to a good still subject like a stone wall.

Mr. MACKIE said that, as a body, professional photographers always] ferred to err on the side of over-exposure.

Mr. NEWMAN thought that some failures might arise from the popu fallacy that all that was necessary with a hand camera was to press a butt

Mr. FRY said that many of the workers who produced such excellent sli six or eight years ago made their slides by reduction from larger negativ This would undoubtedly give an advantage as compared wtih reproduct from a quarter-plate. He suggested that the Secretary should endeavour obtain the loan of some slides made by Club members about the pe referred to, viz., six or eight years since. If Mr. Welford would do the s thing among the best present-day workers, the members would be able t the slides upon the lantern screen and form their own opinions.

This notion was accepted by the meeting, and it was decided that the set should be limited to slides made before 1890, and the other set to sli made afterwards, and that no limitation should be placed upon the process which the slide was made.

Croydon Camera Club.—Between fifty and sixty members assembled the newly-acquired club-rooms, situate at 106 George-street, on Wednes the 30th ult., when formal possession was taken, and was celebrated by sev interesting attractions which had been arranged mainly by the indefatig exertions of the courteous Hon. Secretary (Mr. H. E. Holland), whose serv were during the evening warmly acknowledged by the President. *Impr* was a bright and commendable display of framed photographs, which been specially arranged upon the walls by Messrs. Packham and Rogers. is impossible to particularise the many noteworthy subjects. but Mr. Macl (*Ninham*), Mr. J. Smith (*Skittles at Fittleworth*), Mr. J. Noaks (Port Reproductions), Mr. J. Packham (Pastel Photographs), Mr. Woodcock (largements), Mr. G. W. Jenkins, Mr. J. T. Sandell, Mr. A. Underl and a number of choice examples of Mr. H. E. Holland's refined pri amongst which specially noticeable being a well-executed cottage scen Limpsfield, with a picturesquely posed rustic water-carrier, may be m tioned as among many other members who contributed sterling w The above were supplemented by a small loan collection of studies Messrs. Worsley Benison, C. Job, Ralph Robinson, Gambier Bolton, Wilkinson, and others who have gained a distinguished position in the ph graphic world. In opening the proceedings, the PRESIDENT of the Club (Hector Maclean, F.R.P.S.), having paid a tribute to the invaluable help g

by Councillor Noaks in directing and watching the fitting and decorating of the handsome and commodious suite of rooms, the largest of the three being sufficiently spacious to seat 100 persons, stated that the Club did not wish to keep so convenient a meeting-place all to itself, but would be pleased to grant the occasional use of either room to any approved society or association needing such a meeting place. Next, Sir FREDERICK EDRIDGE delivered a well-applauded address. He congratulated Councillor Noaks upon the success of his labours in supervising the finishing off of the rooms. As regards the President's remark that "he felt he might that night rest and be thankful," the speaker thought that Mr. Maclean should rather "rest and be thanked," in that he had for eight long years done his best to establish a wholesome interest in photography amongst our townsfolk. Sir Frederick cited some calculations made, from which it appeared that, during the Club's eight years, over 200 meetings to consider special subjects of a photographic nature have been held; also nearly thirty public lantern shows, which have been attended by a total of about 8000 people, and at which have been displayed some 6000 lantern slides (representing the pick of about 60,000 slides). Two public exhibitions of photography have also been held, and many excursions with a camera to various places of historic, artistic, scientific, or picturesque interest held; for which, and other reasons he, the speaker, proposed that the thanks of the members should be given to the officers of the Club, with which he coupled the name of the President, whose, he might say, world-wide notoriety as regards photographic matters was known to them all. The above, having been seconded in an apposite speech by Mr. RICHARDSON, was carried by acclamation, as also the thanks of the Club, proposed by the President, and ably seconded by Mr. James Packham to Sir Frederick Edridge for his kindness in favouring the meeting with his acceptable presence and stimulating remarks. Following the talk came a short lantern show, especially interesting being a series showing the wrecked Brighton piers, &c., by Mr. Taylor, who also contributed some well-taken pictures of the motor-car proceedings on the memorable opening day. Mr. Maclean showed a nice little set of frost and snow studies. Messrs. Underhill, H. E. Holland (a fine series of Devonshire), A. E. Isaac, Corden, Carley, and A. J. Noaks were also well represented by their slides. Next, Mr. J. Smith undertook to photograph, by means of the magnesium flash, the assembled company, arranged as a dense group at one end of the large room. Using a newly devised lamp, specially constructed by himself, two exposures were made, in each case six cameras being brought into play. The results will be shown next week. The following gentlemen were duly elected members:—Messrs. E. C. Roffey, T. Carley, G. Robinson, W. Friese-Greene, and J. Miller.

Hackney Photographic Society.—December 23, 1896, Mr. W. Rawlings presiding.—Samples of Messrs. B. J. Edwards's lantern-plates and developers were distributed for trial. In a lantern lecture on

VENICE AND LUCERNE,

Mr. W. FENTON-JONES gave an account of a holiday tour in Northern Italy and Switzerland.

Leeds Camera Club.—December 30, 1896.—Annual Public Exhibition of Members' Lantern Slides and Enlargements. Amongst the contributors of slides may be mentioned Messrs. Barnes (who showed some beautiful examples of Yorkshire scenery), Irwin (whose carefully studied compositions are becoming so well known), Morfit (excellent snap-shots from Switzerland, East Coast, and Isle of Man), Vevers (whose statuette studies and seaside scraps were amusing, if not beautiful), Paley, Brown, Garbutt, Gaunt, Emmott, Sharp, and several others. The biunial lantern was most satisfactorily manipulated by Messrs. Bourke and Oddy. The evening's entertainment was varied at intervals on the piano by Messrs. Coates and Wigglesworth; delightful mandolin solos by Madame Ami Sharp, G.C.; exhibition dancing by Signorita Deatoni and Signor Urwino; vocalisation by Bro. Sam Swinden (humourist), and C. Palliser (who turned on the pathos), and a clever phonographic display by Dr. Bourke, whose delightful mixture of hymns and comic songs was loudly applauded.

FORTHCOMING EXHIBITIONS.

1897.

January ..... Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

,, 14, 15 ..... Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

February 1–27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

,, 25–27 ..... Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.

March 6–13 ..... South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PITS IN GELATINE PLATES.

To the EDITORS.

GENTLEMEN,—In Mr. A. L. Henderson's letter in regard to "Pits in Gelatine Plates," I see at least another person besides myself finds that defects in dry plates may be attributed to the manufacturer, and, if it happens to be the same well-known maker, it seems that my calling his attention to the defect has not been fruitful. My trouble was transparent spots of irregular sizes and forms, sometimes a few at different parts of the plate, and, at other times, a hundred or more close together in a line, near one or two edges. The answer to my complaints were air bubbles, but no admission that it could be the manufacturer's fault. I was told at one time by some one that it may be a sprinkling of water on the edge of the plate during the setting of the film. Be this as it may, I never could detect the defect before the negative was finished and dried. I could not see any defect before developing nor after, neither after fixing and washing, but after drying.

Some time ago I read in your valuable JOURNAL some experiences in that direction ascribed to some poor quality of gelatine which was decomposing during a more or less prolonged drying of the film. I should rather think this to be the real reason of some pits. In such a case, is not the manufacturer to blame, and to be held responsible? I do not mean that he could or should be prosecuted legally, but what else can be done but to be discouraged in patronising him further, and to go to another one?—I am, yours, &c.,

A. LÉVY.

Asnières, Seine, January 3, 1897.

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—A few remarks from an independent member of the Royal Photographic Society, who has not identified himself with either of the parties in the Society, on the subject of the recent letters of Captain Abney and Mr. Chapman Jones, may prove of interest.

Both these letters seem to me to be appeals from the judgment of the London members, who know, to that of the country members, who do not know, the working of the Society.

I have always been under the impression that the duty of a President of a Society was to preserve due order and decorum at the meetings of the Society and its Council, and that the duty of the Honorary Secretary consisted in carrying out the wishes of the Council; instead of which, we have here a President and a Secretary who have endeavoured to paralyse the Council by threats of a strike unless they were allowed to over-ride its decisions.

Captain Abney, in his letter, says that one of the recommendations of the Council was "that the articles (of association) should be so altered as to exclude the five senior members from re-election." This is a misstatement, as I understand the Council wished every year to have five new members elected, so as to infuse "new blood" and enthusiasm into its proceedings. Reasonably enough it was suggested that the five senior members should retire, *if necessary*. As a matter of fact, at least two vacancies have occurred naturally every year, so that only the three senior members would have to retire. In any case, they need only remain in dignified ease for twelve months, when they would be again eligible for election. In other societies to which I have the honour of paying a subscription, the senior members retire in rotation, as a matter of course, and think it no hardship. Looking at this fact, the nonsense in Captain Abney's letter, about the disqualified member being "in the same position as a felon or a bankrupt," &c., is a very poor compliment to the intelligence of the country members.

Captain Abney and Mr. Chapman Jones both say that they have no objection to the inclusion of new blood in the Council every year. If they don't object, why do they object?

As regards the "perpetual tinkering at rules," of which a strong point is made, I believe that the reasonable reform now before the Society was proposed as long ago as 1886, and that it is due to the opposition of a small but determined party that it has not sooner been carried into effect. Further, I believe that no change in the rules has been made since 1886, except the changes legally necessitated by the Incorporation of the Society. This is the first occasion when the reform has been proposed by a majority of the Council itself, and Captain Abney and Mr. Carpman Jones take this opportunity of resigning and writing threats about the coming election.

Apart from the letters of Captain Abney and Mr. Chapman Jones, I should much like to call attention to one matter urgently in need of reform, viz, the nomination system as at present carried out. The plan of publishing the names of nominators in the voting list seems to me a particularly objectionable way of influencing the votes of the rank and file of the Society, and I am surprised that the Council has not pressed this reform forward. The net result of this system is that the ordinary members are induced to vote for candidates, not because they are good men or have done good work, but because they have a long string of big names as nominators.—I am, yours, &c.,

C. F. TOWNSEND, F.C.S., F.R.P.S.

31, *Elms-road, Clapham Common, S.W, January* 3, 1897.

To the EDITORS.

GENTLEMEN,—As a member of the Society, I have read with interest the letter from Captain Abney which appeared in your columns, and a letter from Mr. T. Bolas which appeared in the columns of one of your contemporaries.

I gather from these two letters that the Council have passed a resolution to alter the rules. Captain Abney says the alteration recommended

was "to exclude the five senior members of Council from re-election." Mr. Bolas seems to be most careful in guarding himself from confirming Captain Abney's words, and speaks of them as "the nature of the resolution," the "real sense," and "the point and essence of the matter." The rest of his letter is devoted to a denunciation of agitators (he is to be congratulated on assuming an entirely new *rôle*), and a defence of Captain Abney's veracity against some unknown traducer.

Surely the best and simplest way to have defended Captain Abney's veracity—if it needed it, it being unchallenged, except by the unknown traducer—would have been to quote the actual resolution passed by the Council; and, as Captain Abney has published his account of its proceedings, there could be no objection to Mr. Bolas taking a similar course. What we want to know is, not Captain Abney's and Mr. Bolas's deductions from the facts, but the actual facts, so that we may judge them for ourselves.

At the meeting of December, 1895, convened to alter the rules to the effect that five members of each new Council should not have served the previous year, and providing that, in case there should not be a sufficient number of vacancies, they should be made by the retirement for one year of the senior members, the resolution was passed practically unanimously (in a large meeting there were only two dissentient votes), but it could not be embodied in the laws on account of some trifling legal informality. The then President, Sir Henry Trueman Wood, however, promised to report the sense of the meeting to the Council, and to bring the matter before them for consideration. It appears that the Council have considered the matter. According to Captain Abney's statement, they have passed a resolution quite contrary to the spirit of the resolution passed by the meeting referred to. According to Mr. Bolas, Captain Abney's statement is the "nature," the "point," the "essence," the "real sense," of the resolution passed by the Council. Now let us have the naked truth.—I am, yours, &c., HENRY R. HUME.

HAND-CAMERA POSTAL PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—Will you kindly allow me a little space to announce to your readers that I am about to form a Postal Photographic Club, exclusively for hand-camera workers, and that I shall be pleased to receive the names of any ladies or gentlemen wishing to join. I may state, perhaps, at the outset, that only good workers will be accepted.

Application for membership should be accompanied by two specimen prints.

Thanking you in anticipation of your kindness,—I am, yours, &c.,
Brow Hill House, Leek. G. V. MYATT.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

RECEIVED.—S. S.; VICTOR SELB; R. B.; J. C. SHERSTONE; AND OTHERS.

"PLATINO-BROMIDE."—M. P. There is no platinum in the paper—it is a trade term.

ALLEGED DEFECTIVE LENS.—C. F. Send us the lens, and we will endeavour to answer your question.

"NO. 1."—Sorry we cannot help you. An advertisement would, no doubt, bring you what you want.

O. C. VANSTON.—Your question was answered on December 18. See notice at the head of this column.

E. S. (Forres)—The scratch at the side will, in all probability, not interfere with the definition of the negative.

T. T. WING.—Against our rules, and we do not keep such names and addresses after the questions have been answered.

SUBURBAN.—You have omitted your name and address; hence, in accordance with our rules, your query remains unanswered.

L. F. T.; C. B. and others. We do not here give the addresses of our contributors. Forward us a stamped addressed letter, and we will post it on.

WALTER.—Send us your name and address, and we will deal with your letter. Every week there appears a notice in these pages that questions are not answered unless the names and addresses of the writers are given.

FLANGE.—We believe that Messrs. Watson, Holborn, and Perken, Son, & Rayment, Hatton-garden, sell a form of universal adapter, which would probably answer your purpose. Write to those firms, stating your requirements.

LENS.—T. ROGERS. In such a matter as the prices charged by different firms for a particular kind of lens it is not our place to interfere. We should be pleased to see the instrument, if you will leave it at this office any Thursday or Friday morning.

THE PROPOSED TECHNICAL EXHIBITION.—F. F. T. W. Better address your suggestion to the Assistant Secretary of the Society, 12, Hanover-square. It is impossible for us to say at present upon what lines the proposed Exhibition is to be run.

REMOVING SILVER STAINS FROM NEGATIVES.—SENBAB says: "My printer wishes me to ask you, Do you know of any plan by which he can get silver stains out of his dry-plate negatives?"—Try King's Solution, sold by Marion & Co., Soho-square, W.

KEEPING STARCH PASTE.—H. ATKINS. The addition of antiseptics, such as carbolic acid, oil of cloves &c., will prevent the putrefaction of starch paste, but they are not to be recommended, as it is so readily made as required, and is better, in every way, when used fresh.

ORTHOCHROMATICS.—R. HARVEY. Yes; we are open to conviction. Probably the subject will shortly come on before one of the London societies; in the mean while, if yellow screens produce colour correct renderings with ordinary plates, why use orthochromatic plates?

BRASS FITTINGS, &C.—S. A. NICHOLS asks: "1. Can you tell me where I can get mother-of-pearl? 2. Also ornamental brasswork suitable for plush frames," &c.?—1. We regret we are unable to answer this query. 2. Messrs. Marion will supply the brass fittings. If they do not stock them, they will procure them to order.

STEREOSCOPIC LENSES.—C. B. Exactly: it is always recommended, and quite properly too, that the lenses should be accurately paired; nevertheless, a slight difference in the foci is not fatal to the obtainment of *passable* results in the stereoscope. But this latter statement surely does not lay us open to the charge of recommending lenses of dissimilar foci for stereoscopic work.

ENAMELLING COLLODION.—R. FOWLER. The semi-solid mass in the bottle, resulting from the stopper being left out, may be redissolved by the addition of fresh ether and alcohol; but they must be very strong, otherwise there will be the danger of a crapy or opalescent film, because, although the solvents have evaporated, they have left the water they contained behind. Unless there is much to be dealt with, we should say, Throw it away.

SALE OF NEGATIVES.—W. H. H. asks if it is illegal to sell the negatives that are taken of sitters. He says: "I have many thousands of negatives that will never be ordered from, and I have an offer for a few thousand of them. They will, I believe, be used, many of them, for advertising purposes. Is there any reason why I should not accept the offer?"—Yes. It has been decided that, although negatives taken in the ordinary course of business are the property of the photographer, he has no right to use them except to the order of the sitter. If you have all the sitters' consent, you may do what you like with them.

LENSES, PAPER, CANVAS.—EDMOND WALLIS says: "I shall be very glad if you can favour me by answering the following:—1. Can you tell me how to obtain the address of a lens-maker suitable for cheap cameras? 2. Where can I obtain a paper for backgrounds six feet wide? 3. Also where to buy wholesale a strong canvas similar to that used by scene-painters? I want it for large backgrounds."—In reply: 1. You cannot do better than refer to the advertisement pages of the ALMANAC. 2. At any of the large upholsterers, under the name of carpet paper. 3. Suitable canvas, under the title of unbleached sheeting, can also be had from upholsterers and furnishing warehouses.

REPAIRING TRAYS.—W. A. EDWARDS writes: "Would you please inform me how to make marine glue, and the way it is applied? I have some glass-bottom trays, the seams of which I have pitched when they have become leaky, but I find this objectionable, as the slightest strain or knock on the woodwork is likely to cause a crack in the patch, and consequently a leak. Or is there any kind of hard wax that would be as easily applied as pitch, yet not so brittle?"—Marine glue is composed of india-rubber, coal tar, naphtha, shellac, &c. There are different formulæ for it. It is difficult, not to say dangerous, to make successfully without proper appliances. We should advise our correspondent to purchase the small quantity he is likely to require. To use it, melt it in an iron pot, and apply with a brush. We know of no better material than marine glue for the purpose required.

COPYRIGHT.—M. H. J. says: "As there is so much said about the copyright of a picture just now, and not wishing to do anything against anybody's right, I should be pleased if you would put me right on the following matter. Prior to 1886, an old cross stood in the centre of Grantham Market-place, but in that year it was pulled down because it was not considered safe, and a monument put up in its place. As the cross was an old historic landmark in Grantham, any photograph of it is valued very much. About six years ago, a photo came into my possession, and, as it is getting very yellow, I should like to copy it, and also sell copies of it, but am not sure whether I should be doing right in doing so. As the cross was pulled down in 1886, the photo is at least ten years old, and, as the photographer who took it has not been heard or seen since for some years, and I have not heard of anybody having a negative of it, and have not seen any photo of it, but the one which I have, shall I be doing right in copying it and selling it, and also making lantern slides of it, and enlargements, or dealing with it in any way?"—In reply: No; you would be running the risk of an action for infringement. Morally, you have no right to copy and reproduce the photograph; legally, you may have if it is not registered at Stationers' Hall.

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No. 1915. Vol. XLIV.—JANUARY 15, 1897.

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EX CATHEDRÂ.

On July 10 of last year we drew attention to the circular of a proposed Institute of Photographic Artists. The offices were given as 61 and 62, Chancery-lane. Such names as Luwee Harris, F.I.A.S. (President), E. C. Toller (Vice-President), Henry Snowball, H. H. Robinson, and others quite as unknown to us, appeared in the prospectus. The Institute invited photographers to become fellows or associates. Entrance fees and subscriptions ranging from 2*l.* 2*s.* to 10*s.* 6*d.* were to be charged, in return for which the use of certain initials and sundry privileges and advantages, the like of which are obtainable from existing photographic societies, were offered.

* * *

For the information of any of our readers who might be inclined to join the Institute, we pointed out, last July, that the names of the gentlemen organizing the proposed Institute were quite unknown to us, and that the ground which that body intended to occupy was already taken by existing photographic societies. What we then said holds good now. The "Institute"—judging by some documents that are before us, which include a certificate of membership, "given under the common seal of the Institute"—is in active operation; yet still, in what we may term the photographic world, its existence is probably unknown. Why is this, Messrs. Luwee Harris and you other gentlemen dating from 61 and 62, Chancery-lane, W.C.?

* * *

Concerning the Institute, Mr. J. G. Pratt, photographer, of Greenock, writes: "About last July we received the enclosed circular, and we signed our name to the form enclosed along with it, more for fun than anything else. We noticed in one of your leaders, about that date, reference was made to this Institute of Photographic Artists. This morning, although we have had no communication since, we received the other paper, which we also enclose. Will you kindly answer in next week's issue, whether this affair is genuine, or we should be happy to have your advice as to what we ought to do. It is difficult for country photographers to know how to act in these matters."

* * *

One of the letters from Mr. Luwee Harris to Mr. Pratt says that the response to the issue of the preliminary prospectus six months ago was so satisfactory, and "there was such a general and encouraging desire for the formation of the Institute," that it was decided to proceed with the incorporation. Mr. Pratt is also asked if he would like to occupy a seat on the Council. Some Councils appear delightfully easy to get on, we remark. Another of Mr. Harris's communications encloses Mr. Pratt a certificate of membership; a postcard for its acknowledgment, and a request for the payment of 2*l.* 2*s.* entrance fee and subscription. By the way, Mr. Harris *signs* himself Secretary; on the prospectus he figured as President.

* * *

Mr. Pratt asks for our advice. We know absolutely nothing of the Institute or its promoters. Without offering Mr. Pratt, and others of our readers who may stand in need of it, any definite advice, it is possible that, if they avail themselves of our example in the matter, they may not do wrong. We belong to the Royal Photographic Society, the Convention, and other societies formed for theadvancement of photography; but, after reading the prospectus and other literature of the Institute of Photographic Artists,

of 61 and 62, Chancery-lane, we shall not at present make application for membership.

* * *

The Photochrom Company, of 61 and 63, Ludgate-hill, E.C., inform us that they have taken over the business, premises, machinery, plant, technical apparatus, and negatives of Mr. Carl Norman, of Graphic Works, Tunbridge Wells, who remains with the Company. At an early date the Company intend erecting a large factory for the purpose of producing their work here instead of abroad. Besides photo-chromatic printing, three-colour printing blocks, photographic engraving (half-tone and line), silver printing, enlargements, platinotype, and collotype will be undertaken under the able guidance of Mr. E. Llewellin White, the managing Director. We anticipate fresh successes for the Company in the new fields it has chosen.

* * *

It is stated that M. Gaston Tissandier, who for the last quarter of a century has presided over the destinies of *La Nature*, has just retired from the editorship, and M. Henri de Parville has succeeded him. It is not proposed to make any changes in the character of the journal, and the traditions which have secured for *La Nature* a high degree of success and prosperity will be followed by the new editor. Our contemporary is, perhaps, the principal French journal devoted to science, and has always given prominence to photographic subjects, with which, as many of our older readers will remember, the able pen of M. Gaston Tissandier occasionally dealt.

A RETROSPECT AND A QUERY.

At the commencement of a new year it is very customary to give a review of the advance that has been made in the past one. At times, however, it is advisable to look further back than a year, or even a decade or two, and see what real advance has been made in the interval. This becomes the more necessary, when, as in the case of photography, the lay public, as well as the majority of the present generation of photographers, too frequently claim that the results obtainable now are almost, if not entirely, due to modern inventions, and to them only. It is the more necessary to do this, inasmuch as many modern writers and lecturers fall into the same error, and not infrequently mislead others in the matter.

Let us look back, for instance, thirty or more years, say prior to 1866, and see the state of the art and appliances then, and we shall find, notwithstanding the limitations, that little is accomplished now beyond what was done, and well done, then. In doing this it will naturally occur to one whether the results now obtained are so commensurably superior with the increased facilities for obtaining them.

At that very early period there was, and had been for years, ceramic photography. The burnt-in enamels of Lafon de Carmarsac and of Joubert, as the many examples of them about prove, are not surpassed by any of the more modern productions. There were roller slides then, and, with them, excellent negatives on paper were made, many of which, up to 12×10, are still in existence to prove their quality. Spools were also designed to be changed in daylight by having the end of the negative paper supplemented by a length of black calico to protect it from light. Black paper is now used for the purpose.

Carbon printing without transfer was in use, the process being the bichromated gum method, recently reintroduced, and by which several of the carbon prints that have been shown at the Salon and elsewhere were produced. Instantaneous photographs are thought by many to be only a modern possibility. Instantaneous Daguerreotypes, however, were taken of similar subjects to those now taken with gelatine. Instantaneous pictures by the wet-collodion process were common enough, as witness the street scenes of Paris and London, by the late Mr. W. England and by Mr. Blanchard, the sharpness of the moving objects not being surpassed by any of the modern work. Photographs of the denizens of the "Zoo," taken by Mr. Frank Haes, in the fifties, with wet collodion, have not yet been beaten. In reference to rapid exposures, so far back as 1851, Fox Talbot secured a perfectly sharp photograph of printed matter, fixed on a rapidly revolving wheel, by the light from the discharge of a Leyden battery, the duration of which is far less than the two-thousandth part of a second.

We have now panoramic cameras in which a film is bent to a curve and the lens rotates. In the very early fifties there was a similar camera, in which a Daguerreotype plate was bent to a curve and the lens rotated on a flexible front. We have seen some very good Daguerreotypes that were taken with it at that time.

Photogravure was in existence in the very early fifties, by which Fox Talbot and others did excellent work. The process was biting the copper plate in with perchloride of iron through an exposed bichromated gelatine film. Process-block making, and another photogravure method, both Pretsch's, were practised. Photo-lithography, both line and half-tone, were in evidence, and what was done with each it would be difficult to beat now.

At that early date there was no Jena glass, yet negatives, even of very large size, free from distortion and perfectly sharp alike at the margins and the centre, were regularly produced, as witness, for example, the Ordnance maps. There was no retouching then, yet results were obtained then that are not surpassed now; but, of course, they required greater skill on the part of the operator to obtain them than is the case with gelatine plates and retouching. There was no ready-sensitised paper then, and the worker, whether professional or amateur, had perforce to prepare his own—in the earliest days even to albumenising it—and the results he obtained were, if not superior, certainly not inferior to those on modern papers either as regards excellence or stability, whether they had a matt or a glossy surface. Collodio-chloride was in use, and the prints obtained were as good as the best that are produced now, and they have served to establish that this is perhaps the most permanent of all the silver processes.

There were some amateurs in those days, but they were not mere "button-pressers." They had of necessity to prepare, in the case of paper negatives the paper, and of dry collodion the plates. In the case of wet collodion, which many amateurs worked in the field and carried the necessary outfit for the work, the plates had, of course, to be prepared, developed, fixed, and washed on the spot. Amateurs did all that, and produced such work as would put many amateurs of the present day, working gelatine plates, to shame.

Inventions were made in those times, but they were princi-

pally made, not by manufacturers and dealers, who patented them, but by amateurs, who gave them freely to the public.

With all these facts, and others, before us, and seeing what was done—and done well, too—at the early periods referred to, one is, not unnaturally, inclined to speculate as to whether the advancement of photography, as regards results, during the past thirty years, has been commensurate with the increased facilities afforded during the time for obtaining them.

Photographs by Wire.—It is stated that Dr. R. G. Auger, of Chicago, has devised a method by means of which photographs, &c., can be transmitted long distances, and printed at the receiving end of the wire by means of Röntgen rays. It is further stated that, although the apparatus is only in the embryonic stage, exact reproductions have been already produced through a wire of great length. We have, so far, not seen any of these marvellous results, nor have we met any one who has.

Geological Photographs.—As we have before stated, the production of photographs of geological interest is looked upon as a matter of great importance by the geologists, and the collection of some 1400 pictures now lodged in the Jermyn-street Museum is placed in company with the Survey Collection of prints taken and acquired by the officers of the Geological Survey, the two sets supplementing one another. Our purpose in again calling attention to the matter is to point out that members of photographic societies are earnestly looked to to help in the work. The following list of counties contains the names of those sparsely or not at all represented in the collection: Bedford, Bucks, Berks, Cambridge, Cumberland, Essex, Gloucester, Hants, Hereford, Herts, Huntingdon, Lincoln, Middlesex, Monmouth, Norfolk, Northants, Nottingham, Oxford, Rutland, Stafford, Surrey, Sussex, Warwick, Westmoreland, Worcester, Wiltshire, South and Central Wales, Scotland except parts of the Highlands and the Central Valley, S.E., S.W., W., and Central Ireland.

Acetylene in the United States.—According to Mr. P. C. Frewin, the permission by insurance companies to allow the use of acetylene by their policy-holders will be general. There is no doubt that some experiments that he carried out before the Chemical Society of New York show it to be a far less dangerous substance than is generally believed. One of his experiments, presumably not conducted before the Society named, was to fill an iron ball at a pressure of 5 pounds (?) per square inch, and then to subject it to violent blows with a sledge hammer till the ball was quite bent out of shape; the result was *nil*, no explosion whatever. Possibly the "5" pounds pressure is a misprint for 50 pounds, as to put the gas in at about one-third of the ordinary atmospheric pressure would be rather a difficult matter, and if it were done it is hardly to be expected that an explosion would follow, for the capacity of the ball might be reduced to one-third without danger. Mr. Frewin states that there are seven hundred and thirty people in New York alone using acetylene as a general illuminant, yet only three accidents have happened, two through escapes of the gas and the third through the use of a lighted candle close to the generator.

The Manufacture of Calcium Carbide.—Though, so far, very little has been done in this country with acetylene gas, the manufacture is being rapidly pushed in the United States, and a series of papers on the subject, written by Messrs. Morehead and G. de Chalmot, is being published in the *Chemical News*, and, as it is the work of practical men engaged in the manufacture, special interest attaches to it. The works of the Willson Aluminium Company have been working since May 1, 1895, and the gentlemen named give full details of cost, &c. They say that they consider the cost excessive, yet they are able to produce the carbide at under twenty-five dollars per ton including wear and tear and interest on capital. With regard to purity of the salt, they have varied their process, and found that, though the pure carbide will produce more than 5·9 cubic feet per pound, it has been found more economical to produce carbide that only gives off gas at the rate of 5 feet to the pound. There is one point alluded to which may have an important effect in the production of the gas on a small scale. Messrs. Morehead and Chalmot say that the pieces of carbide are not uniform in composition at all times, the upper part of a piece often being purer than the under part. An immense amount of practical information is given in those articles, showing that a large export has already taken place, and that in the future this is likely to be exceeded, and at a reduction in the prime cost of manufacture.

SILVER INTENSIFICATION OF COLLODION EMULSION NEGATIVES.

II.

It must not be supposed that an emulsion that gives the strongest image with alkaline pyro will necessarily take on density most readily with silver, for such is far from being the case, as it will usually be found that, in cases where the first image comes up boldly, and of a black colour, like a gelatine negative, it is very little amenable to further intensification; but, when, with a very small quantity of alkali, it appears, in the light of the developing room, a very faint pinky-brown tint, and, on slightly increasing the alkali quickly, shows a tendency to intensify, then we have an image that we may fairly expect to take silver intensification satisfactorily; and, when this state of affairs occurs, there is nothing to be gained by carrying the alkaline development beyond the point of getting out a visible image in all its details, however faint. In fact, for the sake of clearness of the line, it is preferable to stop at as early a stage as possible.

As regards the formula for silver intensification, although many fanciful variations have been made from the old-fashioned combination of pyro, acid, and silver, I have never succeeded in finding any advantage in any of the innovations over a plain solution of pyro and an acidified solution of nitrate of silver, or, as some prefer to use it, an acidified pyro solution with a plain silver solution subsequently added. So far as this variation is concerned, it is perhaps merely a matter of choice. The acidified pyro solution has this advantage, that, when flowed over the plate before the addition of the silver, it effectually neutralises any alkali that may have been left in the film through careless washing, and thus acts as a safeguard against fog from that cause. At the same time, the intensification, under normal circumstances—that is to say, when it is not necessary to push it to any great extent—may be more rapidly performed, since a minimum of restraining acid can be used. But, under these conditions, the solution very quickly becomes muddy, and necessitates renewing, in order to get full density, or else offers the risk of dirty shadows and stained film. On the whole, therefore, I rather prefer to have the acid combined with the silver, and, if the two be properly proportioned, there will be no unnecessary time wasted in the operation, and each successive addition of silver will carry with it a due quantity of acid, and thus keep the solution clear for an almost unlimited period.

The next question of importance is the choice of restraining acid. In the old wet-plate days acetic acid was generally used simply as a matter of convenience, in fact a fresh quantity of the ordinary developer was frequently taken, and, with the addition of a few drops of silver from the bath, applied as an intensifier. This answers sufficiently well when only a slight degree of intensification is necessary, or when, as in the case of a wet plate, the film is one that readily takes density; but, for protracted intensification, or with emulsion films that are slow in responding to the action of acid silver, acetic acid will not keep the solution clear for a sufficiently lengthened period. The colour of image it gives, however—a rich brown—is to be preferred to the black or blue-black that citric acid gives, and this probably accounts for the fact that citric acid is still often used.

Citric acid is more frequently employed for purposes of intensification by reason of its greater power of preserving the clearness of the

solution, and in this respect tartaric acid behaves in much the same way, and gives a coloured image more resembling that obtained with acetic acid; but it is much slower in action if a sufficient quantity be used to duly restrain the reduction, and, on the whole, presents no advantage over citric.

The strength of the pyro solution used may be anything from half a grain to two or three grains to the ounce of water, the alteration in strength acting chiefly upon the speed of the operation, except when more than ordinary density is required, when probably a half-grain pyro solution would not carry it through without renewal. For general purposes, a grain and a half to the ounce of water will prove most satisfactory. The actual strength of the silver solution is quite immaterial, except so far as convenience is concerned in use; but the due adjustment of the proportions of silver to acid is the point that deserves attention. One part of silver to two of citric acid were the proportions used and recommended by many of the old wet-plate workers, and with such plates, under favourable or, indeed, normal conditions, will work satisfactorily so far as regards intensification, while there is no possible chance of fog. But for emulsion films the proportion of restrainer is unnecessarily large, and the intensification under such conditions would be a very slow process, though probably, where patience was brought to bear upon it, the result would not be inferior in the long run; but, for all practical purposes, an equal part of citric acid will be found quite sufficient, for, if in the case of protracted intensification the solution becomes muddy, it is very easy to renew it. I have said that the actual strength of the solution is immaterial, but it should be so adjusted as to afford convenience in use. In old handbooks formulæ will be found varying in strength from ten to forty grains or more of silver to the ounce, and for wet plates, or those which readily intensify with a small quantity of silver, the lower proportion will suffice; but, for emulsion plates, a ten-grain solution would necessitate the use of an inconveniently large quantity, for which reason I prefer to fix the strength at forty grains to the ounce each of silver and citric acid.

But, bearing in mind what has been said regarding the better colour of the image produced with acetic acid, a portion of the restraining may be effected by that means. Thus, if twenty grains of citric acid and half a drachm of acetic be used instead of forty of citric, we have a solution which will keep clear as long as with citric acid alone, will intensify as quickly, and, at the same time, tend to give a warmer and richer colour to the deposit. But it should always be remembered that, in the matter of colour, a comparatively slow intensification with a small proportion of silver will give a warm or brown tone as well as softer gradation and greater fineness of deposit, while the rapid action of a solution containing more silver will tend in the direction of black, harsh, and coarse negatives.

Another combination which gives very excellent results, both as regards rapidity of working and quality of image, and which is, moreover, particularly suited to collodion emulsion, is a mixture of citric and formic acids. The latter acid alone, like acetic, will scarcely keep the solution clear for a sufficiently long time, and it has in addition a tendency to produce a slight veil over the unexposed portions, but, when used in conjunction with citric, these objections disappear. Formic acid is itself a reducing agent, and, when used in this manner, appears to combine that function with the opposite one of restraining, as the intensification certainly proceeds more rapidly and easily than with either citric acid alone or citric and acetic.

As regards the proportions of silver to pyro, it is absolutely impossible to lay down any rule, as so much will depend upon, first of all, the character of the emulsion, the length of exposure, the colour of image required, and, finally, the patience of the operator. One remark, however, may be made, namely, that emulsion plates require a much larger proportion of silver than would be wanted under similar circumstances for a wet plate, so that wet-plate workers turning to emulsion must be prepared to use the silver solution more liberally. I myself use for a half-plate from fifteen to thirty minims of silver solution, of the strength given above, in a couple of drachms of pyro solution; but probably other workers would prefer entirely different proportions.

It is so usual a proceeding to intensify collodion plates before fixing, that I had almost omitted to mention, for the benefit of those who are chiefly used to gelatine plates, that these remarks apply to the intensification of the unfixed negative. But practically the same treatment is equally applicable after fixing. It is in every way preferable to intensify before fixing, but, in case of a miscalculation of the density, the fixed image may prove a little too thin, in which case the same method can be applied. But, especially, as will generally be the case, if hypo is the fixing agent, it will be needful to wash most carefully in order to avoid stains. But a preferable plan, under such circumstances, is to bleach the image with dilute hydrobromic acid, or with bichromate of potash and hydrochloric acid, and to redevelop with alkaline pyro, when the change of colour of the deposit will add considerably to the printing value. This image, again, may be further intensified with silver, as already mentioned, and be, in fact, "built up" to any desired thickness.

Of course, after fixing, where extreme density is necessary, any of the methods of intensification with mercury, lead, or copper salts, may be used, and, in all cases, the action will proceed more smoothly and satisfactorily upon the silver-intensified image than upon one produced by alkaline pyro alone. W. B. Bolton.

PHOTO-MECHANICAL NOTES.

It cannot be disputed that, during the year just ended, there has been a very considerable advance in the quality of the half-tone photo-engraving turned out by English and Continental firms, and, at the same time, American work, good as it was previously, shows a marked improvement. This can only be ascribed to two things—better knowledge and better appliances. For my own part, I believe the improvement is chiefly due to better knowledge, for the appliances in use in 1896 are pretty much the same that were used in 1894–5. The same cameras, lenses, screens, and materials were available, with a few exceptions, then as now, but operators have found out how to use their tools to greater advantage. It is obvious that there must have been some causes operating to influence this extended knowledge, and the reason is not far to seek when it is remembered what an amount of matter has been written during the past two years concerning the theory and practice of half-tone. Yet, in spite of the good effect of this investigation, there are operators who profess to despise theory, and describe in contemptuous terms the results of the patient labours of scientific investigators who have endeavoured to enlighten the trade on the principles that lie beneath their processes. These detractors have unconsciously been influenced by the improvement which has been going on, and have adopted methods which they have heard other operators have been practising, not knowing, or not caring to know, that these new methods were the result of the theoretical work which has been in progress.

It may be interesting to trace the course of this theoretical investigation. Up to the early part of 1894 nothing had been published, so far as I am aware, on the theory of half-tone, except one or two references by Mr. F. E. Ives in addresses to some American and English societies, and which were evidently overlooked by the majority of process workers, or their importance not fully appreciated. The appearance of Mr. Ives's address in the *Journal of the Franklin Institute*, May, 1888, is the first reference to the theory of half-tone; and this was supplemented by a further reference to the matter in the *Journal of the Camera Club*, in April, 1894. In the latter Mr. Ives said: "The real explanation of this peculiar power of the cross-line screen lies in its function as a cross-line screen to produce minute pinhole images of the aperture in the diaphragm on the sensitive plate. At a certain distance between the screen and sensitive plate, the screen will produce the image of any shape of aperture in the diaphragm that may be desired."

I had not myself seen these references when I wrote in my Notes in this Journal, May 18, 1894 as follows: "Considering the vastly increasing importance of the subject, it is surprising that so little attention has been paid to the question of the optical principles involved in the production of the divided negatives used in the half-tone photo-engraving processes. It is not to be expected, of course, that process workers in general should have an intimate knowledge of the mathematical niceties of photographic optics, but some of the recognised authorities might do well to turn their attention to the subject, and, with their usual public-spiritedness, give us some basis to work upon." The context described the considerations involved, and concluded by inviting the attention of

ptical experts, "not for the mere explanation of the thing, but because hey may indicate fresh lines for improvement in methods of half-tone ork."

The next we hear of the theory of half-tone is the publication of a atent specification of Dr. Albert, of Munich, dated August 25, 1894, laiming the invention of improved stops, which were nothing more than ad been described by Mr. Ives at the Camera Club, and which had been n use in America a long time previously, as I had pointed out in my Notes of the preceding May. The specification was, however, interesting s a further contribution to the underlying principles of the process, and timulated Mr. Max Levy to produce, in the December issue of *Paper and Press* (Philadelphia), an illustrated article describing the influence of the hape of diaphragm on the half-tone image. Before the article was ublished in this country in *The Process Year-Book* for 1895, Professor Burton had evidently been at work on the theory of the process and sent a paper to be read at the London and Provincial Photographic Association containing some references to the point at issue. Professor Burton put orward the sound theory started by Levy, and which has practically been pheld since, that in the formation of the half-tone dot diffraction played an important part.

"Briefly stated," said Prof. Burton, "it must, of course, be admitted that he image, as a whole, is a dioptric image, formed in the way of ordinary photographic images, which can be traced geometrically by following the pencils of light. I believe, however, that the individual dots are not dioptrically found, but are diffraction images of the diaphragm of the lens. If this be not so—or at least if the dots be dioptrically formed—why should not contact with the plate be the best position for the screen? and, still more, why should alteration of the distance make so marked a change, in not only the size but the shape of the dots? A change not to be accounted for dioptrically. I have a confirmation of my theory in the peculiar form and position taken by the dots that represent the well-defined boundary line between a strongly contrasted light and dark shade or tone."

At a subsequent meeting of the same Society the theory was discussed, and results of experiments shown. The diffraction theory was upheld by Mr. Haddon, Mr. E. J. Wall, and myself, but dissented to by Mr. Debenham, who held, and I believe still holds, that all the phenomena of the half-tone dot formation can be accounted for on the theory of parallax.

In my Notes in this JOURNAL, April 19, 1895, I gave the results of my own investigations into the theory of the subject, and my reasons for upholding the theory of diffraction.

Messrs. Tallent and Dollond, of the Polytechnic, had been pursuing investigations into the subject, and on April 23 brought before the Royal Polytechnic Society a paper recording their results. They worked to the theory of shadows and penumbra, and regarded the action of the screen from the point of view that a cone of light proceeded from the diaphragm through the screen, and had its apex on the sensitive plate. When the position of the screen was so adjusted that this cone passed through the screen apertures with the least obstruction—that is to say, a section of the cone at the point where it cut the screen fitted the opening—there was maximum intensity of illumination, and consequently the correct relationship between screen and diaphragm. Mr. Dollond stated they had made no absolute experiments with regard to diffraction, but, as their experimental results agreed closely with calculated results, not allowing for diffraction, he thought there was no appreciable effect.

Almost simultaneously with the last-mentioned paper appeared an English translation of Dr. Eder's famous article on the subject. The gist of Dr. Eder's conclusions was that the dots are actually the pinhole images of the diaphragm and the penumbral cone crossing in front of the screen aperture, and gradually becoming weaker at the edges, broadens the dot, according to the brightness of the light and the length of exposure, diffraction phenomena playing only a secondary part.

Numerous papers have been published since, notably those of Deville and Turati, all contributing their quota to the general knowledge of the process, but none, to my mind, settling the question and giving process workers in general a definite opinion on the underlying principles of the process, apart from intricate diagrams and equations, which only appeal to a few ultra-scientific workers.

I do not think that the conclusions on the theory of either pinholes or penumbra are absolute. Both fail to account for the fact that good half-tone negatives—I will go so far as to say the best—are made at distances which preclude the possibility of penumbral or pinhole calculations working out correctly.

If the dots were to be accounted for entirely on the theory of pinholes, one screen distance would suit at all times, if the diaphragm were enlarged or reduced in proportion to the camera extension; and, further, if we doubled the size of the diaphragm, we should double the size of the dot, which is not the case, as Dr. Eder has correctly pointed out.

Again, if the dots are to be accounted for by penumbra, either in conjunction with or apart from, pinhole effect, we do not account for the fact that we can get dots considerably smaller, as well as considerably larger, than the screen opening, and of almost equal density and sharpness.

According to the penumbral theory, the more we enlarge the diaphragm, the greater will be the spreading of the dot, whilst, the more we reduce the diaphragm, the more sharply we make the dot conform to the size and shape of the screen opening; but, under no circumstances, can it be urged, on the penumbral or pinhole theory, that a small stop would give a dot smaller than the screen opening, nor that the dot formed by the small stop would be otherwise than of the shape of the screen opening.

Yet it is a fact that a round dot smaller than the screen opening can be produced in the shadows, whilst, at the same screen distance, a dot as much larger than the screen opening as desired can be produced by enlarging the diaphragm. This effect is obtained by a method tending to promote diffraction, and, in fact, at a screen distance, and with an aperture that would give the maximum amount of diffraction, if we sought for diffraction alone. A further curious fact, not accountable on any theory of penumbra or pinhole, is that the tiniest diaphragm, say, one-sixteenth of an inch in diameter, will, at the proper distance, produce more density in the same time than will a diaphragm double the size at a screen distance calculated on the rules laid down by Dr. Eder.

It is further a fact that more tone and detail will be obtained, and with quicker exposures, by working according to the diffraction theory than according to the penumbral theory. The difference between the one theory and the other is that, by accepting diffraction as a factor, we work for the shadows, and eventually get the high lights, but by the other way we work for the high lights, and never get the shadows at all except by fictitious means. It is just here where European half-tone work differs so much from American work. The former is "screeny," and has got the process the bad name that it is harsh and mechanical, whereas the latter has been rich in tone, full of detail, and with a minimum of screen effect. If this difference is not so marked now, it is because American methods, and in many cases American workmen, have been imported into English and Continental process establishments.

The fact is, our professors on this side have given us a wrong theory to work upon. They have failed to grasp what is really the "American process," and it is time they reconsidered their deductions. They have thrown overboard the theory of diffraction without good and weighty reason, without in fact stopping to investigate it. It is not sufficient to say diffraction does not exist because all the phenomena of the half-tone process can be accounted for on the hypothesis of penumbra. When two such indisputable authorities as Mr. Max Levy and Mr. F. E. Ives give their support to the theory of diffraction, as well as practical proof of its effects, theorists who deny its importance ought to prove their words, for "the onus of proof is with the accuser." I only put this challenge forward in the interests of scientific truth, and not by way of provoking any acrimonious discussion.

I do not question the value of the numerous investigations which have been made; on the contrary, they have been most interesting and useful; but unfortunately they have been taken from a wrong standpoint, or have not gone far enough. It is to be hoped, therefore, that in 1897 the investigation of the theory of half-tone will be continued and completed.

WILLIAM GAMBLE.

FOREIGN NEWS AND NOTES.

New X-ray Tubes.—A special tube has been introduced by Greiner & Friedrichs, of Stutzerbach, the walls of which are composed of the almost black manganese glass, with a window of white glass opposite the anticathode. The idea of this is to prevent the fluorescence of the glass being troublesome when using a fluorescent screen. Another form has also been made by H. Frister, of 23, Lindenstrasse, Berlin, S.W.; this is globular, with a long stem up which passes the cathode, which ends in a concave aluminium plate, the anode being an aluminium ring placed midway in the tube, whilst at the opposite end of the tube is the anticathode, a fairly large plate of platinum. With this tube Eder has obtained the radiograph of a hand in thirty seconds, and one of an elbow in one minute, the distance of the tube being ten inches.

Aluminium for Collotype.—Aug. Albert strongly recommends, in the current number of the *Photographische Correspondenz*,

the use of aluminium plates for collotype. As alkalies attack aluminium, dilute sulphuric acid 1 : 30 should be employed to clean used plates. Printing is much more convenient, as the aluminium can be bent back in the printing frame. Aluminium plates give deeper blacks, without blocking up, than glass, and the first pull from the plate is perfect, whilst with glass at least twenty or thirty are required before a perfect one can be obtained.

The Inventor of the Cinematograph.—It has often been said that there is nothing new under the sun, and some photographers are rather prone to point out that somebody has done something years before somebody else, and now Mr. J. Sachers, of New York, throws a little light on the early history of chronophotography. Titus Lucretius Carus, in his work *De Rerum Natura*, book iv. verse 766, which was published during his life (99–65 B.C.), has the following passage :—

> "Quod superest, non est mirum simulacra moveri
> Brachiaque in numerum jactare et cetera membra ;
> Quippe ubi prima perit alioque est altera nata
> Inde statu, prior hic gestum mutasse videtur ;
> Scilicet, id fieri celeri ratione putandumst."

which may be freely translated by—

> "Do not thou, moreover, wonder that the images appear to move,
> And appear in one order and time their legs and arms to use ;
> For one disappears, and instead of it appears another
> Arranged in another way, and now appears each gesture to alter,
> For you must understand that this takes place in the quickest time."

Whether we agree with Mr. Sachers or not, the idea of series movements is here presented. In the *Journal of the Royal Institution*, vol. i. p. 205, appears a statement of Faraday's, which shows that he recognised the principle, and from this, probably, Stampfers stroboscope, and Plateaus phemacistoscope were taken, this latter being described in his work, *Dissertation sur quelques Propriétés des Impressions Produites par la Lumière*, published in 1829. In 1845 Uchatius made an instrument, which showed moving images to a large number of people at once, and perfected this in 1853. In his instrument the series of images were painted on a transparent support, and were arranged in apertures of a circular wooden disc. Behind one of them was a lamp and condenser, and then, between the transparency and the screen, a projecting objective was placed. A second screen, with apertures in it, was attached to the same axle as the transparency screen, and the whole was enclosed in a box, with only the handle and objective outside. An American patent, (No. 93,594) was taken out on August 10, 1869, for a revolving perforated screen, in connexion with an arrangement to give an intermittent movement to the image plate.

Marginal Fog.—Herr Hans Schmidt after reviewing the various theories advanced as to the cause of marginal fog in plates, advances the view that it is due to the gases given off from the paper or card of the box and the separating paper, which have absorbed the moisture from the glue, paste, or other material used in packing the plates up, and in consequence of which the paper becomes fusty or mouldy, and thus gives rise to the gases which act prejudicially on the plates. Whilst this may be the cause in certain instances, there is not the slightest doubt that in others it is due to unequal drying of the emulsion, for the marginal fog may be seen round two sides of a plate, whilst the other two are quite free, and this is always the case when the plate is small and has been cut from a larger one.

Brown Images.—Rhenanus considers, in the *Photographische Rundschau*, the composition of the negative image, and he hardly agrees with Starnes and Liesegang that the image with pyro-developed negatives always consists of silver and a dye, and he comes to the conclusion that alkaline developers, such as pyrogallol and hydroquinone, can produce perfect images on exposed silver bromide, by the colouring matters produced by oxidation, without any reduction of the silver taking place, and that the same developer may produce also a composite image composed of silver and colouring matter. He also states that the colouring matter is deposited on the solarised silver bromide alone, as it is generally assumed that the solarised silver bromide is an oxidation product, that it contains bromine and oxygen, and that this oxygen combines with the developing agent and forms the brown image.

JONES *VERSUS* THE MEMBERS OF THE LINKED RING.

[By Our Special Reporter.]

The above action was down for trial in the County Court for Thursday last, and, acting on instructions from the Editor, I attended to give some account of the proceedings.

Mr. Ince-Ayne, Q.C., for the plaintiff, said that the action was brought under the Food and Drugs (Adulteration) Act, 1883. His client had visited an Exhibition recently held by the defendants in Piccadilly, and had purchased thereat certain things alleged to be photographs. On examination by an expert, he had ascertained that they were not what they purported to be, but were adulterated to a very large extent with other matter. The learned Counsel submitted that coming, as he should proceed to show, under the title of drugs, if not of food, a breach of the Act had been committed for which he should ask exemplary damages.

Mr. Mixtink, F.I.C., F.C.S., examined by Mr. Ince-Ayne, said he was a professional analyst and had had the plaintiff's purchases submitted to him for examination. The average of three determinations gave their composition as approximately the following :—

Foreign matter (not identified)	41·79
Brown paper	12·02
Brush work	12·31
Foot marks	33·88
Photograph	traces.
	100·000

He declined to regard such a composition as in any sense of the word a photograph.

Cross-examined by Mr. Psyllie, for the defendants: He regarded ten guineas for such a production as excessive. The brown paper had a commercial value in its clean state, no doubt, but the expense of recovery would be too great in this case to make it worth anybody's time to do it. He had heard of ten guineas and upwards being given for a black-and-white sketch, but in such a case it was the work of a trained artist.

Captain Abneigh, F.R.S., &c., was called: He had seen the Exhibition referred to. The effect of the works in question upon him was to superinduce extreme nausea and giddiness. They acted to all intents and purposes as a violent emetic.

Cross-examined: He had not had salmon for lunch on the day in question. Salmon, and indeed fish generally, agreed with him. There was no truth in the allegation that his (Captain Abneigh's) half step sister-in-law and plaintiff's mother's aunt were related.

Formal evidence of the purchase having been given, Mr. Ince-Ayne said that concluded his case. That the things bought were not pure photographs, but were heavily adulterated, Mr. Mixtink had shown, while Captain Abneigh's evidence indicated beyond a shadow of a doubt that they were emetics, and therefore "drugs" in the meaning of the Act. He put in a copy of the *Immature Photographer* in which the Exhibition in question was described as containing "food for reflection" which Counsel submitted could only refer to the exhibits; these, then, were within the Act both as food and as drugs.

Mr. Psyllie, in the absence of Mr. Sawney, Q.C., M.P., for the defence, said that this action was brought against a number of gentlemen who met together under the title of the "Linked Ring," the individual members being known as "Links." He appeared for all the Links except Mr. Alfred Marshall, the Hon. Secretary, who was apparently abroad and inaccessible.

His Honour: I suppose we may regard him as the "Missing Link." (Laughter).

Mr. Psyllie would not go into that. He should call evidence to show that his clients had not deliberately sold, at a high price, goods they knew to be adulterated. These were high-minded gentlemen who he should show were subject to delusions. Some believed themselves to be gifted writers, all entertained the idea that they were real artists. Some believed that they left another society because it did not sufficiently encourage art, although it was said that they did so because that body declined to take them at their own valuation. In other cases he should show that they regarded themselves as the salt of the photographic earth, their Exhibition as a photographic one, the rest of the photographic world as bitterly hostile to themselves, photography as a graphic art little, if at all, inferior to painting or sculpture, and the Royal Photographic Society as an effete and dying institution craving for their support as a drowning man clings to a straw. In other words, in this particular direction their ideas were so extraordinary, and so entirely the opposite to the facts, that he thought the Court would have little difficulty in regarding the attempt to hold his clients responsible for their actions as a miserable subterfuge, and an abuse of the process of the law. (Applause in court which was immediately suppressed.)

Drs. Loonie and Woodhead gave evidence to the above effect.

The jury, without retiring, intimated that they were satisfied that the defendants were subject to delusions.

His Honour dismissed the case, but declined to make any order as to costs. Leave to appeal was given.

ACETYLENE.

[Cantor Lecture delivered at the Society of Arts.]

At the present time the introduction of acetylene gas, made by acting upon calcic carbide with water, and which is at once the most easily made and the most brilliant of all known gases, promises a complete revolution in domestic lighting where coal gas is not to be obtained; but much has yet to be done in educating the public as to the proper way in which to use it, as well as in the character of the calcic carbide, from which it is produced, and in the forms of apparatus employed to generate the gas.

Acetylene, or, as it is sometimes scientifically called, ethine, is a gaseous compound of twenty-four parts, by weight, of carbon, with two of hydrogen, and was first discovered and isolated by Edmund Davy in 1836, but it was not until 1859 that Berthelot's investigations gave the scientific world a clear conception of its interesting character and properties. Since that time it has been frequently prepared in small quantities by tedious and costly processes, and it is only within the last few years that a cheap and simple method has been discovered, and has brought its use within the range of commercial possibility.

The fact that carbon and lime could be made to directly act upon each to form calcic carbide was discovered independently by Willson in America, and in France by M. Moissan, but there exists abundant proof that Willson was making and experimenting with calcic carbide, and had sent specimens of it to various correspondents some time before Moissan had made any announcement of his discovery, and therefore priority undoubtedly rests with the American discoverer.

Calcic carbide is a dark grey substance, having a specific gravity of 2·262, and, when pure, a pound of it will yield on decomposition 5·8 cubic feet of acetylene. Unless, however, it is quite fresh, or means have been taken to carefully protect it from air, the outer surface becomes slightly acted upon by atmospheric moisture, so that in practice the yield would not much exceed 5 cubic feet. The density and hardness of the mass, however, protect it to a great extent from atmospheric action, so that in lumps it does not deteriorate as fast as would be expected; but, in the powdered condition, it is quickly decomposed.

On the addition of water to the calcic carbide, a double decomposition takes place, the oxygen of the water combining with the calcium, and once again forming lime, whilst the hydrogen unites with the carbon of the carbide to form acetylene.

At the present moment the future of acetylene as an illuminant is largely dependent upon two factors—the commercial production of calcic carbide of a reasonable degree of purity; and, secondly, methods for safely making and burning the gas in such a way as to develop its full illuminating power, whilst doing away with the risk of smoking; and, as I first drew attention to the production of the carbide, and from it of the acetylene on a commercial scale in this country, I feel that the results of the past two years' experience will not be without interest.

In spite of extended experience, both here and abroad, in the manufacture of calcic carbide, the details given as to its cost and the price at which it can be purchased offer the most entertaining reading, as, whilst the patentee and would-be seller of acetylene generating plant still talk airily of the cost of the carbide being anything from 30*s.* to 7*l.* a ton, the price at which one can purchase carbide more nearly approaches 30*l.* Indeed, in Paris, at the present moment, there is considerable difficulty in getting it at 40*l.* a ton, although we are informed that this is merely due to a temporary carbide famine, and that the new sources of supply will soon reduce the selling price even below 16*l.* a ton, at which it stood before the late rise in price. Be this as it may, the factor which interests us is the price at which carbide can be obtained in England, and the Acetylene Illuminating Company, who hold the Willson patents for the production of carbide, and also the Cowles electric furnace patents, which, I believe, enable them to control the manufacture of carbide in this country, have fixed their selling price at 28*l.* per ton; and, although there is no doubt that they will give contracts in considerable quantities at a reduction on this price, yet it is with the factor of the selling price to the public, and not with the manfacturing price, that we have to deal.

In most cases, the possible prices quoted for calcic carbide by inventors, who have been carried away by their wishes rather than by hard facts, are simply absurd, and far below the price at which the substance can be produced, and it may be of interest if I give the figures for the electric power necessary, which I myself have obtained in practice in the manufacture of calcic carbide.

Having been kindly granted the use of the electric plant erected for the manufacture of calcic carbide at the experimental works of the Acetylene Illuminating Company, a plant capable of working continuously at from sixty to seventy volts at 1000 to 1200 ampères, I made a series of experiments in order to determine the best proportions in which to mix the ingredients from which the carbide is manufactured, and to find out the amount made per electric horse power.

The production of carbide from lime and carbon, under the influence of the heat of the electric furnace, appears to take place according to the formula—

$$CaO + C_3 = CaC_2 + CO,$$

and, in order to obtain this reaction, it would be necessary to use 56·1 per cent. of lime mixed with 43·9 per cent. of carbon. In practice, however, it must be remembered that the carbon used will either be finely powdered coke or charcoal, neither of which is pure carbon, whilst the lime employed will always vary in purity, such variations having, as I shall presently show, a very important bearing upon the purity of the carbide and acetylene produced from it. Another practical point also presents itself, and that is that, unless the mixture is suitably arranged, considerable variations in the amperage and consequent loss of efficiency in the furnace will result.

Using a mixture of 60 per cent. of lime and 40 of carbon, a run lasting 3½ hours yields about 112 lbs. of fused ingot, and of this 81 per cent. was practically pure carbide, the remainder being a crust of lower value.

The mixed carbides yielded 5 cubic feet of gas per pound, and contained 89·2 per cent. of true carbide, hence the yield may be taken as being 32 lbs. per hour of the commercial carbide.

The current used was 60 volts at 1000 ampères or 89 E.H.F., which gives, as the make, about 0·4 lbs. per E.H.P. per hour, and the result of continued experiments shows that 0·3 to 0·4 lbs. per E.H.P. per hour is the average yield.

The cost of the electrical horse power will, of course, vary with the source from which it is obtained, and the use of steam power for generating the electricity appears too costly to be entertained, unless the present electrical lighting stations could see that it was to their advantage to level up their load by manufacturing the carbide under licence when not employed in supplying current directly for illuminating purposes. The Acetylene Company have, however, secured considerable water power at the Falls of Foyers, and a full installation of carbide plant is at work there, whilst still further water power has been secured in a convenient position, and additional works will be erected; but it will always be the demand, and not the cost, of the carbide which will govern the price.

The following yields of acetylene, from various samples of commercial carbide that I have analysed, give an idea of the variations to be found in the article:—

Swiss carbide per lb.—I. yielded 4·38 cubic feet of acetylene; II. yielded 4·60 feet; and III. yielded 4·56 feet.

German carbide per lb.—I. yielded 3·82 cubic feet of acetylene; II. yielded 3·46 feet; III. yielded 3·24 feet; IV. yielded 2·43 feet.

English carbide per lb.—I. yielded 5·24 cubic feet of acetylene; II. yielded 4·84 feet; III. yielded 5·04 feet; IV. yielded 5·52 feet; V. yielded 4·84 feet; VI. yielded 5·32 feet.

It is evident, therefore, that there are wide differences in the commercial article, but, with reasonable care in the manufacture, the carbide should yield an average of 5 cubic feet of acetylene per pound.

The gas obtained from the English carbide is very pure, the chief impurity being 2–3 per cent. of sulphuretted hydrogen, due to sulphur in the coke and gypsum in the lime, whilst with many of the Continental samples 6–9 per cent. of impurities is by no means uncommon, one of the principal and most dangerous impurities being phosphuretted hydrogen, which is evidently due to the use of phosphatic lime in the manufacture of the carbide, and also traces of siliciuretted hydrogen. So bad is this with some samples that the acetylene produced from one batch obtained from Denmark actually gave a haze when burnt for some time in a small room.

It is manifest that, if the carbide is contaminated with calcic phosphide, the action of the water on it must give rise to a certain quantity of spontaneously inflammable liquid phosphuretted hydrogen as well as the gaseous compound, and the liquid condensing during compression or in the storage holder is a very grave source of danger. No lime or coke should be used in the manufacture of carbide which contains more than the smallest trace of phosphates, and, if this point is not more carefully attended to than it is at present in some of the Continental works, serious accidents are sure to follow; whilst, if this be done, as is the case in the manufacture of English carbide, no danger from this cause need be apprehended.

Ammonia is also found as a frequent impurity in acetylene, and gives it the power of attacking copper with the formation of an explosive compound.

In the paper which I read before the Society of Arts in January, 1895, on acetylene, I pointed out the ease with which the acetylene was liberated from the carbide by the action of water, and suggested several forms of apparatus in which such decompositions might be brought about. These suggestions were followed by a rush of would-be inventors upon the Patent Office, the literature of which has been increased to an alarming extent during the past two years by patents, many of which are characterised neither by novelty nor utility, and which, moreover, are in cases fraught with considerable danger. With the further experience which I have gained in the production and properties of this gas, I now see that many of the hints which I threw out in that paper as to the construction of apparatus would be fraught with many drawbacks, as, although most of the dangers with which acetylene was then credited have disappeared into thin air, some other totally unexpected ones have taken their place, and, most manufacturers of acetylene apparatus being still ignorant of these, a lively time may be expected for those who employ apparatus constructed by people who, possessing a limited mechanical knowledge,

know absolutely nothing of the properties of the gas with which they are dealing, and these are certain to give rise to many troubles in use, and so retard the utilisation of this beautiful illuminant.

In the generation of acetylene from calcic carbide far too little attention is being paid to the high temperature evolved when any considerable quantity of it is brought into contact with water, and the effect which this has upon the gas. Several attempts are being made to introduce automatic machines for the generation of acetylene on the principle of the ordinary "Kipp's" sulphuretted hydrogen apparatus; indeed, several of them are only modified copies of this in metal, and the idea of the manufacturers is evidently that the action will cease, and the evolution of acetylene be stopped, when the pressure of the gas drives the water back from the carbide; but this is not so, as the heat of the action saturates the gas present with water vapour, and, as the apparatus cools, this recondenses on the carbide and produces more gas, whilst the unchanged carbide will decompose the vapour before condensation, and even dehydrate the calcic hydrate which was formed on its surface when the water was in contact with it. The result of this is that, after the gas has once been made, no automatic arrangement will stop the slow generation of the gas from the carbide in the apparatus.

When the gas is being continually used, this does not matter much, as the slowing down of the evolution of the gas is sufficient to allow the consumption to catch up the make; but, when the gas is turned off, if any quantity of carbide be undecomposed, the automatic generator, with its small holder, become an active danger, as it will either "blow" or generate dangerously high pressures.

In any form of generator where the quantity of carbide is large, the heat generated by the action of the water on the material is quite sufficient to polymerise some of the acetylene into tarlike products, which will sometimes cause trouble and stoppages in the pipes, whilst in any case the high temperatures cause a large amount of steam to go forward with the gas, and, unless special precautions are adopted to prevent it, such as using a sufficiently large holder, some of this is carried forward to the service pipes.

There is no doubt that, for the use of the gas in country houses, a holder large enough for the evening's supply should be provided, and the generators not charged with more carbide than is necessary to yield a volume of gas equal to the capacity of the holder.

The dangers of acetylene, of which a good deal has been heard lately, are almost entirely dependent upon the use of impure carbide and improper apparatus. Pure acetylene has now been shown to be less poisonous than ordinary coal gas, and far less so than coal gas enriched with carburetted water gas, whilst the action of pure dry gas on metals is practically *nil*.

It is well known that acetylene can be resolved into its constituents by detonation, and the idea has arisen from this fact that acetylene is itself an explosive of great power. This is, however, an error, as it has been clearly shown that, when the gas is under ordinary atmospheric pressure, if detonation is started in acetylene by a charge of mercuric fulminate, the explosion only extends a few inches from the detonator, whilst the explosion in acetylene of acetylide of copper is insufficient to set up detonation of the gas under these conditions.

This, however, only applies to acetylene under ordinary pressure, and any attempts to liquefy acetylene by the pressure created by the evolution of the gas from calcic carbide is an extremely dangerous operation, as, if the heat of generation be added to the heat evolved during compression, an action akin to detonation is very likely to take place with the resolution of the acetylene into carbon and hydrogen.

Out of the many forms of generator which have been patented in this country and abroad there are some which, although there is no very startling novelty in construction, yet afford safety in use, and intending users of acetylene apparatus should make sure that the generators they employ have been examined and certified as safe by some competent authority.

I have pointed out some of the troubles existing in the generation of acetylene on a commercial scale, but, given a good form of generator, the trouble which still exists is that there are but few burners at present manufactured which can be relied upon to consume it in such a way as to develop from it its wonderful illuminating power for any great length of time without smoking, and, when the burner itself starts smoking, it can easily be realised that its capabilities in that way are immense.

For domestic illumination a burner consuming more than 1 cubic foot of the gas per hour would have too intense a light to be practically usable, and I have found it possible to make a burner which, for this consumption, shall emit a light of from thirty-two to thirty-four candles, which is ahead of the duty obtained for the same consumption by any other burners which I have tested; but with all burners, good and bad alike, after a certain period of perfect burning, which may extend to several hundred hours, a time is sure to arrive when the burner commences to smoke, and, as a rule, all that can be done with it is to take it out and put in a fresh one. The cause of this is that in all burners fitted for the consumption of acetylene the holes or slits through which the gas issues have to be excessively fine, and in time the heat of the burner causes the polymerisation of some of the acetylene into liquid hydrocarbons, which, being decomposed in the hole or slit, give rise to a slight carbonaceous deposit and the growth of carbon filaments from the outlet. The carbon filaments can easily be removed when they make their appearance, but the partial stoppage in the fine aperture of the burner itself upsets the balance of the burner and causes smoking.

The fact that burners can be obtained cheaply which for a limited time give satisfactory results enables dealers to sell burners and to declare that no such trouble exists, but the public who are induced to buy will soon discover the facts for themselves.

Acetylene is soluble in water and many other liquids. At ordinary temperature and pressure ten volumes of water will absorb eleven volumes of the gas, but, unless the gas be bubbled through the water, the absorption is hardly noticeable in the case of an ordinary receiver or gas-holder, as the surface of the water rapidly becomes saturated, and after that the absorption is very slow, whilst, when the whole bulk of water is completely saturated, the absorption stops.

The solubility of the gas may also be largely done away with by dissolving salt in the water surrounding the gas-holder; but this has a destructive action upon the metal of the holder, and it is therefore better to use ordinary water as the liquid over which the gas is collected and stored.

The gas can be condensed to a liquid under a pressure of 21·53 atmospheres, or 323 lbs. at a temperature of 0° C., whilst at ordinary temperatures the pressure necessary to keep it in the liquid state is from 500 to 600 lbs. on the square inch, so that the liquefied gas can readily be stored and transported in steel cylinders of the kind employed for liquid carbon dioxide.

The liquid so produced is mobile and highly refractory, and when sprayed into air the conversion of the liquid into the gaseous condition absorbs so much heat that some of the escaping liquid is converted into a snowlike solid, which takes fire on applying a light to it, and burns until the solid is all converted into gas and consumed.

The possibility of liquefying acetylene at pressures about those at which liquid carbon dioxide is produced so largely enables considerable volumes of gas to be compressed into the liquid state in small wrought-iron or steel cylinders, and in this condition, by means of suitable reducing valves and burners of the right construction, it may be stored and burnt. The small cylinders can also be arranged in the form of portable lamps, whilst for use in the country, where no gas is available, a large cylinder of the liquid gas placed in an outhouse would supply a country house with light for a very long period.

It is now well recognised that all luminous hydrocarbon flames owe their light-giving properties to fine particles of carbon liberated within the flame by various processes of decomposition, and raised to incandescence partly by the heat of the flame, and partly by the heat generated by the same actions which caused the separation of the carbon, and it is to the formation of small traces of acetylene in all hydrocarbon flames that a large amount of their luminosity is due. We should therefore expect that acetylene when burnt by itself would be the most brilliant of all gaseous illuminants, an expectation which is fully borne out by the results in practice.

Acetylene gas, when burnt, gives a flame of intense brilliancy, and, owing to its richness, it can only be consumed in small burners. Under these conditions it emits a light greater than that given by any other known gas, its illuminating value, when properly developed, calculated to a consumption of 5 cubic feet an hour—the average consumption of ordinary coal gas—being no less than 240 candles. It is thus seen that, when acetylene is burnt in suitable burners, it develops an illuminating value fifteen to twenty times greater than that obtained by the combustion of the same volume of coal gas, so that, for all practical illuminating purposes, a very small consumption of acetylene in the burners which practice has shown to be best suited for the purposes, does the illuminating work of a very large volume of coal gas, with the result that the air of the room is but little contaminated with the products of combustion, and the excessive heating of the upper portions of the air is reduced to a minimum.

The following table contrasts the products of combustion evolved from London coal gas when consumed in various forms of burners, and giving an illumination of forty-eight candles, which may be presumed to be the amount of light required in a fair-sized London dining-room, and contrasted with this is the amount of the products of combustion which acetylene would evolve in giving the same amount of light, whilst, to make the meaning clearer, I have added the number of adults who would exhale the same amount of carbon dioxide in the same time :—

Burner.	Gas consumed.	Carbon dioxide.	Adults.
Flat flame, No. 6	19·2	10 1	16·8
,, ,, ,, 5	22·9	12·1	20·0
,, ,, ,, 4	25·3	13·4	22·3
London Argand	15·0	7·9	13·1
Acetylene.....	1·25	2·50	4·5

If we obtained the same amount of light from paraffin lamps, the carbon dioxide evolved would be equivalent to 22·5 adults; whilst, as far

as carbon dioxide goes, you might as well invite 32·7 more guests to dinner as use 48 sperm candles to supply the needed illumination.

It has been said that the danger of an explosion from a leakage of acetylene is far greater than with coal gas. This is, I think, a mistake. Mixtures of air and acetylene are explosive over a slightly wider range than is the case with mixtures of coal gas and air; but it must be remembered that, if a leakage were caused by a tap being left on, the largest acetylene burner would probably only pass 1 cubic foot of gas per hour, whilst an ordinary No. 4 or 5 union jet burner would pass 5 to 6 cubic feet of coal gas in the same period of time, and from this cause, therefore, would be far more dangerous than acetylene; whilst, if the leak were from a small crack or a leaky joint in a pipe, the rate at which the gases diffuse out would be dependent upon their specific gravity. Coal gas has a specific gravity of 0·4 as against 0·9 for acetylene; so that through a crack or fissure of the same size only two volumes of acetylene would escape, whilst three volumes of coal gas would find their way into the air, a difference in rate which would more than cover the slight difference in the limiting proportions of explosion, and very little experiment will clearly prove that acetylene cannot in any way be looked upon as more dangerous to property than coal gas.

The field for acetylene at the present time is simply enormous, as not only is it specially adapted for the lighting of country houses and small villages and towns where no coal gas supply at present exists, but it will probably, in the near future, take the place of existing forms of lighting in railway carriages, tramcars, floating buoys, &c., whilst, as an auxiliary to the electric light for lighthouses, search lights, and coast defence, it will, I believe, be of the greatest possible value.

Should any cheapening of the production of the calcic carbide take place, there is even a larger sphere of usefulness awaiting it—a sphere, moreover, in which the troubles found in the consumption of acetylene, *per se*, will entirely disappear. There are many places in this country where the cost of good gas coal makes coal gas prohibitive in price, whilst on the Continent these troubles exist to a far greater extent, and, if it were commercially possible to use acetylene as an enricher of a cheap fuel gas, an enormous field would be opened up.

PROFESSOR VIVIAN B. LEWES.

(*To be continued.*)

INCANDESCENT MANTLES.*

THE illumination of outdoor spaces and roadways calls for very different treatment to the lighting of the interior of our houses. In this form of lighting there is no reflection from the ceiling to help the feebleness of the downward radiation, and reflectors become almost a necessity. It is in outdoor illumination that the Welsbach incandescent mantles find their true application, and any one who has seen the magnificent effect produced by their grouping in the Champs Elysées, and the way in which they entirely dwarf the electric installations in their immediate neighbourhood, must feel that both in economy and effect they are the best outdoor illuminant that can be obtained, and, with the standards placed at sufficiently close intervals to prevent zones of darkness between them, leave little to be desired.

Even here, however, one finds circumstances under which the colour of the light emitted by the Welsbach mantle is a drawback.

Observation shows us that, as long as the atmosphere is sufficiently clear to enable us to see the sun or moon apparently white, but little difference can be noticed in the penetrating power of our outdoor illuminants, but, as soon as the sun or moon begins to show a yellow or reddish tint, we immediately begin to notice that the arc light or the incandescent Welsbach mantle begins to fade far more rapidly than the ordinary gas lights, and that even in the thickest fog the gas flame, oil lamp, and even candle, seem able to battle more successfully with the atmospheric conditions than their more pretentious rivals.

Although this is perfectly clear to the eye, as far as I know, no attempt has been made to ascertain the ratio of percentage of light so absorbed amongst our ordinary illuminants themselves, although Professor Tyndall's beautiful work on lighthouse illuminants shows clearly the differences which exist in this respect between the electric light and the light due to gaseous flames.

The explanation of the yellowish-red appearance seen during a fog is that it is caused by the filtration of the light rays through the minute particles of which the fog largely consists, and the same effect is produced when the sun is seen through smoke. The colours in the spectrum are produced by variations in the wave-lengths, the difference from crest to crest of the red rays being large as compared with the wave-lengths which give the blue-violet end of the spectrum, and the gradual decrease in the distance between the crests is found to take place from the red rays down to the ultra-violet, and, when the bundle of mixed rays which we call white light comes to penetrate the finely divided mass of particles, the small and rapid waves of the blue and violet become checked and absorbed, whilst the waves of greater amplitude are able to find their way through the obstructions, the result being that the light which reaches our eye, being bereft of a large proportion, at any rate, of the blue and violet rays, has a preponderance of the light from the other end of the spectrum, and therefore appears red or orange in colour according to the thickness of the obstruction through which it has passed.

A very beautiful way of showing this is to cause the horizontal rays from an electric lantern to pass through a cell containing a dilute solution of sodium hyposulphite, when a white disc is formed on the screen. On now adding some hydrochloric acid to the hyposulphite, a gradual separation of particles of sulphur takes place and forms a cloud in the liquid, and, this behaving in the same way as the solid particles suspended in the fog, the disc of white light is seen to go through the changes of colour so familiar to Londoners during the fall of the year.

I have attempted to utilise a modification of this experiment in order to determine the power of penetrating fog which our illuminants possess, and to do so constructed a glass cell 18 inches deep by 18 inches wide, by 3 inches thick. It was filled with a solution containing 0·1075 grammes of sodium hyposulphite to the litre. The illuminating power of the light source to be tested was first read on the photometer in the ordinary way, and the cell containing the clear liquid was then interposed half-way between the source of light and the screen, and a second reading was taken, the difference between the two giving the light cut off by the cell and the liquid which it contained. ·05 grammes of hydrochloric acid per litre was then added to the liquid, and the solution was allowed to stand until the fine haze of sulphur particles which separated from the hyposulphite had finished forming, experiments showing that this took some time, but that, owing to the extremely fine state of division of the particles, the haze would remain constant, when once formed, over a very long period. When the haze had completely formed, another reading was taken, and from the three figures so obtained it was possible to deduce the amount of light absorption, due to the haze in the liquid, as apart from the absorption of the cell and the liquid which it contained.

Working in this way, with the greatest possible care, it was found that considerably less light was absorbed from the yellow coal-gas flame than from the whiter acetylene flame, whilst the absorption of the greenish-blue light of the Welsbach mantle was very great indeed, as is shown by the following table:—

PERCENTAGE LOSS OF LIGHT FROM VARIOUS ILLUMINANTS IN PASSING THROUGH ARTIFICIAL FOG SOLUTION.

Coal-gas flames	11·1,
Acetylene flames	14·7,
Welsbach mantle	20·8,

which means the acetylene suffers to the extent of 32 per cent., and the Welsbach burner loses 87·3 per cent. more of its light-giving power than our old friend the gas flame.

In all methods for obtaining light, the great test for the efficiency of the process is, after all, the percentage of the energy employed which is transformed into light, and we find that the amount so utilised is extremely small in all our artifical illuminants.

PERCENTAGE OF ENERGY TRANSFORMED INTO

	Heat.	Light.
Candles	98	2
Oil lamps	98	2
Coal gas—		
Flat flame and Argand	98	2
Regenerative	93	6
Incandescent	88	12
Electric light—		
Geissler tubes	97	3
Arc	90	10
Incandescent	95	5
Magnesium light	85	15
Sunlight	70	30
Glowworms, fire flies, and luminous beetles	1	99

It is evident, therefore, that, great as has been the advance made by the incandescent mantle over all other methods of consuming coal gas, there is still an immense field open for further improvements, and our present incandescent mantles might easily be surpassed in their power of emissivity.

PROFESSOR VIVIAN B. LEWES.

* Concluded from page 26.

THE SIMILARITY OF BICHROMATED GELATINE TO GELATINO-BROMIDE OF SILVER.

[Autotype Notes.]

IT may appear strange to many to claim for the gelatino-bromide of silver process any similarity with, say, the carbon process, seeing that the two processes are so widely different in all their details, as well as the results they yield, both in appearance and in stability. Still there is, as I shall presently point out, a great similarity in the two processes—under certain conditions.

Gelatino-bromide of silver, after exposure to light, if developed with pyrogallic acid, becomes very like in its behaviour to exposed bichromated gelatine. For example, both absorb water, and swell up where the light has *not* acted, and, in proportion as it has acted, an image, more or less,

in intaglio remains. With either, sufficient relief may be obtained to be moulded from for the production of printing surfaces. Further, with both the relief can be increased by the application of a little heat.

One of the earlier methods of producing printing blocks was, by what is called the "swelled gelatine" process. It is this: A glass plate is coated with bichromated gelatine, and exposed behind a negative, through a ruled screen, and then put to soak in cold water. In a very short time enough relief is obtained to get a cast from in any plastic material, such as plaster of Paris, from which an electrotype is taken. Some years ago, Mr. J. W. Swan, the inventor of the present system of carbon printing, patented a gelatino-bromide of silver process of producing printing blocks, which is analogous to the swelled method with bichromated gelatine. The process is this: A gelatino-bromide plate is exposed in the camera through a ruled screen, and developed with pyrogallic acid in the ordinary way. It then shows a certain degree of relief; but, as this relief is too small, it is further increased by the application of heat; either the plate is placed in warm water, 90° or so, or it may be laid on warm iron plate until enough relief is secured. From this a plaster of Paris cast is taken, as in the case of the swelled bichromated gelatine, which is afterwards electrotyped.

It may be mentioned that, after Mr. Swan's patent for this method of making printing blocks had lapsed, it was reinvented, repatented, and a syndicate formed to purchase the patent and exploit the process.

It will now be seen that there is a great resemblance in the characteristics of bichromated gelatine and gelatino-bromide of silver, although I have only alluded to their swelling properties in cold water; by a warm-water treatment the similarity is still greater. A bromide print, developed by pyrogallic acid, can afterwards be further developed in warm water in precisely the same way that a piece of exposed carbon tissue is treated, and, by this means, an image obtained in darkened silver and gelatine instead of the usual pigments and gelatine. The light's action is to render the gelatine insoluble in both processes.

This property was discovered by Mr. Warnerke some dozen or more years ago. The method, which he patented—patent since lapsed—is this: Paper is coated with gelatino-bromide of silver. After exposure, which may either be made in the camera or by contact printing, the image is developed by pyrogallic acid. When fully developed and washed, the picture is squeegeed on to a glass plate or on to a flexible support. It is then put under pressure, just as if it were a carbon print; after ten minutes or a quarter of an hour, it is put into warm water, when the paper support will come away precisely as does the back of carbon tissue. The soluble portions of the gelatine are then washed away, taking the unaltered bromide of silver with it. We have now the image in relief, the high lights being quite free from gelatine, as in a carbon picture, and the shadows formed of varying thicknesses of gelatine holding darkened bromide of silver instead of the usual pigments. The bromide picture can be fixed either before or after the second development. If the picture is on glass, and it requires intensification, any of the intensifiers used for carbon transparencies may be used—silver and pyro, or permanganate of potash, for example. As the high lights are free from gelatine, there is, of course, nothing in them to stain.

This process of Warnerke's appears to be quite unknown to most of the younger photographers, and almost forgotten by many of the older ones. Still it is a very interesting process. The inventor at the time was, not unnaturally, sanguine of its value, and it, no doubt, would have proved of commercial importance were it not for the trouble involved in its working. It not only necessitates proficiency in working the bromide process, but a thorough knowledge of the manipulation in the carbon process as well; while, of course, the risk of failures is more than doubled without corresponding advantages.

It may be as well to point out, should any of my readers desire to experiment with this very interesting process, that the gelatino-bromide of silver must be free from alum, and that the paper must be much more thickly coated with emulsion than is the ordinary bromide paper of commerce. The same remark also applies to the coating on the plates for Swan's process of making reliefs.

It will now be seen that there is a greater analogy between bichromated gelatine and gelatino-bromide of silver than many appear to be aware of who have not considered the subject.

E. W. Foxlee.

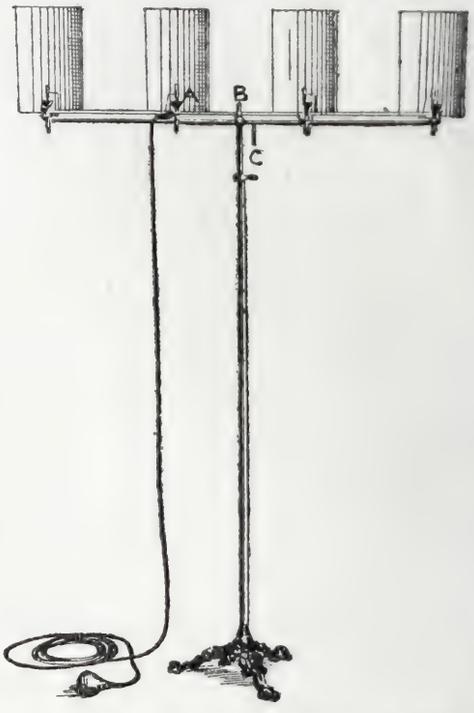
Our Editorial Table.

Maloni's Flashlight Apparatus.

G. Houghton & Son, 89, High Holborn, W.C.

The principle availed of in this system of making flashlight exposures is somewhat of a novelty. In the small cups shown on the cross rod, charges of a mixture of magnesium and a potash salt are placed, and ignition is effected by squeeging the pneumatic ball, which actuates a series of wires that have been heated in Bunsen flames. An exposure of about a fiftieth of a second is thus obtainable. Mr. Maloni has shown us a series of photographs, portraits, interiors, groups, &c., made by means of this light, which are exceedingly good. We append the instructions for using the apparatus:—

Fix up the apparatus as shown in illustration, attach the large rubber tube to C, and to an ordinary gas bracket, after first removing



the burner. There must be a full pressure of gas, and sufficient supply to give a full-size flame to the four Bray burners; also to make the four Bunsen flames touch and heat the forked wires to whiteness. The igniting wires are correctly adjusted before sending out the machines, and their exact position when down in the cups should be carefully noted, as a guide when fixing in new ones.

The four lights should flash exactly together, and to cause this the four forks must all enter the cups simultaneously, but must not go within one-eighth of an inch of the bottom of the cups.

To make the exposure, place the powder in the cups—the quantity depends upon the amount of light required — about half full is enough for sitting figures (for full-length and groups use more), using plates of medium speed, with pyro-soda development, and lens aperture about *f*-8. Before charging the cups, press down the lever at A till it is caught and held in place by the spring catch. Then, when ready to expose, uncap the lens and press the pneumatic ball, which may, for convenience, be hung on the camera stand. Owing to the amount of light given for the small amount of powder, there is comparatively little smoke, so that the apparatus can be used conveniently in a small room or studio if there is a small ventilation. The apparatus may be seen and tested at Messrs. Houghton's.

Deutscher Photographen Kalender.

Deutsche Photographen Zeitung, Weimar.

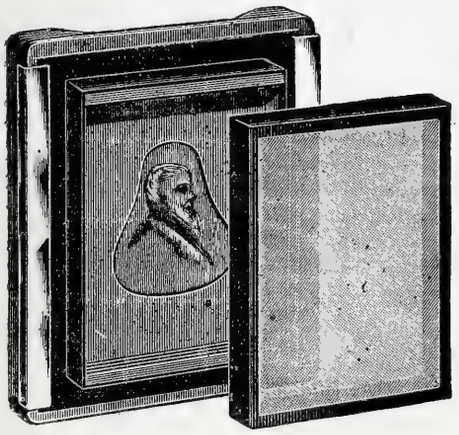
This handly little volume is well worth the attention of Englishmen travelling in Germany. In addition to a large number of tables and other useful information, it contains a list of the German and Austrian Photographic Societies, with the names and addresses of the members. There is also a list of available dark rooms in many of the principal Continental towns. A supplement gives a very comprehensive list of formulæ and receipts. The list of officers of English photographic societies requires revision, and is far from being up to date. The idiosyncrasies of English weights and measures also require some attention. We find a scruple given as ten grains.

Salmon's Adjustable Vignetter.

A. Salmon & Son, 169, Hampstead-road, N.W.

Utility and efficiency are the characteristics of this extremely handy Vignetter. Two thin metals strips are screwed on to the printing frame and a light grooved frame, for holding the vignetting cards and the diffuser, readily slips into the grooves. The vignetting cards can be easily changed, inclined at an angle or at a fixed distance

from the negative. The vignetter is useful for silver or bromide vignettes, and is excellent for printing from thin negatives when vignettes are not required, using the light diffuser only and without

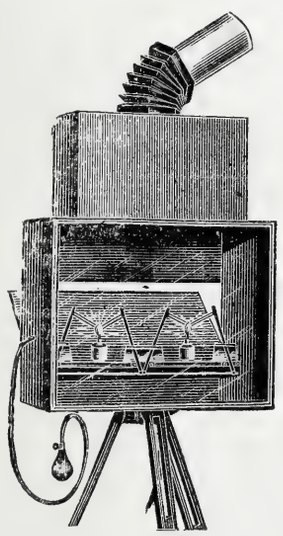


the vignetting card. The vignetter may be used in connexion with any ordinary printing frame, and does not interfere with the general use. We can recommend this vignetter to professional photographers as an exceedingly useful adjunct to the printing outfit.

Salmon's Portable Magnesium Lamp.

A. Salmon & Son, 169, Hampstead-road, N.W.

The principle availed of in this lamp, which is glazed with corrugated glass, is the ignition, by pneumatic means, of strips of magnesium supported on metal arms. The lamp is noiseless, and all the smoke and smell produced by combustion of the magnesium is conducted away through any available outlet in the studio by a portable telescopic chimney, which can be inclined



in any direction. The lamp shuts up in cabinet form when not in use, the chimney packing with the stand. The lamp is capable of giving a series of powerful lights, each of several seconds' duration, or the whole series can be fired simultaneously, and thus a very short exposure may be obtained. We have examined the lamp and seen it in operation; for portrait or group work, it should prove highly effective in the professional studio.

Pictorial Photographs: A Record of the Photographic Salon of 1896.

By W. L. Colls. London: Kegan Paul, Trubner, & Co.

For the second, if not the third time, Mr. Walter Colls has brought out an album of photogravures, made from photographs shown at the Exhibition of the Photographic Salon. On the present occasion eighteen photographs have been selected for reproduction, among them being Demachy's *Profile*, Maskell's *A Dutch Girl*, Vanderweyde's *Portrait of Lord Leighton*, E. R. Ashton's *Evening near the Pyramids* (probably the best of the reproductions), Paul Bergon's *The Model*, Calland's *The Mall*, &c. Some that we have not named might well have been omitted, and better works substituted, but we suppose Mr. Colls did not have a free choice in the matter. Still, if scarcely representative of the best work of the Salon, these eighteen photographs are wonderfully good and interesting. With characteristic skill Mr. Colls has succeeded in giving to his reproductions the effects of the salient properties by which the original printing processes are distinguished; these including platinum, bichromated gum, Artigue, and ordinary carbon. Taken as it stands, we have nothing but praise for this beautiful album of pictorial photographs. It should form part of the collection of every lover and student of pictorial photography. Mr. Colls has wisely eschewed *outré* subjects, and therefore deserves universal gratitude for the taste, skill, and distinction with which he has invested his excellent album.

News and Notes.

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, January 19, at 12, Hanover-square, at eight p.m. *The History of the Half-tone Dot*, by Mr. W. Gamble.

Photographic Club (Anderton's Hotel, Fleet-street, E.C.).—On Wednesday evening next, January 20, Mr. Chapman Jones, F.I.C., F.C.S., will deliver an illustrated lecture on *Negative-making*.

Photographic Society of Ireland.—In the Open Class Competition in connexion with the Annual Exhibition, to be held February 8 to 13, gold, silver, and bronze medals will be awarded (the gold medal conditionally on there being at least one hundred entries). The entrance fee is 1*s.* for each picture, which may be of any size or subject produced by any process. Entries will be received not later than January 31. The Hon. Secretary is Mr. Victor E. Smyth, 35, Dawson-street, Dublin.

Sheerness Camera Club.—Mr. J. O. Flynn writes: "I thought you would like to have a brief account of a lecture given on the 5th inst. Mr. Millard, C.E., F.R.P.S., Sheerness, late of Portsmouth, lectured on *Life and Scenes in Malta*, and gave an account of the Knights of Malta, and the magnificent monuments they have bequeathed to us, illustrated by means of the optical lantern with 120 pictures (Mr. J. J. King-Salter (President) took the chair) in the Sheerness Co-operative Hall for the benefit of the Sheernees Camera Club. There was a large audience, and the lecture was much appreciated. Since Mr. Millard has taken up his abode here, he has done much for the advancement of the Club in its tender age."

Demeney's Chrono Photographer. — This apparatus for projecting animated photographs, to which we referred on December 18, is made by Messrs. Gaumont & Co., of 57, Rue St. Roch, Paris. It is claimed to have been patented in all countries before all other or similar instruments. The films it takes are 60 mm. wide (2⅜ inches), and have an area four times larger than that of films usually employed. The simplicity of the instrument is such that the most inexperienced can successfully work it. The films are not drawn from spool to spool by means of teeth, and are therefore not injured during use, while the system of winding up adopted so soon as the picture passes the aperture also saves the film from injury by dust, tearing, or burning. The oxyhydrogen and incandescent lights can be substituted for the electric arc with good results. Messrs. Gaumont are the sole licensees and makers of the apparatus

Physical Science a Hundred Years Ago.—If we try to sum up the position in 1796, we find that, though some advance had been made in theoretical mechanics and dynamics, there was very little knowledge about heat, light, electricity, or chemistry. It was known, for example, that, if sulphur, glass, or sealing-wax was rubbed, or bits of zinc and copper were immersed in salt and water, sparks and shocks could be got out of the arrangement; but up to 1800 the phenomena of electrolysis were wholly unknown, and not till even later were the magnetic properties of the current discovered. The "corpuscular" theory of light held its own till the early days of the nineteenth century, and "caloric" was still regarded as a sort of matter which could enter into chemical combinations, and could be squeezed out of bodies like water from a sponge. Chemistry, at the same time, was only just emerging from the disorder attending the dying struggles of the phlogistic doctrine, and even the Lavoisierian system, which had taken its place, was disfigured by many errors, which could only be rectified by a long series of experiments more exact than anything which had ever before been possible.—"W. A. T.," in *Nature*.

Copyright Violation in America.—Publishers of magazines have been having some more trouble from the copyright law, which some of them have unconsciously violated. The Miami Cycle Company sent electrotypes to various monthlies, said electrotypes being advertisements for the Miami Cycles. The advertisement varied, but contained pictures of well-known actresses riding this bicycle. The pictures were ingeniously contrived, the faces and part of the figures of the riders being from genuine photographs, made by Morrison, of Chicago, who had these photographs copyrighted when he issued them. Publishers, of course, would not criticise an electrotype sent in that was apparently so harmless and so conventional. Mr. Morrison, through the Photographers' Association, immediately started legal proceedings, and it has cost the magazines that inserted the advertisements considerable money. The manager of one of them stated that they had compromised for £200. The advertisement ran in the *Nickle Magazine*, *Munsey's*, and various others. Another instance of this came to the attention of publishers last winter, when the Ingram Interlining Company used a photograph of Cissy

Fitzgerald and her notorious wink, said photograph accompanying a testimonial. This photograph was copyrighted by Schloss, of New York, who immediately made trouble for the publishers who ran the advertisement, which eventually cost the publishers more money than they received for its insertion. With these two warnings it is not probable that a repetition will occur. The Photographers' Association is keenly on the alert, and through its lawyers wastes no time in asserting its rights.—*The Professional Photographer* (*Buffalo*).

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
18	Camera Club	*Pompeii.* Noel Cox.
18	Ealing	*Printing Surfaces.* Discussion opened by R. Whiting.
18	Richmond	*Printing and Toning Chloride Papers.* J. D. Gibson.
18	Southland	Rural Scenes
18	South London	*Venice and Lucerne.* W. F. Fenton-Jones.
18	Stafford Y.M.C.A.	*Hand Cameras and Shutters.* Mr. Kirkham.
19	Birmingham Photo. Society	*Enlarging.* John A. Hodges, F.R.P.S.
19	Brixton and Clapham	Eighth Annual General Meeting.
19	Gospel Oak	Lecture: *Pictorial Composition.*
19	Hackney	*At the Leeds Convention.* Mrs. C. Weed Ward.
19	Halifax Camera Club	*Normandy and Brittany.* W. J. Warren.
19	Isle of Thanet	*Printing and Toning.* E. Baily.
19	Leeds Photo. Society	Social Evening and President's Address.
19	Lewisham	The Treatment of Figures.
19	Royal Photographic Society	*The History of the Half-tone Dot.* W. Gamble.
20	Borough Polytechnic	Bromide Enlargements.
20	Leeds Camera Club	Beginners' Lecture. V. *Portraiture and Grouping.* C. C. Vevers.
20	Leytonstone	Practical Demonstration on Acetylene Gas. H. Snowden Ward.
20	Photographic Club	*Negative-making.* Chapman Jones.
20	Southport	*Pictorial Photography.* A. Horsley Hinton.
21	Camera Club	*Ely Cathedral, and Woodland Studies.* Frederick H. Evans.
21	Leigh	Competition: Enlargement.
21	London and Provincial	*London by Gaslight* Paul Martin.
21	Nottingham	*Enlarging.* J. A. Hodges, F.R.P.S.
21	Oldham	*A Chat about Enlargements.* J. W. Cooper.
21	Putney	*Hand-camera Work.* W. Thomas.—Show of Hand Cameras by Members.
21	West Surrey	*Carbon Printing.* G. H. James.
21	Woodford	*Architectural Photography.* H. W. Bennett.
22	Rotherham	Members' Competition Closes.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 12,—Ordinary Meeting,—Mr. J. Spiller in the chair.

THE AFFILIATION SCHEME.

The CHAIRMAN called attention to the fact that fourteen societies—several of them being of recognised importance—had been admitted to affiliation since the last meeting.

THE PROGRESS MEDAL.

The CHAIRMAN announced that the Progress Medal of the Society had been awarded to M. Gabriel Lippmann, for his discovery with regard to the production of photographs in natural colours by the interference method.

SCRUTINEERS.

The following members were elected to act as Scrutineers at the forthcoming election of Council and officers:—Messrs. Atkinson, H. W. Bennett, Bullen, C. H. Oakden, Rapson, Tottem, C. F. Townsend, and H. Snowden Ward.

RADIOGRAPHY UP TO DATE.

Dr. HALL-EDWARDS, L.R.C.P., read a paper entitled *Photography by the Röntgen Rays up to Date.* From the point of view of the ordinary photographer, he said it must be admitted that the results of experiments had, up to the present, been disappointing. He had hoped that the X rays would throw some light on the vexed question of the formation of the latent image; but, although he had amply proved that their action was identical in every respect with that of light, he was afraid the solution of the problem was as far off as ever. During the progress of the early experiments, it had been said that the photographic action of the rays was due to the fluorescence of the support upon which the sensitive film rested, and, as evidence of this, it was stated that the exposed films developed from the back, and that no image could be developed upon a film which was not backed by a fluorescent medium. This statement, however, was easily disproved, for the plates did not develop from the back, and negatives could with ease be produced upon films which were not supported upon any visible fluorescent substance. He was of opinion that, for securing the best results, thickness of film was of greater importance than rapidity. The rays emitted from different tubes varied so much in their penetrative power that some method of measuring them was a necessity, and for this purpose a rayometer might be used, or the protecting cover of the plate might be ruled across with lines at a given distance apart, and, the length of spark and the distance between tube and plate being carefully noted, a thick piece of sheet lead with a straight edge should be placed over the plate so as to protect all but the first marked-off division, and, this having been exposed to the rays, the edge of the lead should be removed to the second and successive lines on the covering, and the same exposure repeated for each division, an examination of the plate after development showing which section had received the correct exposure. For medical work he had not found any advantage to accrue from the special plates lately put upon the market. At the same time, the effect of the X rays upon fluorescent screens led him to think that extended investigation would ultimately render possible the production of a plate far more sensitive than any at present available. Unfortunately the most fluorescent salts were also the most opaque, platinocyanide of barium and tungstate of calcium being two of the most opaque salts we had yet experimented with. With regard to developers, the Ilford pyro soda formula and the hydroquinone developer of Thomas had, in his hands, produced the best results. There was still plenty of room for improvement in tubes, Watson's "Penetrator" tube being a distinct advance in many respects. He at one time imagined that the intensity of the X rays was in direct ratio to the number of breakers made by the contact breakers, and he now found that a certain but variable number yielded the best results, the number varying with the state of the tube, that best suited for the purpose being determined by the amount of fluorescence. It was a well-recognised fact that variations in thickness could be radiographed; or, further, if a sheet of metal were dented ever so slightly, as not to render one part thinner than another, the indentation could be pictured. In illustration of this fact, he showed a radiograph of the metal cover of a pyro bottle, the lettering and trade mark standing out as plainly as if photographed with a camera and lens, and he attributed the production of the image to the varying distances of the surfaces of the pressed metal from the photographic plate. The paper concluded by summarising the various theories put forward to account for the X-ray phenomena, including the electrical, the fluorescent, and the ultra-violet light, and by the statement that, as a matter of fact, we were still perfectly ignorant upon the subject.

Mr. A. W. ISENTHAL, referring to the statement as to the opacity of platinocyanide of barium, said he had been able, with only comparatively small electrical energy, to obtain a distinct shadow on four screens, placed one behind the other, with a distance of eight inches between them, and he therefore did not regard that substance as opaque. With regard to the fluorescence of a tube being taken as a criterion of the amount of X-rays to be obtained from it, he had found that tubes which had fluoresced excellently, and with which he had seen some of the deep-seated structures of the body, had been quite useless for obtaining satisfactory results on a photographic plate.

Mr. WILSON NOBLE said it was impossible for a fluorescent screen to be transparent, because a screen, to be fluorescent, must of necessity retard the rays in order to produce fluorescence. There were great differences in the behaviour of tubes, and in the behaviour of a particular tube at different times. So far as he was able to judge, when a tube gave a sort of ground-glass fluorescence, the effect was to make the bones much more transparent than when the fluorescence was of an apple-green colour.

Mr. W. E. DEBENHAM suggested that the fact that the possibility of representing the trade mark, &c., on the covering of a pyro bottle might be due to the fact that the bent or raised parts of the metal were more at right angles to the line of light than other parts, and that the rays had practically to penetrate a greater thickness. He did not agree as to the necessity for a dense deposit on the negative, because it was very easy to intensify.

After further discussion,

Dr. HALL-EDWARDS said that, in referring to the opacity of platino-cyanide of barium, he was thinking more of photographing through such substances than of using them as fluorescent screens, and he doubted very much whether the best tube for photographic purposes was the best for seeing with a screen.

DICHROIC GLASS.

Mr. T. BOLAS exhibited several specimens of dichroic glass, the colours of which changed with the conditions under which they were viewed, a single thickness of one sample, viewed by transmitted light, appearing green, while two thicknesses were bright red. Similar peculiarities were possessed by other glasses, and the exhibits were examined with much interest.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 7,—Mr. W. E. Debenham in the chair.

Mr. A. HADDON said that he had made some experiments with a portion of the bromide enlargement shown by Mr. Wall at the last meeting, when it was suggested that the darkened high lights were due to imperfect fixation. He, however, denied the existence of any silver in the high lights. He had tried, without success, to get an image on a piece of the print after treating it to that end, and had burnt another piece, and tested the ash for the presence of silver, also without any result, so that the action could not be due to incomplete fixation. He was led to believe, however, by a further experiment, that the print had been toned with gold, and therein lay the cause of the stain in the gelatine.

Mr. HOWARD FARMER read a paper on

THE INFLUENCE OF DISTANCE ON EXPOSURE.

Mr. P. EVERITT was inclined to think that, although taken individually, there might be a great deal of truth in the different items raised by Mr. Farmer, taken collectively, and harking back to experience, it was a question whether, in ordinary work, such as landscape, so much importance need be given to these items. A dry plate would stand two or three times the amount of a normal exposure without a marked alteration in the result; in fact, he was rather inclined to err on the side of over-exposure than to cut down the exposure to such an extent that one got the bare effect that was wanted. He had not heard any mention of the question of lens in relation to exposure, and he was of opinion that account should be taken of that as well. Another point that had not received much attention was the thickness of the lens. He considered that, in actual practice, owing to the latitude afforded by a dry plate, one could almost disregard these points.

Mr. MILNER said there was another point he had not heard touched upon, which had a great influence on exposure in relation to distance, and that was the amount of atmosphere you photograph through. That and the character of the subject to be photographed were, he thought, the two biggest points in connexion with the matter under discussion. For instance, looking through a mile of atmosphere, shadows appeared almost like high light, and the exposure in photographing 100 lines to the inch would differ very much from that in photographing a similar subject with black spaces of half an inch wide.

Mr. EVERITT, adverting to his remarks on the thickness of the lens, thought the glass used in its construction should also be considered.

The CHAIRMAN thought it a mistake that, in a previous paper, distance should be put down as a definite factor with a definite proportion. He took it that distance and size in themselves were not to be considered as factors. There were circumstances accompanying both which very much affected exposure; but, considering that these factors varied so much under different circumstances, it was quite impossible to give them definite value. There were two or three reasons, rather independent of distance itself, which would account for difference in exposure. Taking the illustration mentioned—that of trees at certain distances—as one drew nearer to the tree, one got to see more of the under side of the branches, &c., which were the darker parts, and naturally should give more exposure in order to give these some value. He agreed with Mr. Milner regarding atmosphere as a factor. Regarding the statement that in photographing distant objects one made use of mainly the surface reflections—the white light reflected from the object—whereas with the near objects the internal reflections which took on the colour of the object itself were used, he asked, Was there any reason why, if at ten yards from any particular object one got, say, fifty per cent. of surface reflections and fifty per cent. of internal reflections, at fifty yards anything different should be the case? If so, there must be some laws of the propagation of waves of light which he thought were not generally known. If the light of the surface reflections proceeding from any object did not decrease with the square of the distance, and that from the internal reflections did, he should like to hear it explained. As regards the effect of open sunlight, which made roads and other white objects appear too white, he did not think it was a fact now, and there were many photographs in which, personally, he should prefer to see a little more sunshine. The method of remedying it seemed to be to use double-coated plates (on which he had seen most charming representations), or by backing the plate well, and giving a sufficiently long exposure for the shadows. Mr. Farmer had explained the difference in exposure by the statement that the surface reflections were used in the case of distant objects, and the internal reflections with near objects. If so, a red house at a distance should come out like a white house, on account of the surface reflections only being used.

Mr. EVERITT, after some discussion on the question of internal and surface reflections, said he had found that the use of a screen with an orthochromatic plate made a difference with regard to the atmosphere in landscape, seeming to eliminate it. His attention was first drawn to this by Mr. Wellington, who said that the best way to get rid of fog or atmosphere from a picture was by the use of a yellow screen with an orthochromatic plate.

Mr. FARMER briefly replied. In reply to Mr. Everitt, his whole experience told him that, if there was one thing to aim at, it was correct exposure for the effect required. He thought some estimate of the value of distance was of great importance, but the point seemed to be disregarded altogether. He also went further into the question of internal and surface reflections.

A hearty vote of thanks was accorded to Mr. Howard Farmer.

PHOTOGRAPHIC CLUB.

JANUARY 6,—Mr. Edward Crofton in the chair,—Trade Night.

Mr. ARTHUR SALMON, on behalf of Messrs. Salmon & Son, of 169, Hampstead-road, London, showed a newly invented vignetting frame, which appeared to be of a very practical and workable design. It is suitable for vignetting in any shape by any of the well-known printing methods, such as bromide, P.O.P., &c. It can be fitted to existing printing frames by screwing two aluminium angle pieces to the wooden sides of the frame. This device enables a cardboard box to slide into position, and avoids the necessity of sticking or pinning the vignette mask to the frame. The cardboard box is provided at each end with a series of grooves, into which a neatly shaped cardboard vignette can be fitted. It is so arranged that the vignetting mask can be adjusted into any position, and a soft shading of the print is ensured by the power of increasing the distance of the mask from the negative. Provision is made for attaching a diffusing screen, which may be of tissue paper or muslin, to the top of the box. With the apparatus (which costs 2*s.* for a quarter-plate, 2*s.* 6*d.* for a half-plate, and 3*s.* 6*d.* for a whole-plate size) is supplied a series of neatly cut masks of variously shaped apertures. It was generally agreed that the device was of a very useful character, and was the most convenient frame for the purpose which had come under the members' notice.

The same exhibitor showed Salmon's new portable magnesium ribbon lamp for portraiture, for which he claims freedom from noise, danger, smoke, and smell. The products of combustion are carried away through an ingeniously portable, cardboard, telescopic chimney, which can be inclined in any direction. The whole is contained in a portable wooden cabinet. The method of igniting the strands of magnesium wire—ten of which are bound together so as to burn simultaneously—is by a series of arms actuated by pneumatic means, and which, by pressure upon a rubber ball, insert the ends of the combined strands of wire into the flame of a spirit lamp. Two or four strands of wire, as may be desired, can be ignited at one time. The light is diffused by means of a piece of rolled or corrugated glass. The lamp was shown in action, and gave a strong light for five to eight seconds, which the exhibitor said was sufficient to make satisfactory exposures. Photographic examples, both of the results obtained by means of the lamp and the vignetting frame, were shown. Mr. Salmon was heartily thanked for an interesting aed useful exhibit.

Mr. MALONI, a photographer, of 29, Newmarket-street, Ayr, N.B., described and demonstrated Maloni's patent

FLASHLIGHT FOR PORTRAIT PHOTOGRAPHY.

Describing his apparatus, the exhibitor stated that one of the prime difficulties to be overcome in making portraits by flashlight apparatus is a blinking effect upon the eyelids of the sitter, which often obtains when the duration of the flash is long enough to produce a good exposure. With his apparatus the flash is absolutely intantaneous—not exceeding the one-fiftieth part of a second—and consequently the exposure of the plate is consummated before the subject can make any movement. He uses a mixture of magnesium powder and a salt of potassium, the latter supplying the oxygen necessary for very rapid combustion. It is not chlorate of potassium. He claims that his mixture is absolutely safe under all ordinary circumstances. It will not ignite if blown through a Bunsen flame. His method of ignition is to heat wires in an atmospheric gas flame to a white heat. The mechanical arrangements of his instrument dip four of such wires into four cups, each containing a little of the powder. The contact of the heated wires with the magnesium must be absolutely synchronous. A sheet of parchment paper is interposed between each section of the lamp and the subject to be photographed. Four gas jets provide sufficient light to focus the image, and give the necessary indication of the lighting of the subject. The apparatus, which costs 6*l.* 10*s.*, is capable of illuminating any number of sitters up to twenty, and will practically fill a studio of ordinary size with light. The cost of the magnesium mixture is 1*s.* 6*d.* per ounce, which is sufficient for forty full exposures.

Mr. Maloni was asked a number of questions, the answers to which are incorporated in the preceding description. Subsequently he photographed two members of the Club, and the results are expected to be shown at the next meeting. Mr. Maloni was cordially thanked for his interesting explanation and demonstration.

Brixton and Clapham Camera Club.—January 5, Mr. J. W. Coade in the chair.—A paper, one of the series arranged by the Affiliation, on

ARCHITECTURAL PHOTOGRAPHY,

was read by the author, Mr. H. W. BENNETT, F.R.P.S. The paper was of a thoroughly practical nature, well illustrated with lantern diagrams, and dealing exhaustively with every detail, such as choice of camera and lenses, best plates to use, precautions against halation, time of exposure, &c., the whole being most carefully considered and clearly explained. Some choice slides of cathedral interiors and other architectural subjects were also shown by Mr. Bennett, who finally answered a volley of questions from various members. The number of entries being very small, no medal was awarded in the recent members' quarterly competition, which, on this occasion, was for the best print on bromide paper. Mr. J. W. Grubb was considered by the Judges to have contributed the best work, and received a certificate accordingly. The Annual General Meeting will be held Tuesday, January 19.

Hackney Photographic Society.—January 5, Mr. A. Barker presiding.—Mr. H. STUART read a paper on

ENLARGED PAPER NEGATIVES,

and showed a number of examples of work done in this way. Briefly, the process consisted in taking a direct print from the original small negative, and then making from the small print an enlarged negative on bromide paper by copying in the enlarging camera. Mr. Stuart said that the use of paper for negative-making was an old idea, but his method differed from the older ones in that the image was kept on the surface of the paper instead of being in the fibre of it. In his experiments he had used different kinds of printing papers for the original small print, and had found that, to preserve detail, P.O.P. or smooth surface bromide paper squeegeed to glass, answered the best. The print should be copied from whilst in contact with the glass. For the enlarged negative slow, smooth bromide paper was best. The exposure must be gauged by means of an actinometer. Hydroquinone was the best developer for the purpose in question, as it corrected the tendency of the bromide paper towards flatness. The enlarged negative might be waxed or used as it was. As waxing was a rather troublesome process, and in the lecturer's opinion sufficient detail could be obtained without it, he thought that it might be dispensed with. The enlarged positive might be on any kind of printing paper that might be deemed suitable, but, whether on bromide, platinum, carbon, &c., it should be of rough surface. In this connexion, however, it may be remarked, that among the sample prints shown at the meeting the one most admired was matt solio paper. The absence of grain in the paper itself was compensated for by a small amount of grain transmitted by the paper negative, the effectiveness of the result being enhanced thereby. Mr. Stuart thought that, when enlarging direct from a positive transparency, more detail was preserved than by the enlarged paper negative method; but he was of opinion that quite sufficient detail was preserved by the latter method, which had several important advantages, one being cheapness, another the ease with which retouching, working up, and combination printing could be done.

Leytonstone Camera Club.—January 6, the President (Dr. Turner) in the chair.—Mr. C. A. RUSSELL gave a lecturette and demonstration on

LANTERN-SLIDE MAKING BY REDUCTION AND PRINTING-OUT PLATES.

Having explained the principle of reduction of the negative to lantern slides with the ordinary camera, and an ingenious idea of his own for taking any size negative, he next proceeded to make an exposure by means of magnesium ribbon. Having placed a piece of ground glass in front of the negative, he advocated watching the illumination given by the ribbon from the film side of the negative, which enabled him to treat any dense portions of the negative to a longer or more intense exposure. He found, reducing half-plate to lantern size, two pieces of ribbon, about six inches long, being about correct to give the necessary exposure for a good negative. Varying exposures, and treatment with bromide and carbonate of ammonia with a hydroquinone developer, were shown for various tones, which were duly developed and passed round, showing very good results had been obtained. The latter part of his lecture, dealing with the well-known Pazet print-out lantern plates, was gone into. Printing frames were passed round, containing the plates printed and ready for development and toning. He recommended printing deeply until the high lights in the negative were beginning to discolour in the lantern plate, and

he results obtained by these plates in the variety of tones, and their beautiful transparency, left little to be desired for a perfect slide; in fact, everybody being desirous of giving them a trial, the examples kindly sent down by the Paget Company of their three kinds of lantern plates, everybody was anxious for print-outs, which would not go half round a well-attended meeting.

Polytechnic Photographic Society.—January 10.—Owing to the Exhibition of Members' Work, the ordinary meeting was not held last week. The Committee thank those members who sent in their work at such short notice, and also those who draped and hung the frames. The exhibits showed technical as well as artistic skill, and it would be difficult to say which was the best. There being no prizes makes the matter easy to settle by mentioning no names. The night of meeting is now Thursday in place of Wednesday. January 21, Open Night.

Putney Photographic Society.—January 4, Mr. J. A. Hodges, F.R.P.S. (Vice-President) in the chair.—The Royal Photographic Society's lecture, by Mr. Horsley Hinton, on

PICTORIAL PHOTOGRAPHY,

was, in the absence of the author, read by the Chairman, and was greatly appreciated by the members present. Some very good slides by members of the North Middlesex Society were afterwards shown.

South London Photographic Society.—January 4, the President (Mr. F. W. Edwards, F.R.P.S.) in the chair.—Mr. H. STUART (North Middlesex Photographic Society) gave a lecture on the making of

ENLARGED PAPER NEGATIVES.

In opening, the lecturer gave a sketch of the early use of paper for the making of negatives, which substance was considered wanting in some respects and discarded after some time. In those days most of the image was in the fibre of the paper, but in the negatives he showed it was on the surface. The system which he had adopted for enlarging differed from the ordinary procedure, inasmuch as the negatives were produced with reflected instead of transmitted light, no transparency being used. A print from a quarter negative plate on silver, gelatino-chloride, or bromide paper, was squeegeed on to a piece of good glass, and this was photographed up to the required size in ordinary bromide paper. He found the exposure for enlarging on this paper from quarter-plate up to 10×8, using *f*-16, varies from about fifteen minutes on summer to three hours in winter. To gauge the necessary exposure, he always used an actinometer, a home-made, one of twenty-nine tints, but one of a dozen tints would be sufficient if the first tint was made of three thicknesses of tissue paper. Focussing required care, and it would be found that a good focus, could not be obtained on the ordinary ground glass, and for this he substituted a piece of ordinary clear glass. The focussing was done with an eyepiece, care being taken to get the focus on the inner surface of the glass. With an enlarging camera, such as Lancaster's, the point of focus having been once ascertained, can be marked for future use for different sized negatives, *i.e.*, 10×8, 12×10, and 15×12. The advantages of making paper negatives were that prints from them by any process can be made, and for carbon work they can be printed from either side. If rough paper was used for the final point, there would be no indication of grain. Retouching could be done on either or both sides with greater ease than upon glass, and no preparation of the surface was necessary. It was doubtful whether waxing the negatives was advantageous.

Birmingham Photographic Society.—The following are extracts from the report for the year 1896: In presenting the Twelfth Annual Report, your Council is again in a position to speak favourably of the progress made during the year. The Society has become well established in its new quarters, and is reaping the benefits of having permanent rooms, which are always available for small exhibitions, meetings, and the various objects of its existence. The advantages of such a convenience have been demonstrated by the exhibits of individual work which your Council has been enabled to place before members, notably the admirable display of pictures by our President, Sir J. Benjamin Stone, of the Transvaal and South Africa, in February, and of his unique collection illustrating the treasures of Westminster Abbey, in November. The pictures in each case were on view to members and friends for two or three weeks. Upon the second occasion our President instituted a truly social evening by the invitation of ladies, and the generous distribution of light refreshments. The attractive series of large direct photographs by Mr. W. Topham remained on the screens for a considerable time, and a miscellaneous collection by several members is still hung in the room. To facilitate the ready hanging of such pictures, your Council has had a couple of exhibition screens fixed in the lecture room, and hopes that members will avail themselves of the opportunity thus afforded to give a greater number of "one man exhibitions." The papers and demonstrations have covered a wider range of subjects than usual in practical and theoretical photography, while the general tendency to the artistic element prevailing amongst the more advanced workers has not been neglected. The sociability of the Society has been still further promoted by a new departure in Open Evenings, namely, a *conversazione*. This was held in the Grosvenor Rooms, at the Grand Hotel, on February 18, when 175 members and friends took part in the dancing to the strains of Mr. Alfred Gregory's band. The universally expressed enjoyment of the occasion, together with its financial success, have been such as to induce your Council to make arrangements for a similar evening in January, 1897. In response to a request for a donation to a fund for the promotion of a lectureship in connexion with photography in London and the provinces in memory of the late J. Traill Taylor, Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, your Council voted a sum of two guineas. Twenty-six new members have been enrolled during the year. The finances of the Society continue in a sound condition, and show that, without including the handsome profits resulting from the *conversazione* and Exhibition, the expenditure is well within the amount of the annual revenue. The annual Exhibition was again held in the Exchange Assembly Rooms, being opened on May 4 by Alderman F. C. Clayton, J.P. The screens were arranged in a zigzag manner around three sides of the room, the fourth side being occupied with stands for apparatus and appliances by some of the leading manufacturers and dealers of the country. This Exhibition was by far the largest and best ever held under the auspices of the Society, and may be said to have excelled anything of its kind in the Midlands. The total number of entries was 679, in addition to which about 230 photographs of objects of interest in the county of Warwick, produced by members of the Society for the Survey, were also displayed. In January the Warwickshire Survey Section was merged under the ordinary management of the Society. It had previously been carried on separately, with an additional subscription; but, although the Section made use of the Society's rooms, notice cards, programmes, &c., your Council had no control over it, and could not discuss any business in connexion therewith. The Survey being managed by practically the same individuals as the Society occasioned a number of meetings which might well have been dispensed with. Now, however, all arrangements can be made through the usual channels, and there is no necessity for a further subscription. The supreme authority on the Warwickshire Survey, however, rests with the Survey Council, a body originally constituted to consist of delegates from all the photographic, scientific, literary, and artistic societies in the county (to the extent of five per cent. of the number of their members), with the addition of co-optative members of individual influence. Most other societies displayed an indifference to the scheme, which was unfavourable to the formation of the Survey Council upon the delegate system, and, as the number of representatives of this Society (ten) was, for some unexplained reason, not kept up, the Survey Council has existed chiefly as a non-representative body of individuals, without rules or regulations. The very generally expressed desire of the workers of the Survey for a reconstruction of authority has resulted in the appointment of a Committee to draw up rules and by-laws for the proper management of the Survey, and it is hoped that the organization will be placed upon a thoroughly businesslike basis. In August, 345 pictures, contributed by members of the Society, were handed to the municipal authorities, a large selection from which was publicly exhibited at the City Art Gallery. The total number of photographs at the Reference Library is now 1825.

Leeds Camera Club.—Another of this Society's popular smoking concert was held in the Grand Restaurant on Wednesday evening, the 6th inst. A capital programme was provided. Messrs. Gaunt Palliser, Encell, Mortimer, Bedford, Parrott, Hankingson, Groxton, and Vernon gave excellent vocal selections; Messrs. Swinden and Stockwell's humorous recitations were highly appreciated; Profes or Walker's performance was a clever exhibition of the ventriloqual art, and Dr. Bourke's phonographic exhibition was one of the best items of the evening. Through the kindness of Mr. C. Weldon Messrs. Garrity and Gilligan, Murray and Maxwell, Fred Clyde, and the Swiss Mountaineers appeared from the Princess Palace, their "turns" receiving enthusiastic encores. Throughout the evening the ubiquitous Secretary Irwin was busy collecting subscriptions and refreshing the artists. Mr Vevers manipulated the hammer, and Professor Needham the piano.

Sheffield Photographic Society.—January 5, the President (Mr. G. Tomlinson) occupied the chair.—Mr. SPARHAM CAMP read a paper and gave a practical demonstration,

CONTACT PRINTING ON BROMIDE PAPER.

This paper, he pointed out, was very convenient for amateurs, as it required much less time, and the printing being done by artificial light enhanced its value considerably in such dull weather as we now experience. For this process he preferred a rather thin negative full of detail, but by varying the exposure and distance from the illuminant a good result can be obtained from any negative which will not yield a good print by any other process. The printing in of clouds, which is a stumbling-block to many amateurs, was carefully explained. Mr. Camp then exposed some paper, and clouds were printed in, and the result after development with hydroquinone was quite satisfactory, as were also a number of other prints which were exhibited. Sample packets of paper were distributed among the members for trial, and a hearty vote of thanks was accorded the demonstrator for his highly instructive and interesting demonstration.

Wolverhampton Photographic Society.—January 5, a series of

SLIDES OF THE COAST OF WESTERN CORNWALL

was exhibited at a meeting of members and friends of the Society, at the Blind Institute, by Mr. C. J. FOWLER, the Secretary of the Birmingham Photographic Society. The series consisted of views of the Cornish coast from Falmouth round the Land's End to St. Ives, including Penzance, the Lizard Head, Newlyn, Whitesand Bay, &c. Mr. Fowler gave an entertaining account of the various points of interest, the curious old-fashioned houses, the dress and ways of the fisher folk, the farms, and many striking examples of the rocky coast. The display appeared to be much appreciated by the audience, and a hearty vote of thanks was given to the lecturer at the close.

Edinburgh Photographic Society.—January 6, Mr. A. Eddington presiding.—A discussion on

PLATES

occupied the evening. Isochromatic plates were treated of by Dr. Scott Lauder, slow medium by Mr. J. M. Turnbull, and rapid instantaneous by Mr. F. P. Moffat. Dr. SCOTT LAUDER explained that he failed to detect any advantage in the use of isochromatic plates without a screen, unless the light happened to be very yellow, over the ordinary plate. To get the true value of the isochromatic plate a screen must be used. Snow scenes were much improved by the use of the isochromatic plate and screen. Mr. TURNBULL strongly advocated the use of slow plates wherever practicable. They allowed of far more latitude in exposure, and kept far better than fast plates. Fast plates were too often used for purposes which a slow plate would have performed better. Mr. MOFFAT held that rapid plates allowed of more latitude in exposure than many people imagined; the developer used had a great deal to do with the matter. For professional portrait photography the most rapid must be used, because the quicker a sitter was taken the better. For hand-camera work the most rapid plates should be used. Copies of the presentation print were distributed to the members. This session the Society's presentation print is a beautiful photogravure from a most artistic photograph by Mr. Tagliaferro, of Malta.

FORTHCOMING EXHIBITIONS.

1897.	
January	Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.
,, 15	Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.
February 1–27	Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.
,, 8–13	Photographic Society of Ireland. Hon. Secretary, Victor E. Smyth, 35, Dawson-street, Dublin.
,, 25–27	Woolwich Photographic Society. Hon. Secretary, F. W, Machen, 161, Griffin-road, Plumstead, S.E.
March 6–13	South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A FURTHER NOTE ON THE TANNING OF GELATINE.

To the EDITORS.

GENTLEMEN,—Some few weeks ago (November 27 last) I wrote on the subject of the tanning of gelatine films by the developer and other causes, and mentioned that a gelatino-chloride emulsion containing free silver, and even plain gelatine in the presence of free silver, were rendered insoluble by the action of light. I may now add a further experience.

At the time of writing that article I made a solution of Coignet's gelatine, to which, when dissolved, nitrate of silver was added to probably the extent of ten grains to the ounce, though I did not actually measure the quantity of solution used. This was set aside in the dark room for purposes of experiment, and forgotten until a day or two since, when it was found to have acquired the colour of ordinary glue. On placing the beaker in hot water, it refused to melt, even when boiled for some time, and the jelly, when scooped out and boiled with more water in a separate vessel, simply broke up into little pieces, without any signs of solution.

The portions that had dried into the beaker resisted not only two days' soaking, followed by boiling for some time, but also vigorous friction with Brookes's soap and sand, and required a knife and considerable force to remove them.

So that even the action of light does not appear to be necessary to produce the "tanning" action.—I am, yours, &c., W. B. BOLTON.

PETERBOROUGH CATHEDRAL.

To the EDITORS.

GENTLEMEN,—The writer of the note on "Peterborough Cathedral," in your issue of January 8, evidently has little knowledge of building operations, or he would not have so much faith in the possibility of taking an old building down and putting it up again. It is well known that hardly more than a tenth part of the stones, however carefully numbered, ever get back to their places; and those that do get back are so injured by removal, and so disfigured by numbering, that they have to be chiselled over; and then of what earthly value are they? a new stone would be just as good.

Your contributor is, apparently, credulous enough to put faith in such a promise (that of putting the stones back); he certainly must have forgotten the history of the rebuilding of the central tower at Peterborough.

What are the facts about the west front? It is admitted that it needs repair. Two fashionable "restorers" say parts must be pulled down and rebuilt. Five other architects, quite as competent, say it need not be pulled down, but can be repaired and made safe, so that the beauty that time has added to the glory of its design need not be injured.

The Society of Antiquaries and the Society for the Protection of Ancient Buildings cannot be accused of acrimony, for they have offered to submit their scheme to the arbitration of any independent authority, and have actually offered to defray the cost of carrying it out themselves; and for this munificent offer the societies have only received curt refusal. Are the Dean and Chapter afraid their scheme is unsound? or why are they in such undignified hurry? and why do they refuse to submit it to independent experts, instead of sheltering themselves behind the report of their two restoring architects?

If your contributor is a believer in "restoration," I would recommend him to study the north porch of Westminster Abbey, and to compare a photograph of the west front of St. Albans Abbey, as it was a few years ago, with its present condition, since it has been "grimpthorped."

HAROLD BAKER.

THE BEAUTIFUL IN ART.

To the EDITORS.

GENTLEMEN,—I have read with much attention your articles in THE BRITISH JOURNAL OF PHOTOGRAPHY, and have much profited by the explanations and instructions, given in your pages of chemical and manipulative remarks and explanations. But, varied as may be the cameras and processes for different plates, formulæ, and printing processes, so useful each in a different way, I am afraid we are in danger of leaning too much on them. I have often wondered why photographers do not use their pencils more; I was looking through, the other day, the National Gallery of painting, and also through the excellent antique sculpture at the South Kensington Museum, for there we have to those who can read it much of the source or inspiration of perfection, which mere looking at will not give. I read only the other day of a celebrated Academician who stated he had stared at the works of the Great Masters, and that is what I think many of us have done, and to what purpose?

But I am speaking to those chiefly whose years are still before them, for it is not a matter of what process, or plate, or camera, provided you produce a work of art, a portrait, or some work whose perfection shall bring beauty into the homes of your fellow-men, and will instruct as well as amuse by showing them better things. Why do not photographers learn to draw more, I do not mean to say just enough that they can say they can draw, or have gained a certificate or medal; but I mean that they should learn to draw well enough to make careful and good drawings of those incomparable works of art, that they should learn them by so doing, digest them in their minds, and apply the knowledge so obtained to every work passing through their hands—so tenderly, gently, unostentatiously, that the public does not see it, but feels it at every turn, and, what is more, pays for it. I could say more, Mr. Editor, but I am afraid of wearying you; but, as a great artist said once, there are forms that should be sought for, wrought for, and fought for.—I am, yours, &c.,

J. BOOL.

INSTRUCTION IN PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—It may interest some of your younger readers to know, that the North Middlesex Photographic Society is commencing its annual course of Instruction Lectures. These are confined to elementary subjects, and are especially adapted for the requirements of beginners, or those not very far advanced in the study of photography. Visitors are always welcomed, and I shall be happy to give information to any one inquiring.—I am yours, &c., W. TAYLOR, *Hon. Sec.*

38, *Palace-road, Hornsey, January* 8, 1897.

P.S.—The first lecture is on January 18, at eight o'clock.

"THE SOUL OF TRADE."

To the EDITORS.

GENTLEMEN,—Enclosed is a bill which I should like the photographic public to see. Fancy paying rent and taxes on one cabinet and twelve midgets for a shilling! It is such people as these that drag the name of photography in the mire, but comment is needless.—I am, yours, &c.,

R. B.

[The circular is that of a photographer who offers to supply twelve midgets for 1*s.*, one cabinet for 1*s.*, or three *cartes-de-visite* for 1*s.*—EDS.]

To the EDITORS.

GENTLEMEN,—In order to show you some of the competition we have to put up with, I enclose you a copy of circular which has been largely distributed in the town and district in which my business is situated.

In the shop window of the grocer advertising these so-called *beautiful works of Art* is a photograph taken by me, of which an enlargement has been done, and is exhibited (with the photograph taken by me).

Have I no remedy for this, seeing the enlargement is not mine, and people may imagine it has been done by me?

I may mention, the frame and enlargement complete is, making a very liberal calculation, worth about 2*s.* 6*d.*; as the said frame is charged at 8*s.* 6*d.*, the grocer certainly loses nothing on the transaction.

Trusting you will find a small space for letter and circular,—I am, yours, &c., RALPH LESLIE.

19, *Station-hill, Kidderminster, January* 4, 1897.

[The circular enclosed by our correspondent refers to a coupon portrait system, which has many times been referred to in our columns. We fear there is no remedy in the circumstances mentioned.—EDS.]

To the EDITORS.

GENTLEMEN,—I enclose you a cutting from a Liverpool *liberal* evening paper. Is it not sad to see this advertisement, not this time by one of the profession, but by the editor of the leading Liverpool paper. The only comment I will make (and as you will notice on reading the same) is, Where are the artists that could get two to three guineas for what the Journalists are giving (carriage paid) for six shillings and sixpence? If you have room in your paper, and think it of sufficient interest, will you notice the same.—I am, yours, &c., W. T. SMITH.

126A, *Bold-street, Liverpool.*

[The cutting enclosed, refers to the offer of a "Two to Three Guineas" three-quarter life-size portrait for six shillings and sixpence.—EDS.]

To the EDITORS.

GENTLEMEN,—Referring to your Ex Cathedrâ of December 4, I ask what is photography coming to? It is expected to dance to the tune of every trade and fad. I think photographers are much to blame that they will walk into every snare laid before them. Lately, a gentleman called on me to ask me to take photographs for their firm—they sent out essence of coffee, and a coupon with the same. When people had drunk twenty bottles of essence, they had twenty coupons, which they sent to the firm—the coffee-drinkers then got a commission to go and get six cabinet photographs free. The firm wanted agents in every town and city to take these photographs for the handsome sum of 2*s.* 6*d.* per half-dozen. Of course I said no, which surprised the coffee man, and he replied that it was taken up so readily everywhere; he said I was the first who had refused. I think any one who would consent to such terms should be ashamed of themselves, and it was the duty of every one to refuse such conditions. Surely the photographic societies in every place should warn members against such schemes, and censure any who defile their hands with it. I also enclose advertisement of those who offer to take photographs for nothing; such tactics show a struggle for existence which cannot last long.—I am, yours, &c., C. SPENCE.

Station-road, Dunbar, January 8, 1897.

[We append the circular referred to:—

"A CABINET PHOTOGRAPH FOR NOTHING!—If you will send us a photograph, we will copy it, and send you a highly finished cabinet free of charge. This is merely done as an advertisement, and to show the readers of this paper the excellence of our work. Twopence in stamps to be remitted to cover postage and packing.—T. & C. Percival, Art Photographers, 47, Everton-road, Liverpool."—EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

George Gerrie, 66, Rosemont-place, Aberdeen.—*Photograph of Caroline E. Derecourt Martyn.*

Joseph Smith, 4, Lansdown, Stroud, Gloucestershire.—*Photograph of a potato dug at Exminster, near Exeter, Devonshire, representing a human being.*

Augustus John Ashbolt, trading as the Globe Photographic Company, 29, High-street, Southampton.—*Two photographs of St. Mary's Football Team, Southampton.*

F. GLEADOW.—Thanks. We will bear the suggestion in mind.

EXETER.—The case seems one for the County Court. Better consult a solicitor. You seem to have been badly treated.

J. H. CUSTER.—Practically we do not think there is any advantage in employing water at a higher temperature than 60° to 70°.

TRIMMING PRINTS.—X. O. Y. Either a knife or scissors may be used, according to taste. The former is the more generally used by professional mounters—almost universally for the larger sizes.

MOUNTANT.—C. SHORTER. Any cement, no matter under what name it is sold, that contains bichloride of mercury as an antiseptic, is totally unfit for mounting photographs with. Nothing is better for the purpose than freshly made starch paste or a thin solution of gelatine free from acid.

BROMIDE PRINTS.—S. COLMAN. The cause of the cold, heavy blacks in the prints is that they were under-exposed and forced in the development. Give more exposure and a less development, and you will obtain better colours, with more transparency in the shadows. The developing formula is all right.

BLACKING DARK SLIDES.—W. HIATT. It is not at all surprising that the insides of the slides are glossy if you coated them with ordinary black varnish. The only thing to be done is to clean it off again. This you may do either by washing it off with benzole or rubbing it off with glass paper.

ENAMELLING COLLODION.—OXON. Yes, methylated ether will do quite well for thinning enamel collodion; so will methylated alcohol, provided its specific gravity is not more than ·820. If it it is, there is a danger of the collodion yielding a crapy film. The methylated alcohol should be free from the mineral spirit.

ACETYLENE GENERATOR.—J. C. SHENSTONE says: "I shall be greatly obliged if you can tell me the name and address of the maker of the acetylene generator used by Professor Lewes, at his lectures to the Society of Arts, also if there is a London agent?"—In reply: We cannot say. Better inquire of Professor Lewes, care of the Society of Arts, John-street, Adelphi, W.C.

VICTOR SELB.—Davenport's combined curtain slide and panoramic carrie would probably meet your requirements. It is made by Mr. J. H Steward, 406, Strand, W.C. Better write him. It is described in th SUPPLEMENT of this JOURNAL for May 3, 1895.

STUDIO CONSTRUCTION.—A. J. A. says; "I shall be glad to know if in an of your back numbers there was an article on making a studio. Plea let me know the date of such number."—In reply: We have not recentl published any article on the subject. Messrs. Marion & Co. publish work on *Studio Construction*, by Mr. Bolas, which probably will give yo the information you require.

DISTORTION.—ARCHITECT. The reason the lines are curved at the margin the copies, while they are straight in your plans and drawings, is tha they were copied with a single instead of a rectilinear lens. We s you have a very just cause of complaint against the photographer, an are perfectly justified in refusing payment unless he replaces then with copies that are not distorted.

CARBON PRINTING.—WM. MICHELL. If the prints developed on collodionise glass do not come off readily when dry, it is proof that the glass was no properly prepared beforehand, either insufficiently waxed or French chalked. You do not say which you use, but probably the latter. I so, rub the chalk well and heavily on the glass, and then dust off. I this way no difficulty will be experienced in the stripping.

BITUMEN.—C. H. J. Powdered bitumen, for photogravure, may be obtaine from Messrs. Mawson & Swan, Soho-square. Messrs. Penrose, w believe, also supply it. You will find it more convenient to buy i already powdered than to powder and sift it yourself. The powder i a little more in price than the lumps. The specially treated, with ether, kind is of no advantage for graining the plates for photo gravure.

REMOVING VARNISH FROM NEGATIVE.—TOO THIN. If the varnish is a la varnish, and most probably it is, it may be got off by soaking the nega tive in methylated spirit If the varnish does not dissolve freely after say, half an hour's soaking, its removal may be assisted by gentl rubbing the film with a pledget of cotton-wool. If it is still refractory a little liquor ammoniæ may be added to the spirit. Finally, the surfac must be rinsed with two or three lots of fresh spirit to ensure complet removal before proceeding to intensify.

COPYRIGHT.—S. S. says: "1. We have a half-plate negative which we wish t copyright, how are we to proceed in the matter? 2. If a photograph o public buildings is purchased, without the photographer's name, or an statement that it is copyright on the photograph or card, can tha photograph be copied, and capital realised from the copies? 3. If copyright photograph is not marked copyright, and it is copied, are yo liable for so doing?"—In reply: 1. Send three prints and 1*s.* 7*d.* t our publishers who will do the needful. 2. No. 3. Yes.

VEILED LANTERN SLIDES.—D. MCLEOD says: "Some slides I have develope with ferrous oxalate are covered with a thin, whitish veil, while other developed with metol are quite free from it. It cannot be the fault o the plates, except with that developer, and it is the one I prefer. I this a peculiarity with the —— plate?"—No; it is common to al plates, and is due to the lime in the water forming oxalate of lime o the surface of the film. If the plates are treated with water slightl acidified with hydrochloric acid, the veil will be dissolved off.

OIL LANTERN.—H. WEITZELL writes as follows: "I have one of —— lanterns, with a three-wick lamp, but, do what I will with it, the smel and smoke from it are simply abominable when alight. I have taken i back, and the makers say there is nothing wrong with it. A friend ha one of the same make, but says his is all right. Can you tell me th reason why mine gives so much annoyance?"—The most prolific caus of smoking is the wicks not being evenly trimmed or not rightl adjusted, also the air draughts not being quite free. Smell, more ofte than not, is due to oil outside the wick tubes or the reservoir. T last thing before lighting the lamp, wipe all the outside and fitting with a piece of clean dry rag, and see that the wicks are evenly trimme All will, doubtless, then go right.

COPYING DAGUERREOTYPE.—W. F. S. says: "I shall be glad if you will giv me any information as to the best means to copy an old Daguerreotyp picture. There is only a very little trace of picture to be seen. I there any means of reviving it so as to make a passable copy from it?" —A Daguerreotype may be copied the same as any other picture, bu care must be taken that it is so lighted that there are no reflection from it that fall on the lens. Use a side light. If the Daguerreotyp is faded—*i.e.*, become tarnished—it can be cleaned, or restored, b treatment with a solution of cyanide of potassium, as has so frequentl been described in the JOURNAL. You had, however, better intrus this part of the work to an expert, as many a prized Daguerreotyp has been irretrievably ruined in the hands of novices. The Daguerreo type image is an exceedingly tender one.

A DICTIONARY WANTED. — DESIROUS TO KNOW says: "In reading you JOURNAL, I have been impressed very much with the fact that it i written in such an advanced style, for the average sssistant, and tha the number of new, or, at any rate, strange words, is surprising. have been reading it now for some years, but lately more closely, an have often thought, yea, *felt*, that the above has been the case. Onl one day last week it was spoken of to me by a young man, as being hi difficulty; I have no doubt there are many others. Yet I write now asking if you will kindly let me know whether a photographi dictionary is on sale, or rather published; a pocket form would be o immense value to assistants."—In reply: A *Dictionary of Photography* by Mr. E. J. Wall, and published by Messrs. Hazell, Watson, & Viney of Creed-lane, E.C., might suit our correspondent. It and simila works may be consulted in the Patent Office Library (admission free) Southampton-buildings, Chancery-lane, E.C.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1916. Vol. XLIV.—JANUARY 22, 1897.

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EX CATHEDRÂ.

E Glasgow and West of Scotland Amateur Photographic ociation will hold an International Photographic Exhibition a large scale in the autumn. An ample guarantee fund been subscribed, and the Galleries of the Royal Glasgow titute of Fine Arts have been secured for September and f of October. The prospectus will shortly be issued.

* * *

OUR remarks of last week with reference to the Institute of otographic Artists, of which a Mr. Luwee Harris, of 61 and Chancery-lane, W.C., appears to be either President or retary or both, have brought us the following letter from a respondent, who is a country photographer:—"A few s ago a business man told me he had received a ular from a London company inviting him to become a mber of the Institute of Sanitary Engineers at a fee of two neas. Reading to-day your Ex Cathedrâ notes, the similty of the two schemes struck me at once, so I sent round to friend, asking for the loan of the circular. I enclose you precious document without comment, as it will explain lf." According to the enclosures sent by our correspondent, Luwee Harris is President of the Institute of Sanitary Engineers, the prospectus of which bears a startling resemblance to that of the Institute of Photographic Artists—in fact, except as regards title, names of Directors, Council, &c., they may be considered identical, the leading features, particulars as to membership, entrance fees and subscriptions, privileges of members being the same in both prospectuses.

* * *

SOME of the members of Council of the Institute of Sanitary Engineers appear, according to the London Directory, to be builders, &c.; but, with regard to the Institute of Photographic Artists, we have been unable to associate the names of Messrs. Luwee Harris, E. C. Toller, Henry Snowball, H. H. Robinson, and other gentlemen figuring on the prospectus, in any way with photography.

* * *

THE Autotype Company, of 74, New Oxford-street, are now issuing a colour chart, consisting of eight miniature prints produced with their tissues. Both amateurs and professionals should find the chart useful, as it enables them to at once choose the tissue most suited to a subject. Two charming little portrait studies are reproduced in these tissues, the colours being standard brown, red chalk, dark blue, warm sepia, sepia, seagreen, portrait brown, and engraving black. The card is sent post free for sevenpence.

* * *

ABOUT a year ago there was a meeting of firms engaged in process-block making at which the whole of the trade was virtually represented, and an understanding was come to with regard to the minimum prices to be charged for tone and line work, eightpence and ten shillings, and fourpence and four shillings being, if we mistake not, the prices agreed to. We have since then seen much lower quotations than these, made, we believe, by firms who had not agreed to the minima above quoted; and now we are informed that even by firms who professed to be in agreement with the minimum price movement the evil principle of under-quoting their competitors has been embraced. We can only suppose that the agreement above referred to no longer holds good, as we find it otherwise hard to believe that process-block firms could be so blind to their own interests as to quote low prices in face of a nearly unanimous opposition to them in their own trade. It would be interesting to know the exact position of the minimum-price movement.

More than once lately we have been made the confidants of allegations similar to the foregoing, directed against some members of the Photographic Copyright Union, who, although under agreement not to allow their copyright photographs to be reproduced for a smaller fee than 10*s.* 6*d.* each, yet are alleged to have given way on the point, and accepted considerably lower fees. The time may come when the Union may deem it advisable to amend the rule with regard to the precise amount of the minimum fee to be imposed, but in the mean while it is neither honourable nor wise for its members to agree to one price and charge another. Men who cannot resist the temptation to break an agreement made with their fellow-members of a defensive Union should select the manly course of resigning from a body in whose ranks their further presence is not calculated to have a beneficial effect.

ON THE ALLEGED "NASCENT" CONDITION OF COMPOUNDS AND "RIPENING."

In an article by R. E. Liesegang, translated from the *Photographische Correspondenz*, on p. 8 of the present volume, on the subject of "Ripening" the author alludes to some experimental results obtained by two continental chemists, which we venture to think are scarcely in agreement with certain well-known circumstances in photographic chemistry or practice.

Herr Liesegang commences by alluding to the fact that bromide of silver emulsion is considerably raised in sensitiveness by keeping it in a warm condition for some time, during which it becomes coarser in grain. He goes on to say: "This arises from the single molecules of bromide of silver forming themselves into larger aggregates. The process is called 'ripening.'" From this it would appear that Herr Liesegang holds the opinion that "ripening" is necessarily attended by a coarsening of the grain of the emulsion, and, *per contra*, to assume that coarseness is a necessary sign of sensitiveness.

It is quite true that, in a general way and under the conditions of manufacture now prevailing, the increase in sensitiveness of a gelatino-bromide emulsion is actually attended by a coarsening of the grain as well as by a change of colour of the emulsion by transmitted light; but, that these phenomena are essential to the production of a film of the very highest sensitiveness, we think no one who has experimented much with either gelatine or collodion emulsions will be prepared to assert dogmatically. Rather we think they are necessary evils, which, under existing methods of getting sensitiveness, it is difficult, if not impossible, to avoid.

We have no doubt that many of those who a dozen or fifteen years ago dabbled in emulsion-making will remember to have come across at times an emulsion which, from some cause or another perhaps unexplainable, although fine in grain and red in colour by transmitted light, has possessed a degree of sensitiveness perhaps far in front of the coarse, blue films then so common. Such, at any rate, has been our experience; indeed, the two quickest emulsions we ever made in collodion and gelatine respectively were both remarkable for fineness and redness of their films. We remember too that the emulsion films prepared by Mr. Charles Bennett were marked by this same peculiarity, and, though they were perhaps far below modern emulsions of the highest class in rapidity, they were still far ahead of many of the coarse, blue films that came into vogue on the introduction of the boiling and ammonia processes of emulsification.

But, in collodion, emulsion practice, the ripening of emulsion is attended by neither coarsening of the particl bromide nor by any alteration in colour, unless it be a de ing of the red, and yet the process of ripening is at lea important in attaining sensitiveness as it is with gel Some years ago Captain Abney published a formula fo extremely rapid collodion emulsion, in which the sensitiv was arrived at by means of ammonia in much the same w the latter is now applied to gelatine; but these films, alth extremely sensitive and blue in colour, were scarcely of practical use, on account of their extreme thinness and impossibility of intensifying the image. The blue colour granularity of image in connexion with collodion emu have, in fact, always been regarded as the signs of a poor useless preparation.

And yet, to show how little do sensitiveness and other q ties really depend on these accidental peculiarities, we h collodion emulsion a few days ago, prepared for experim purposes, that presented the most intensely blue colou transmitted light that we have ever noticed, the intensity purity of the colour being enhanced, no doubt, by the that the bromide was in an extremely fine state of div instead of being, as usual with such a colour, coarse. It this that induced us to give it a trial before putting it ar the waste, when, to our surprise, it proved to be extre slow, but gave more than average density in place of the reverse qualities, as might have been anticipated.

To return to the question of ripening, it seems to us although the process may be, and in the case of gel generally is, accompanied by the coarsening and chang colour, these do not constitute "ripening" proper. The ripening, there seems to be little doubt, consists in a gra combination more or less intimate between the silver and vehicle in which it is held. If it were not so, but si coarseness or aggregation of the particles of silver constit ripening, and led to sensitiveness, what easier than to a at the result without either heat or waste of time? Bu all know that, whatever may be the other qualities of emulsion that is coarse from careless mixing, sensitivene certainly not one of them. Moreover, in favour of the th of chemical combination, we have only to look at the differ between gelatine and collodion. With the latter, no am of ripening, either with or without the aid of heat, amm or other means, will give anything like the sensitivene gelatine, because the collodion is incapable of forming necessary compound.

But the point in Herr Liesegang's article that we wish particularly to call attention to, and to combat, is the s ment that the bromide of silver in an emulsion is for instantly the nitrate of silver is added. This not only up one of our most cherished emulsion beliefs, if it be r true, which we do not think it is, but leaves some fac dire need of a satisfactory explanation.

Let us quote Herr Liesegang: "At first there was a clination to believe that the reaction of the two substa was very slow; that nitrate of silver could remain for a in solution with bromide of potassium without forming bro of silver . . . . but, from experiments relating to the trical conductivity of bromide of silver emulsion (Col . . . . it is shown that the double decomposition is comple effected at once." We have to deal only with emulsions, we may say, in passing, that we believe it has been stated verified that, even in aqueous solutions, the last traces of si

ate and of bromide of potassium do not combine for a very ; time, if at all, but that there may remain an "excess' ach.

f the salts combine "instantaneously," or "immediately," or once," how will Herr Liesegang explain the following umstance? Let a small quantity of collodion be sensitised he usual way, taking care to leave a decided excess of ble bromide. This excess need not be cut down to a mere e, but may be equal to two or three grains of bromide to ounce of emulsion. Now, after a vigorous shaking, but n as little delay as possible—say, within a few minutes— a few grains of tannin, and the result will be that the lsion will take the colour of French polish from the nation of tannate of silver.

f the combination takes place at once, and in the presence n excess of soluble bromide, how comes the tannin to act n the silver bromide that has been formed, even supposing o exist in what Herr Liesegang calls the "atomic" or scent" condition? If, in this alleged condition, it is nable to the decomposing action of tannin, we should er to consider that it has not altered its condition at all.

nother case we will give. Let an emulsion, immediately r sensitising, be precipitated by pouring it in a thin stream water. While the cotton is thrown down in "flocks," and ortion of the silver bromide is combined with them, the ter part of the latter forms in the water, owing to the com- tion of the silver nitrate and bromide as they are washed of the precipitated cotton. If a portion of the same emul- be kept two or three hours or longer, and treated in the e way, the whole of the silver will remain with the cotton, the water remain perfectly clear.

ut, that the two salts can remain for very long periods un- bined when the conditions are favourable, the following dent will, we think, prove. The conditions are not such as ld prevail under ordinary circumstances, but they are such specially favour the non-combination of the silver and nide, although in contact with one another. In the very y days of the gelatine process, probably 1873 or 1874, in ng different kinds of gelatine, we unearthed from the old e of a retail chemist a packet of the article by a maker we er heard of before or since—Bell, we think, it was. It was articularly colourless sample, and possessed other pecu- ities, one of which was that it gave an apparently very thin easy-flowing solution when far more than the ordinary pro- ion was dissolved. This peculiarity, we dare say, either uced or compelled us to try a very concentrated emulsion, ar at least as gelatine was concerned, either 80 or 100 ns to the ounce being the quantity used with the salts in ut usual proportions.

ow, although that emulsion was liquefied and kept warm some time, not every day, but very frequently during six even weeks, the combination between the salts never went h past the opalescent stage, and never got any further. en poured on glass, it resembled plain gelatine. At last we ught that combination must have taken place, and that the er bromide was in some such condition as that which Herr egang calls atomic, so we proceeded to finish the emulsion use. It was in the days of dialysis, and the emulsion was y poured into the dialyser and left to float all night in a el of warm water; and here is where the peculiarity comes The silver nitrate and potassium bromide passed through dialyser separately, and combined partly outside and partly he septum itself until its pores became clogged, the bromide of silver forming on the outside of the parchment independent needle-like icicles or stalactites.

Now, if the salts had combined at once, and the bromide of silver had remained all this time in the "nascent" or atomic condition, it is possible to conceive that, in its new state, it would pass through the septum. It is even possible to understand that it might also aggregate in the form of stalactites; but it is not possible to believe that, in its perfectly formed but atomic condition, it should, for a time, pass freely through the septum, and then suddenly take to blocking up its pores.

There cannot be the least shadow of a doubt that, at the commencement of the process of dialysis, the diffusion was so rapid that a portion of the salts passed through the septum while another portion combined during the passage, and this went on until the pores were entirely closed and the process came to a standstill. The parchment, on removal from the dialyser, presented one perfectly clean smooth side, while the other was as "spiny" as a porcupine, and the whole as brittle as an egg shell, from the formation of the bromide within it.

There is just one more illustration we may bring from outside emulsion work which scarcely supports the theory of instant combination. When solutions of oxalic acid and ferrous sulphate are mixed, the formation of ferrous oxalate, at least in the solid or precipitable form—is very slow, the mixed solutions remaining clear for some time with a gradually deepening yellow colour, which eventually becomes cloudy and slowly deposits the yellow oxalate of iron. According to Herr Liesegang, the latter is formed at once, and must therefore be in solution. How, then, does he account for the colour of the solution being only deep yellow or orange when the same quantity of oxalate of iron is much less when redissolved in oxalate of potash will make a rich ruby solution? The "nascent state of compounds" seems to require a little more clearing up before it will agree with some older theories.

New R. A.s.—At the meeting last week, Mr. J. S. Sargent was elected as a Royal Academician, and Messrs. A. Parsons and J. J. Shannon as Associates. It was prophesied by many of the "well-informed" that Mr. Leader would be chosen for the full honours instead of Mr. Sargent. In the elections to this body predictions frequently turn out wrong, although made by those who claim some authority. It was notably so in the case of the election of the present President.

A New Use for Calcium Carbide.—The production of acetylene gas does not appear to be the only *rôle* capable of being played by this new chemical agent. Mr. H. N. Warren, Principal of the Liverpool Research Laboratory, contributes a paper to the *Chemical News*, describing a series of experiments he has been making with the carbide as a reducing agent. A considerable amount of success has attended his work, but at present we do not see a probability of any indications of its usefulness in photographic waste reductions.

Acetylene in Railway Carriages.—We learn that the London and North-Western Railway Company are about to try the experiment of lighting their passenger cars by acetylene. Already a trial trip has been made with a lavatory carriage attached to the 5.30 p.m. Manchester express, the results being highly satisfactory, the light being as much superior to the ordinary gas-lit carriages as they are to the oil-lamp-lit cars. The light is said to have been more like daylight. It is stated that compressed gas is being used. This being the case, it will be interesting to learn whether the railway company, which, for its own purposes, carries and uses compressed acetylene, will throw any difficulties in the way of its being carried in cylinders for the general public or the lanternists.

Peterborough Cathedral.—The pulling down of a portion of the west front of the Cathedral, about which there has been so much controversy of late, is now being proceeded with. The large cross surmounting the north gable has been removed, and the taking down and numbering of the stones is going on apace. It is stated that many of the stones are found to be perished to a much greater extent than was expected. This would seem to justify the Dean and Chapter in the course they have taken on the advice of their architects. Time alone will show whether the beauty of the front will be destroyed to the extent that some antiquarians and artists prognosticate. An insecure structure, however beautiful, is always a danger to the public, and that has, no doubt, weighed much with the Dean and Chapter, who, by the way, have been about the best abused body in the country during the last month or two.

Disfiguring Advertisements.—How often has the photographer found, when he has visited some place of interest with a view to photographing it, that, if taken from the best point of sight, some hideous advertisement or other must be included in the picture. In such cases, painters are better situated than photographers, as they can omit the offensive object, but the latter cannot. Last week, the National Society for Checking the Abuses of Public Advertising held a conference in the Hall of the Society of Arts. The meeting was fairly well attended, and letters were read from several artists sympathising with the object in view. Several suggestions were made, amongst which was one, that of exhibiting at meetings, by means of lantern slides, illustrations of rural and urban disfigurements. Every one of our readers, we know, will wish the Society every success, though we must confess we do not expect very much. Every one has a right in his property, and if an agriculturalist can get a good rental from the advertisements on his land, which practically take up no room, he will not be likely to let sentiment prevent him, however ugly it may make the landscape.

Piracy.—Fine-art publishers in this country suffer badly at the hands of photographic pirates, and the detection of the real offenders, that is, those who make the photographs, is exceedingly difficult. On Wednesday, last week, an offender was mulct in the sum of 32*l.* 6*s.* penalty and costs for selling photographic copies of such works as *The Peacemakers, First Words of Love, Wedded, 'Twixt Love and Duty*, &c. A witness who hawked the piracies about among City offices said that the pictures were coloured photographs, and he bought them of the defendant, framed and glazed, at four shillings each, and sometimes sold them for as much as fifteen shillings each.

Four shillings for a large photograph, coloured, and framed, and glazed, is not a very large sum, and from the published report of the case—as there was no forfeiture of the negatives ordered—we conclude that the defendant was not the actual producer, but a middleman. What, then, could be paid to the one who actually produced the photographs, the real delinquent? It seems almost incredible, seeing the small sum it must necessarily be, that any one would risk the penalty of ten pounds for each print sold. We have seen it stated that these photographic piracies are mostly produced in Germany. We have a very strong impression, however, that they are made much nearer London than that. English publishers suffer far less from German photographic pirates than do the German publishers at the hands of English pirates.

Stolen Property.—Advice on an interesting point was sought from the Magistrate, Mr. Shiel, at the Westminster Police-court one day last week. The applicant said that, some months ago, he purchased at a public auction (Theobald's, Farringdon-road) a gas cylinder, worth about two pounds. He sent it recently to Brin's Oxygen Company, Westminster, to be tested. There it was detained, as he was informed that it was stolen from one of their customers, and he had no title to it. The Magistrate told the applicant that, as Farringdon-road was not in the City of London, it was not market *overt*, "and you will have to give it up." He further said, in to the query, "without recompence." If you buy stolen pro even innocently, you must taken the chance of its being claime the rightful owner. Here the law seems to be a little anoma for, had the auction rooms been within the City boundary purchaser would have been entitled to his purchase, even thou had been previously stolen.

The City appears to enjoy special privileges in the matt market overt, for, if any one buys from a shop window, where it publicly exposed, any article that has been stolen, he is entitle keep it; but, if a similar transaction takes place, say at the W end, the case is the reverse. We believe, however, in the Cit the thief is caught and convicted, the property must be given u its owner. We allude specially to this case, because there very general idea that, when things are sold at a public auc the purchaser has a good title to them, even supposing t at some time or other, to have been stolen. Such, however, is the case, and purchasers of photographic apparatus, so much of w is sold second-hand, should keep the fact in mind. By the wa gas cylinder is not the kind of thing one would imagine w tempt the light-fingered gentry.

A New Crookes' Tube Usable without a Ruhmk Coil.—Attempts to utilise the commercial alternating current radiographing without a coil have met the obstacle of finding emitting centres on each electrode of the coil become, in turn, cathode, the photographs being consequently blurred. The difficu however, has been overcome in an ingenious manner by an alt tion in the form of inner extremity of the electrodes, designe Drs. Oudin and Barthélemy. The electrodes have been furni internally with two aluminium discs, concave in shape, and placed at opposite ends of the tube as to face one another, and h their focus at a common point. At this point, and symmetric placed, in the axial line, as regards the mirrors, at an angle of is fixed a piece of platinum. When one of the aluminium mir acts as cathode, it sends the whole of its rays upon the platin which reflects them towards one hemisphere of the tube, and so v the other. The inventors state that, with a frequency of alter tion from 40 to 100, the necessary steady illumination has been duced, and the results have been equal to those obtained wi Tesla coil. One point necessary to bear in mind is that the suri even of the platinum must be greater than that of the mirrors, s to stop all the rays sent by them; otherwise the high frequenc the current would cause the aluminium mirrors to heat and melt.

Kite Photography.—Additional point is given to our re remarks upon the application of kites to photographic purp *apropos* of recent achievements in the United States, by an ar on the subject in a recent issue of *La Nature*, over the signatur Arthur Batut, who, seven or eight years ago, made of kite ph graphy an accomplished fact. Since that time he has modified system of construction, and, in the light of a large number experiments, introduced many improvements. His first appara was cumbrous, but now it is made to take to pieces, and its carri is not only possible, but easy. The band of the kite, instead of be permanently attached to the arms, is simply secured by four buck at the ends of the arms. The paper is replaced by pongee silk, i the skeleton fixed by winged bolts. It is thus seen how very po able the apparatus must be. The tail is made of broad st stiffened by a fine wire, run along the middle, with the steady pieces attached to the edge; there is thus no fear of its getting tangled. The camera, in lieu of being fixed, as at first, to the fra work of the kite, is secured to the band, and so enables a ligh cord to be used to fly it with. The previously used guillot shutter is replaced by a rotary one working between the lenses, a worked by an indiarubber band. It is evident from this descript that the kite used is more like the toy of one's boyhood than instrument made use of in America, but that is merely a det

As to the actual usefulness of the instrument for serious purposes, it is sufficiently attested by an excellent reproduction of a photograph taken by means of the new kite arrangement and accompanying Mr. Batut's paper.

Stereoscopic Opera Glasses.—Messrs. Zeiss, of Jena-glass fame, have devised an opera glass of novel construction. It was recently pointed out in these columns that, beyond a certain distance from a twin-lens camera, stereoscopic effect was not produced, and the same principle governs the action of the eye. Except by reason of practised judgment in comparing objects of known size, and to knowing distance or relief intuitively, the eye is incapable of itself of distinguishing between different planes beyond a given point. As a matter of course, there is no limit to the distance at which stereoscopic effect can be produced if the lenses are separated to a greater distance. This effect Messrs. Zeiss have taken advantage of in their new instrument. The object-lenses of the tubes of the opera glass are placed at the side instead of, as usual, at the ends of the instrument, which is made to open out into one straight line and so throw the lenses some distance from one another, and by means of an ingenious arrangement of prisms the rays passing through the objectives are bent back so as to arrive at eyepieces fixed the usual distance apart. By this means it is quite easy to see the view over a wall much higher than the spectator, or for him to hide behind a tree and project his lenses on each side of the trunk and enjoy the view beyond as though he observed it in the accustomed manner. The great advantage, however, that the new arrangement possesses is that, when the lenses are well separated, distant objects are seen with true roundness, and planes of varying distances are appreciated. For military purposes the new form will be valuable in enabling distances for training artillery to be better appreciated, as also the actual depths from back to front of bodies of troops at a distance. There can be little doubt that the idea of the new instrument has been suggested by the method of old stereoscopic workers of removing the camera between the two exposures to points some distance apart when distant objects were being photographed for stereoscopic views.

JOTTINGS.

Lord Melbourne, Her Majesty's first Prime Minister, was a wise man. It is said that, whenever anybody went to his Lordship with a scheme for reforming or altering something that did not urgently need reformation or alteration, the Premier would say, "Can't you leave it alone?" *Laissez-faire*-ism is the pet aversion of doctrinaires, and of those people that are to be found in all walks of life, who are never so happy as when pulling a thing down because it happens to be standing up; and yet it is a principle which, at times, is not without its virtues and practical advantages. Reform and progress are always good and desirable in the abstract; in the concrete they not infrequently give rise to disappointment and the sensation of failure; hence one can appreciate the sound common sense of Lord Melbourne, and of the sage that preceded him by a considerable number of years, who concentrated a world of wisdom in three words, "Let well alone."

The so-called "new blood on the Council scheme," that has just been the cause of some changes in the Royal Photographic Society, strikes me as being eminently one of those cases where well would have been best left alone. Theoretically the idea of assuring a constant flow of fresh blood into a governing body is a good one, a very good one—on paper; practically, its advantages have to be taken altogether on trust. But, at best, this plea for "new blood on the Council" is a mere doctrinaire's cry, and nothing more, with just about as much sincerity in it as the cries of Messrs. Tadpole & Taper, the political wire-pullers, who figure in one of Disraeli's biting and brilliant novels. It is a cry that sounds well, is specious, and is attractive to the crowd, and that is about all you can say in favour of it.

Of course, the "reform" will be passed by the Society in due course. It can do no harm; it will probably do no discoverable good. The position of the "reformers" has been weak and unsubstantial all through the piece, by reason of the circumstance that they have had no real or existing abuse to combat. The "new-blood" shibboleth, in fact, simply anticipates a condition of things that might arise—it is nothing more nor less than speculative legislation, and therefore uncalled for, as Mr. C. F. Townsend makes abundantly clear in his somewhat unwise letter on page 31. He points out that at least two vacancies (on the Council) have naturally occurred every year, so that only the three senior members would have to retire. As the object of the reformers is, therefore, partly gained automatically—by the way, I believe that during the last five or six years four, if not five, "new" men have annually gone on the Council—the necessity for "reform" is not obvious. Mr. Townsend's reference to two parties in the Society, and his application of the term "nonsense" to some remarks in Captain Abney's letter, and other pugnacious observations, are probably very good evidence of the "independence" he claims, but, in the interests of that harmony of feeling which should animate the members of a society like the Royal, are perhaps to be deprecated. I, however, agree with Mr. Townsend that the nomination system is an objectionable way of influencing the votes of the rank and file of the Society, and I believe that it is due to this publication of nominators' names on the balloting papers that the hollow and artificial agitation for new blood on the Council entirely owes its origin.

"Timidity" is defined by the dictionaries as a want of courage to meet danger, and the attitude of this Journal on the acetylene question has misled my excellent friends of the *Photogram* into accusing the British of giving way to "unnecessary timidity." Clearly we have here a mistaken application of terms. The so-called "scare" that was raised was in reality what was wanted, and, if I mistake not, has been the direct means of doing a great deal of good. The principal fire offices, acting in ignorance or under a misapprehension, declined to grant policies on premises where generated acetylene was used. Attention was repeatedly drawn to the matter, and the practical non-existence of danger in the use of generated acetylene pointed out, with the result that already some of the offices have, I believe, withdrawn the objections they were disposed to raise. This is the first time I have seen the action of a paper, in thrashing out a subject that is of considerable interest to its readers, characterised as "timidity," and I may perhaps be pardoned for inquiring whether, supposing The British Journal of Photography to have left its readers in ignorance of what the insurance companies were doing, it would have been credited with the antipodal quality of timidity, viz., courage.

The letters under the heading "The Soul of Trade," on pages 47 and 48, revive an old grievance of professional photographers — that of the cutting of prices — upon which it is difficult, if not impossible, to say anything which has not been said before. I wish I could give the complainers the small consolation of the assurance that these very cheap contact prints and enlargements are, as a rule, very bad in quality, as well as low in price, for then there might be some hope of the public tiring of such productions and demanding better work at higher prices. But I cannot go so far. I have at times been very much surprised to notice the really good quality of these extremely cheap photographs; indeed, before me as I write is a cabinet photograph, one of three for two shillings, produced by a London firm, which, as a specimen of silver printing, lighting, posing, and retouching, compares very favourably with work for which considerably higher prices are paid. It is the photograph of a member of my own household, and the effect of its cheapness and good quality upon those of the fair sex to whom it is shown may be easily imagined. To a man—or rather a woman—they say, "No more guinea a dozen cabinets for us!" Can you blame them?

Of course, the medal has its obverse; this cheap but good photograph comes from a man who has a reputation for working his *employés* very hard and paying them poorly; he "squeegees" them as

the hypocritical old patriarch in *Dombey and Son* was always urging his rent collector, Mr. Panks, to do to his tenants. The profits, in fact, are squeegeed out of the *employés* instead of out of the sitters. This is a sad state of things, that can only be remedied by means of the operation of some system of trades unionism, and which is a question for operators and assistants to take in hand. As to the main point of the cutting of prices, with the supplementary subjects of free-portrait schemes, photographers taking portraits for nothing, newspapers advertising excessively cheap enlargements, and similar matters, it is vain to look anywhere for help or sympathy but to public opinion expressed and fostered in a JOURNAL like this. A remedy will never be found until photographers possess a central representative organization competent to act and move in their behalf for the regulation of such matters as prices, &c. One day, perhaps, the Photographic Copyright Union may widen its scope of action, become simply the Photographic Union, and watch over other photographic interests besides copyright. There is plenty of room for it, and work for it to do.

Lippmann, doubtless, well deserves the progress medal of the Royal Photographic Society that has just been bestowed upon him, although his claim to be the actual "discoverer" of interference photography has been here and there, possibly not without reason, called into question. However, whether he availed himself of already-known theories or not, he was admittedly the first to produce results by the interference method, and so paved the way for the really beautiful colour work of the Lumières, which has not yet been surpassed. I hope Mr. John Wallace Bennetto is not annoyed that the progress medal was not awarded to him; but I have no doubt that, if his process is all that he claims for it, and he publishes particulars of it in time, he will stand a good chance of securing the medal next year, although, perhaps, he would not much care to accept such a cheap distinction as he possibly regards this progress medal to be, which even a mere Frenchman, who has actually produced and publicly shown photographs in natural colours, has been asked to accept?

Rumour has it that an attempt is to be made to put the Photographers' Benevolent Association on its legs again. If the attempt is backed up by photographers, operators, photographic employers, and others, for whose assistance in the hour of need such an institution primarily exists, it will deserve to succeed—but not otherwise. The committee of the present moribund association have for years worked hard in the most self-sacrificing way, and it is to be hoped that, as they hold the field (the Benevolent apparently not having legally expired), they will not consent to undertake a fresh lease of active responsibility unless they are supported by those for whom the Benevolent is to be worked.

I have a note to congratulate the Photographic Club on the institution of a series of Trade Nights, at which apparatus can be shown by the trade, and discussed and criticised by the members and visitors present. A friend, who is a member of the Club, says that the meeting on January 6 (reported at page 45) was most instructive to those who were interested in flashlight work. He also tells me that the Club's next Trade Night is down for March 3, and, as that is at a time of year when out-door photography begins to attract the attention of amateurs, there is an excellent opportunity for a good show of seasonable apparatus.

Reference to flashlight work suggests the reflection that there appears to be quite a revival of interest in this branch of artificial light photography. I hope that those taking it up for the first time will exercise the greatest care as to the particular compounds they employ. The reference on page 42 to the use of a mixture of magnesium and a potash salt should act as a reminder that some compounds of magnesium with potash salts are, to say the least of it, not the safest mixtures to handle except with the greatest caution. To those taking up magnesium work for the first time I would recommend the study of a work by Fourtier on the use of artificial lights in photography. It is in French, is published by Gauthier-Villars, of Paris, and tells you all that is known about the properties of the various bodies used in flashlight work. COSMOS.

THE GRAIN OF DRY PLATES.

R. E. LIESEGANG, in the current number of the *Photographisches Archiv*, states that he investigated the question of the grain of dry plates shortly after Schumann, Ostwald, and Gaedicke, who by chance referred to the size of the grain in negatives, and the relation to the sensitiveness of the plates.

Schumann, who has now been obliged by his physician to discontinue all work, determined that the grain of the negative need not correspond to the grain of the original silver bromide grain. This was of special interest, because in his spectroscopic work he required extremely fine-grained negatives in order to enable accurate movement of the lines to be done. He exposed a plate cut into three parts and developed the first in a normal pyro developer. For the second a small quantity of bromide of potassium was added to the developer, whilst for the third part a considerable quantity of bromide was used.

The well-known action of the bromide was at once manifest, as the third section was much more full of contrast than the first. At the same time a hitherto unknown action of the bromide was seen, which perhaps helps only secondarily the increase of the contrast. The first section was so fine-grained that the grain could only be detected with a microscope. The third section was so coarse-grained that the particles of silver were actually separated by spaces of clear glass, and had the appearance of the grain of a half-tone block. The second section had a medium grain.

The original grain can be enlarged by the addition of potassium bromide, and Schumann believed it correct to assume that some of the silver bromide dissolved in the potassium bromide, and that the developer reduced the dissolved salt and that the nascent silver was precipitated as in physical development on the silver grains of which the image is composed.

It may also happen that the enlargement of the grain may be caused by the prolongation of the development by the bromide, for Liesegang states that he he has already pointed out that in prolonged development with an alkaline developer the grain may increase just as the grain in a finished negative may increase by heating it. It should also be noted that Schumann used an emulsion very poor in gelatine, and therefore any action would be more pronounced than in an ordinary dry plate.

Later on, Gaelicke pointed out the possibility of another function of the bromide, for in the film of emulsion there are not silver bromide grains all of one size, but of very different sizes. The potassium bromide would then only destroy the action of light on the smallest grains, whilst the larger particles would be less attacked, and therefore be blackened by the developer. This would explain, moreover, the increase of the contrasts. To explain Schumann's phenomenon, another hypothesis was necessary.

Ostwald does not believe that the increase of light sensitiveness of an emulsion need be dependent on the increase in the size of the grain. All compounds exhibit a tendency to enter into a more stable form, so that the light sensitiveness should thus actually decrease after the ripening. Ostwald, therefore, believed that the silver bromide gradually entered into combination with the gelatine.

Schumann has shown a very beautiful experiment, which proves the sensitising action of gelatine. He coated half a glass plate with solution of gelatine, whilst the other half was left blank. He then placed it in a water bath, in which finely divided silver bromide was suspended, and which settled regularly over the whole plate. Both parts of the plate were simultaneously exposed and developed, and the gelatinised half gave a normal, vigorous negative, whilst the half free from gelatine gave scarcely the trace of an image.

FOREIGN NEWS AND NOTES.

Absorption.—Professor H. C. Vogel has made a series of experiments, concerning the amount of light absorbed by optical glass, for determining the dimensions of the new refractor for the Potsdam Observatory, with special regard to its photographic use. The results of these experiments are given in the *Photographische Correspondenz*. Vogel's observations agree with Eder and Valenta's. Absorption does not increase constantly at the same rate as the

wave-lengths diminish. There is, rather, a constant action over a considerable length of the spectrum, and then a noticeable leap about the region of the G and H lines. Further, with certain specimens of flint glass about 15 cm. thick, two bands of absorption were found; a very weak one at $\lambda = 437$, and the middle of the other, more definite in character, at $\lambda = 418$.

For quickly observing the absorption of the more refrangible rays, H. C. Vogel exposed chloride paper under the specimens of glass. The relative absorption was indicated by the time required for colouration of the paper, and silver chloride was very suitable for the purpose, being especially sensitive to the violet and ultra-violet rays. It was found that flint glass transmitted 0·35 to 0·52, and crown glass 0·59 to 0·60 of the light.

On an average, it may be taken that ordinary light flint and ordinary silicate crown of Jena make possess the following degrees of absorption for various thicknesses:—

Lens thickness in centimetres.	Intensity of transmitted light and units of incident light.			
	With reference to absorption only.		With reference to absorption and reflection.	
	Visual rays.	Most active chemical rays.	Visual rays.	Most active chemical rays.
4	0·93	0·84	0·77	0·69
6	0·90	0·77	0·75	0·63
8	0·87	0·71	0·72	0·58
10	0·84	0·65	0·70	0·53
20	0·71	0·43	0·59	0·35
30	0·60	0·28	0·50	0·23
40	0·51	0·18	0·42	0·15

From this table it follows that the large objective of the new refractor at Potsdam, with an aperture of 80 cm., and thickness of 12 cm., loses 40 per cent. of the chemically active rays by absorption. From absorption and reflection together, 51 per cent. are lost. The intensity of transmitted, compared with incident, light is, therefore, as 49 to 100.

Combined Gold and Platinum Toning.—Professor A Lainer gives the following directions in the *Photographisches Correspondenz* for toning matt celloidin paper. The process gives warm, pure black, brown-blue, or violet-black tones, and likewise a peculiar grey black with very pure whites. It is very essential that the hands should not come in contact with the fixing bath whilst toning, as the slightest trace of hyposulphite produces stains and markings. The process should be studied by toning prints singly to arrive at the method of obtaining special tones, printed instructions being of little value for this purpose.

1. The pictures should be fully printed and immersed singly in a dish of water. Not more than ten at a time should be treated, and they should be washed for ten to fifteen minutes in two changes of water.

Too much washing, warm water, salt, and hydrochloric acid prevent subsequent direct toning with platinum. If the washing is omitted and the print placed in the platinum bath direct, without gold toning, sepia tones result after fixing, which may be carried to the black stage in the clearing bath, but the platinum bath rapidly discolours.

2. The washed prints are placed in a gold bath for a few seconds until they assume a brown tone.

Stock solutions:—

A.

Acetate of soda	10 grammes.
Borax	10 „
Water	1000 c. c.

B.

Chloride of gold	1 gramme.
Water	100 c. c.

Mix, before use, 100 c. c. of A and 2 c. c. of B. After toning lay the print in water.

This gold bath is not absolutely necessary, but it is not without influence upon the purity of the final tone, and should never be omitted for grey black. If warm brown or brownish-black tones are wanted, the prints may be transferred to the platinum bath after quickly rinsing in water.

3. The prints are placed singly in the platinum bath and toned to the dark violet or blue-black stage.

The platinum bath may be made as follows:—

Water	100 c. c.
Phosphoric acid	2·5 „
Ten per cent. solution of potassium chloroplatinite	2 „

If the bath is fresh and good, the prints tone immediately, but, if the prints do not change rapidly from brown to violet, a new bath should be used, and the dish cleansed thoroughly. The slightest trace of hyposulphite spoils the bath, and, the prints will not go beyond the red-violet stage. Short immersion in this bath will produce warmer tones.

4. After the platinum bath, the prints are washed for a short time to remove the phosphoric acid, and then transferred to a ten per cent. fixing bath of hyposulphite of soda. It is very important to use a fresh fixing bath, and, when large numbers of prints are treated, to renew the bath frequently, and not fix all in one bath.

After fixing, the prints are washed for twenty minutes in four or five changes of water. At this stage the tone is usually brown, and, if satisfactory, the prints should at once be mounted.

If pure black or grey to blue-black tones are wanted, the prints should be washed, for five minutes only, in several changes of water, and then transferred to the clearing bath.

5. The clearing bath consists of—

Water	1000 c. c.
Sulphocyanide of ammonium	100 grammes.
Chloride of gold and potassium solution (1 in 100)	20 c. c.

The clearing bath may be used repeatedly, but must be kept clear by filtration.

The clearing bath equalises the tone of the prints, and, according to the length of immersion (from five to fifteen minutes), the final tone may be modified.

Mounting.—The following is given as an effective style, by N. Ley, in the *Photographisches Archiv:* After stripping glazed gelatino-chloride prints from their supports, they are trimmed to the required size. An oval or other suitable shape is cut out of a piece of matt celluloid, and two wooden blocks are prepared, one the shape of the aperture and the other the shape of the mask. The sheet of celluloid is laid upon the back of the print, and the shape of the aperture is traced upon it in pencil. This is then covered with the block of corresponding shape, and the margins of the print pasted. The mount having been previously prepared, by pasting upon it a piece of blotting-paper of the size of the print, the pasted print is transferred to the mount, and the second block, with the clear opening, is placed upon it. The print with the block in position is then passed through a press. The surface retains its high glaze in the centre, and the margins are matt.

Copying Maps.—W. Cronenberg, in the *Photographisches Wochenblatt*, describes his method of reproducing maps and similar subjects, in which it is necessary to render the finest detail correctly. A wet-collodion negative is made upon plate glass, and, after thorough washing, coated with bichromated gelatine, and dried at a moderate heat. The negative is laid face downwards upon a black cloth, and exposed to light from one to three hours, according to density. The plate is then washed to free it from bichromate, hardened in an alum bath, again washed, and allowed to dry spontaneously. It is then etched with a solution of glycerine, and a perfect print is taken from it in transfer ink upon transfer paper. The print is transferred to stone, and reproduced by lithography. The transfer may be omitted if collotype prints are preferred.

Stand Development.—According to Raimund Rapp's article on this subject in *Die Photographie*, stand development has been practised very much of late in Germany by amateurs. The developer is diluted to about one-hundredth of its normal strength, and the plates are allowed to develop themselves in a grooved trough. Well-exposed pictures are fully developed in from fifteen to twenty minutes, but under-exposed plates may take an hour or more. The principal advantage claimed by Rapp is finer gradation

in the negative. Two plates were given a normal exposure; one, developed in the ordinary way, gave scarcely any trace of clouds in the sky and a hard picture; the other, developed in the manner recommended, not only rendered the clouds, but very fine half-tone with soft modulation and exquisite atmosphere. For stand development he recommends glycin or metol without addition of alkali. The following is Hübl's formula for the glycin developer: Twenty-five grammes of neutral sulphite of soda are dissolved in forty c.c. of water, ten grammes of glycin are then added, and, finally, fifty grammes of carbonate of potash. The potash should at first be added in small quantities, owing to the liberation of carbonic acid. This makes a thick, concentrated solution that will keep well, as the glycin is not dissolved but held in suspension. For use, a suitable quantity is taken and diluted one hundred fold. If an acid fixing bath is used, the plates should be developed rather stronger than usual, as some reduction of density takes place.

TIMING DEVELOPMENT.

[Read before the Doncaster Camera Club.]

Judging by my early experiences in the study of photography, I am led to believe that development may be considered the *pons asinorum* of our interesting art-science. I had always been more or less unsuccessful in producing respectable negatives by what is termed tentative development, and the papers by Mr. Alfred Watkins, of Hereford, in the early part of 1894, entitled, *A Method and Instrument for Timing Development*, showed the question to me in quite a new light.

It is out of my province in this paper to deal with the subject of correct exposure, and I will merely explain in passing that I believe this is considered by Messrs. Hurter & Driffield to be a period which produces a range of densities having a regular mathematical ratio to each other. Mr. Watkins pointed out that, in order to secure a correct range of gradation, the time of development was as important as accuracy in exposure, and, whilst it must be borne in mind that his method of timing development will not compensate for gross errors in exposure or the use of an unsuitable developer, I shall endeavour to demonstrate to you this evening that within reasonable limits of correct exposure (which may be determined by one of the numerous exposure meters or tables on the market), together with one of the commonly known formulæ for development, it is possible to produce very satisfactory negatives.

The latitude which may be permitted in exposure varies with the make of plate; I have obtained very good results on some plates with as much as twelve times the normal exposure, whilst other plates would not yield a suitable negative with more than eight times the normal exposure.

Having dealt with the question of exposure, I will now turn to the subject of the actual development of a plate, and, for the purpose of timing, either an ordinary watch, or preferably the Eikronometer invented by Mr. Watkins (which is a small clock, and can be more easily seen in the dark room, and which also practically does its own calculating), may be used. The time which elapses between the pouring on of the developer and the first appearance of the high lights of the image is carefully noted, and this time, multiplied by a suitable factor, gives the total time for development of the plate. I wish here to draw your particular attention to the multiplying factor, which is a variable one, being governed by the class, and in some cases strength of developer employed, and also upon the density of negative which suits the taste of each individual operator. In the case of pyro and amidol, the multiplying factor varies according to the quantity of each of these agents contained in each ounce of mixed developer; with the other reducing agents, the quantity per ounce does not appear to matter. Again, the quantity of bromide is of importance, for, if this be increased beyond the normal proportion of, say, half a grain per ounce, a lower factor must be taken, and this rule holds good for practically all the developing agents, metol excepted.

With regard to the alkali, provided the strength is kept within limits found reasonable in practice, and does not cause the time of appearance to be inconveniently short for observation, the actual quantity per ounce of developer does not seem to be of much importance. Ammonia is not suitable, owing to its quickly losing strength by evaporation; carbonate of soda or potash, and the caustic alkalies are practically free from this objection, and it will be found more satisfactory to use one of these. When potash is used in conjunction with pyro, it appears to have a tendency to produce density a little quicker than when soda is used, and a somewhat lower factor is desirable.

The quantity of sulphite, and the temperature of developer, if within reasonable limits, may also be ignored.

It is worthy of notice that, with most of the developers, dilution of the mixed solution does not alter the multiplying factor; but, as before stated, pyro and amidol are exceptions, for any dilution of the developer would reduce the proportion of these salts in each ounce of solution, and thereby alter the factor.

I will now give you a list of developers most generally known, with their approximate multiplying factors (taken from Mr. Watkins's book); these times may be modified to suit individual taste, but I have found them work very well:—

Pyro-soda.					
1 grain per ounce	.....	11	times the time of appearance.		
2 ,, ,,	.....	6	,,	,,	,,
3 ,, ,,	.....	5¼	,,	,,	,,
4 ,, ,,	.....	4½	,,	,,	,,
8 ,, ,,	.....	3¾	,,	,,	,,
Ilford pyro-soda, for dense negatives	.....	5	,,	,,	,,
Ilford pyro-soda, for soft negatives	.....	6½	,,	,,	,,
Hydroquinone (with caustic or carbonate of soda,				5½	times.
Eikonogen	.....			9	,,
Metol	.....			28	,,
Glycin	.....			14	,,
Amidol (2 grains per ounce)	.....			18	,,
Rodinal	.....			40	,,
Velox	.....			12	,,
Imperial pyro-metol	.....			9	,,
Metol and hydroquinone	.....			13	,,

It will be seen that those developers, which are looked upon more particularly as detail-givers, and under the influence of which the image appears more quickly, have higher factors, whilst the density-givers have lower figures.

As to practical results, I have here a few negatives which have been developed with several of the reducing agents mentioned in the above table, and, although I do not claim that they are by any means perfect examples, still, when I tell you that they have all been timed from the first appearance of the high lights, and never from the first appearance of the image looked at until fixed, I think you will agree with me that the results are very encouraging, and conclusively point to the method being a practical one. My arguments in support of it have frequently been pooh-poohed, but, the greatest tribute to its worth is the fact that one of my bitterest opponents, and a strong supporter of the tentative school, has been won over, and now times his development.

I have not tried what results can be obtained with lantern slides, but I intend to experiment in this branch, and should say that it is possible to obtain more uniform results by timing than it would be by judging the density in the ordinary way.

By the kindness of Mr. Watkins I am able to supplement my own view and portrait negatives with some test slides, which have been specially prepared to illustrate the arguments in support of his contention, although you will have noticed, from the recent developing competition, that these arguments do not appear to hold good in the case of a developer containing a very heavy proportion of pyro.

A word or two in regard to exposure meters or tables. I do not agree with those who oppose the use of these aids, as I think that most of them, especially those on the actinometer principle, are of great assistance in judging exposure, and I cannot believe that it is possible to arrive at a correct estimate by the judgment alone. I can safely say that my percentage of failures since I used these aids and timed my development has dwindled down to an insignificant amount compared with what they used to be, and my inferior results must now be attributed to carelessness in manipulation, accidental fog, uncertain hand-camera exposures, &c. You will notice that even the snap-shots, which I will pass round, have turned out exceedingly well, considering that some of them were taken in the height of summer, and others in the middle of October, all about the same time of day, with the same stop and same speed of shutter.

In conclusion, I would strongly recommend beginners, at any rate, to adopt the system, and use an exposure table or meter, and I am sure they will be glad they have taken my advice, for not only will they turn out a large percentage of good negatives, but they will not be disheartened by the repeated failures which so often fall to the lot of the novice.

W. D. Woodley.

ECONOMISING HEAT.

Although so far this winter we have not experienced particularly severe weather, methods of preventing or ameliorating an uncomfortable reduction of temperature in our studios and work rooms are worth noting, especially if they vary somewhat from the usual methods adopted. Two points have especially to be considered in all heating arrangements; they are, an even distribution of the heat, and the non-introduction of offensive products of combustion. Hot-water and steam pipes are perhaps the best, and next those stoves that heat a current of air from the outside passing through them, the gases given off from burning matter being conveyed entirely outside into the open air; and, thirdly, good gas stoves. Petroleum or oil stoves, of some makes, are very good if properly attended to and kept free from any trace of the oil on the outside, especially those parts that become heated. If imperfectly burnt gas or sulphur vapours from coal or coke are allowed to contaminate the air of rooms in which the preparation of sensitive papers or carbon tissues is carried on, dis-

astrous results may be expected. Dry plates are likewise injured, and sensitive papers even more readily, by the noxious vapours given off from unsuitable stoves and gas fittings.

Hot-water pipes have all the advantages that are required for producing heat without injury, but the cost and inconvenience of having such a system applied militates against its adoption in small places. Excellent results may be obtained with nothing more formidable than some iron gas piping and a kettle of boiling water. It is remarkable how much heat can be generated and distributed from such an arrangement; all we have to do is to fix, at about a foot from the floor of the room to be warmed, two rows, one above the other, of three-quarter-inch iron gas pipes, one end terminating in and firmly soldered to the side of a half-gallon strong tea kettle, and the other end to the upper part of it; the lid should be permanently fastened down, and a funnel, with a stem about six inches long, soldered into it, and through which the pipes are entirely filled with water, the position of the kettle should be slightly above the level of the pipes, and supported on an iron stand, over a gas burner, and this on an iron tray. The gas being lighted, the water will soon become hot and begin to circulate through the pipes, and so continue without any further attention, the waste of water being very slight, the heat given off being much in excess of what might be expected from so simple an arrangement.

Another method of heating a room is by utilising the waste heat of a gas burner, a plan I first saw used by the late Mr. R. Kennett, of Maddox-street. The room in which he prepared his plates happened to be situated over the entrance hall, which was lighted by an ordinary wall gas bracket. His idea was to obtain pure heated air without a fire or dust. This is how he managed it: A large inverted tin funnel, with a sheet-iron cover, and with a leg about two inches in diameter, the leg passing through the ceiling and floor above it, and several holes made in the hollow conical vessel thus formed. This was fixed just above the gas flame, and became strongly heated. The air entering the perforations in the sides of the funnel became heated, and passed up into the room above. Mr. Kennett told me the plan quite realised his expectations, and by protecting the exit with a gauze filter, no dust entered with the heated air, was quite sufficient for his purpose. I fancy this plan might be frequently adopted with advantage. Of course, gas is not imperative, a paraffin lamp would answer the same purpose.

In hard winters the water cistern and attached pipes have been known to freeze, and cause an immense amount of loss, trouble, and annoyance, which may be much mitigated, and, under some circumstances, entirely prevented, if a small pipe passes through the bottom of the cistern to within a few inches of the top of the water level, to the lower end of the pipe is attached a small hollow copper vessel, about the size of the ball of a ball tap of the usual kind supplied to cisterns. A gas flame kept burning below this will sufficiently warm the water to prevent freezing, unless the cistern is very much exposed to the outside air or the frost is particularly severe. It goes without saying that water pipes in exposed positions should be well protected with some good non-heat-conducting materials—old carpet, straw, &c., or, what is better, boxed in with a thick layer of sawdust or bran.

Snow can often be made to slide off the glass roof of the studio by setting alight some methylated spirit in an iron saucepan below it. By the exercise of a little care there is no danger attached to the plan.

EDWARD DUNMORE.

ACETYLENE.*

When acetylene was first rendered a commercial possibility, numbers of experiments were made in order to see if this could not be done, but the results were most discouraging, as, instead of each 1 per cent. of acetylene added to the diluting gas, giving a value of about 2 candles, it was found that it was necessary to add something like 10 to 15 per cent. before the mixture became endowed with any luminosity at all, and that, with water gas, an admixture with 20 per cent. of acetylene was necessary to give anything approaching a 20-candle gas. With a poor coal gas, however, the enrichment value of the acetylene gives better results, but still not sufficiently good to hold out any great hopes of acetylene replacing oil as a means of enrichment.

This curious phenomenon, of high illuminating value when consumed by itself being reduced so enormously when the gas was used as an enricher, led me to make a long and exhaustive series of experiments on the causes which led to it, and I have now found the reason for this apparent anomaly, and also a way in which it can be obviated. The result is that it would be perfectly easy, by a simple and rapid process, to make a fuel gas costing from 8*d.* to 1*s.* per 1000, and by the addition of 10 per cent. of acetylene to raise this to an illuminating value of about 20 candles, a result which, given cheap carbide, would open up an enormous use for acetylene gas.

* Concluded from page 41.

For use in country houses, or generally for domestic illumination, it has been proposed to dilute the acetylene by means of air, apparatus for making the mixture of acetylene and air having been tried both in this country and in America, but so wide is the explosive range of mixture of this character, that any such apparatus would be of the most highly dangerous nature, and, should any one, from want of knowledge, be willing to adopt it, I should expect that the insurance companies would firmly prevent their introduction by declining to insure buildings in which such methods of illumination were adopted. It is perfectly easy to make a mixture of acetylene and air which will burn with fine effect and a non-smoking flame, but the apparatus employed to give such a mixture is always liable to get out of order, and an alteration in the proportions in which the gases were mixed might lead to the most disastrous results. A safe method of attempting this is to make an acetylene burner in which, in the burner itself, the gas escaping through an injector shall draw in the necessary amount of air for its consumption; but all the burners that I have seen on this principle have the drawback of requiring a high pressure of gas, in order to work satisfactorily, whilst even then the results obtained from them are of a very variable character, and smoking by no means an unknown thing.

Any other diluent than air would require special apparatus for its production, and this would do away with the charm of simplicity in manufacture, which renders acetylene so well adapted for illuminating country houses. It is well known that the carbides of some metals give, on decomposition by water at a slightly elevated temperature, other hydrocarbons, and in some cases mixtures of hydrocarbons and hydrogen, and if such carbides be mixed with the calcic carbide, the heat of the decomposition of the calcic carbide by water, and the slacking of the lime produced, causes the decomposition of the other carbides present, and you get a mixture of gases evolved which can be made to approximate to the composition of coal or oil gas. Taking, for instance, the carbide of calcium and aluminium, you obtain a mixture of marsh gas and acetylene, which, whilst giving a magnificent illuminating power, can be consumed without fear of smoking, whilst, if the carbide of manganese be used instead of the carbide of aluminium for mixing with the calcic carbide, a mixture of marsh gas, hydrogen, and acetylene can be got, and possibly, when the best method of forming carbide has been obtained, it will be found preferable to use mixed carbides of this character rather than calcic carbide by itself.

PINTSCH'S GAS.

Position.	Double burner.		Single burner.	
	Gas rate, 1·8 c.f. per hour.	Pressure 1·5 inches.	Gas rate, 1·0 c.f. per hour.	Pressure 1·25 inches.
	Candle power mean of tests.	Candle power per foot.	Candle power mean of tests.	Candle power per foot.
Horizontal	18·86	10·477	8·56	8·56
5	18·86	10·477	8·56	8·56
10	18·62	10·344	8·56	8·56
15	18·06	10·03	8·51	8·51
20	17·60	9·77	8·34	8·34
25	17·46	9·70	8·26	8·26
30	17·42	9·67	8·16	8·16
35	17·40	9·66	7·94	7·94
40	17·22	9·56	7·80	7·80
45	16·04	8·90	7·54	7·54
50	15·04	8·35	7·30	7·30
55	14·08	7·8	6·96	6·96
60	13 08	7·26	6·50	6 50
65	12·22	6·79	6·04	6·04
70	11·50	6·39	5·53	5·53
75	10·0	5·55	4·96	4·96
80	9·0	5·00	4·48	4·48

Comparative experiments have been made on the utilisation of acetylene and oil gas in railway carriage illumination, and it gives for this purpose a most brilliant light, as, the source being well above the range of vision, the carriage is flooded with light without any irritation being caused to the eyes. I have travelled in a carriage lighted in this way by the Acetylene Illuminating Company, on one of our principal lines, and the ease with which the halfpenny press could be read and trains looked up in a Bradshaw throughout the whole journey, indicated that the light was amply sufficient in every part of the carriage.

For railway carriage lighting compressed oil gas, and not coal gas, is employed, and, in order to test the relative value of acetylene to this illuminant, I obtained a cylinder of Pintsch's gas, as used on the South-Eastern Railway, and consumed it in a lamp and fittings of the same character as those employed on the line. This gas, when burnt in the burner most suited for its consumption, gives an illuminating value of 52 candles or 10·4 per cubic foot of gas consumed, whilst the preceding

table gives the values obtained by burning it at a double and single burner in a carriage lantern fitted with reflector.

A cylinder of acetylene made from calcic carbide by the action of water was pumped by Messrs. Pope, and was then tested when burning from a 1 cubic foot burner, and also from a ½ cubic foot burner in Pope's lantern fitted with Thomas's reflector, the results being as follows:—

ACETYLENE GAS.

Position.	Large burner.		Small burner.	
	Gas rate 1·0 c.f. per hour.	Pressure 2·0 inches.	Gas rate 0·5 c.f. per hour.	Pressure 2·0 inches.
	Candle power mean of tests.	Candle power per foot.	Candle power mean of tests.	Candle power per foot.
Horizontal	26·0	26·0	8·6	17·2
5	26·0		8·6	17·2
10	27·0		8·6	17·2
15	27·2		8·6	17·2
20	27·6	27·6	9·08	18·16
25	27·4		9·04	18·08
30	27·1		9·00	18·00
35	26·9		9·28	18·56
40	25·9	25·9	9·08	18·16
45	25·0		8·76	17·52
50	23·0		8·54	17·08
55	21·1		8·00	16·00
60	20·1	20·1	8·00	16·00
65	18·2		7·50	15·00
70	15·65		7·30	14·60
75	14·30		6·50	13·00
80	12·20	12·20	4·50	9·00

The illuminating power of the 1 cubic foot burner was in this case only 26·0 candles on the horizontal instead of 32 as in a previous experiment with pure acetylene, and, as this loss of light seemed greater than one would expect by absorption by the glass globe, the gas was analysed and found to contain 10 per cent. of air.

This is, of course, due to the cylinder having been filled for experimental purposes, the difficulty of washing the pumps, pipes, and cylinder free from air for a single operation being very great, whereas in regular working 2 per cent. of air or other impurities would be about the limit. This being so, it seemed fairer to make a fresh sample of the gas and repeat the observations under conditions similar to those which would exist in practice.

The gas contained 97·8 per cent. of acetylene, and the results obtained with the 1 cubic foot burner in the Pope's lantern were:—

Rate of consumption ..... 1·05 cubic feet.
Pressure in inches ..... 2·0 ,, ,,

Angle.	Candle power.	Candle power per cubic foot of gas consumed.
Horizontal.	32·00	30·47
5	32 00	30·47
10	32·00	30·47
15	32 00	30·47
20	33·00	31·42
25	34 00	32 38
30	33·00	31 42
35	32·50	30·95
40	32·00	30·47
45	31·60	30 09
50	30·00	28 57
60	28·00	26 66

An ordinary railway carriage is from 5 feet to 5 feet 9 inches in width and 8 feet from door to door, whilst the flame is, as a rule, about 7 feet from the floor, the seats being from 15 to 17 inches in height, which would bring the paper or book one was trying to read as nearly as possible 3 feet from the floor. This gives an angle of from 45 to 50° as the important one for the rays which are to be utilised.

These results are also confirmed by the tests made by engineers on some of the principal lines, who find that for railway-carriage illumination acetylene is from four to five times as valuable as the oil gas usually employed, and there is no doubt that this brilliant illuminant is destined to play a most important part in our future methods of lighting.

PROFESSOR VIVIAN B. LEWES.

CELLULOID: ASSELOT'S IMPROVEMENTS IN MANUFACTURING.

MADAME EUGÉNIE ASSELOT, *née* MARTIN, of 16, Rue du Saumon, Paris, states: "Celluloid is, as is well known, largely used, but it has the great drawback of being highly inflammable, which renders its manipulation and use dangerous.

"The present invention relates to the production of non-inflammable celluloid.

"I take the ordinary celluloid and dissolve it in acetone in about the proportion of 25 grammes of celluloid to 250 grammes of acetone. I also dissolve pulverised magnesium chloride in alcohol in about the following proportion:—

"150 grammes of alcohol to 50 grammes of magnesium chloride.

"Then I mix the two solutions together so as to finally obtain a paste containing, say, 20 grammes of the magnesium chloride solution for each 100 grammes of solution of celluloid.

"The paste obtained in this manner is thoroughly mixed, and after it has been dried constitutes the non-inflammable celluloid.

"This new product possesses all the transparency, elasticity and other qualities of ordinary celluloid, and, in addition, is absolutely non-inflammable.

"In the process described I may, of course, combine magnesium chloride with other substances having the same qualities, or replace the magnesium chloride by these substances, and I may vary the proportions specified.

"The new celluloid obtained by my process can be used for all purposes for which the ordinary celluloid is used, among others, for the manufacture of artificial flowers, leaves," &c.

The claims are:—

"1. The new process of manufacturing uninflammable celluloid, consisting in dissolving celluloid in acetone and mixing the solution obtained with a solution of magnesium chloride in alcohol, the mixture of the two solutions being in about the proportion of 20 grammes of solution of magnesium chloride, containing about 30 per cent. of magnesium chloride to 100 grammes of solution of celluloid containing 10 per cent. of celluloid, and afterwards thoroughly mixing and drying the paste obtained.

"2. Non-inflammable celluloid, consisting of ordinary celluloid combined with magnesium chloride in the proportions substantially such as described."

ON THE REMOVAL OF STAINS FROM GELATINO-CHLORIDE AND BROMIDE PRINTS.

IN connexion with the vignetting of portraits and other negatives, most workers will, at some time or other, have experienced the annoyance of blemishes, which generally put in their appearance on the shielded-off portions of the paper. These may be of the well-known slug marking, or other forms of blemishes, sometimes caused by dirt on the surface of the negative, or which mysteriously puts in an appearance, the cause of which at times is not easily ascertained. In any case, these blemishes are sufficiently pronounced to necessitate the discarding of such prints, although otherwise they may prove everything that could be desired. Then, again, the edges of the vignetted shape may, owing to faulty manipulation, show too hard a line round the extremity of the shade, the softening of such outline being all that is required to improve the effect of vignetting.

No doubt, many inexperienced workers throw away needlessly large numbers of otherwise perfectly printed and toned photographs from no other cause than the presence of these blemishes, being ignorant of the *modus operandi* of getting rid of such with the utmost ease and certainty, and thereby saving many valuable prints.

A careful printer will, of course, at all times take such precautions as will avoid the necessity of having recourse to such an expedient as the removal of such stains or blemishes, for there is no doubt "prevention is better than cure" in such a case. Still a printer has a complete power in his hands for the removal from the surface of a gelatino-chloride or bromide print of such flaws, the carrying out of which is a very simple operation indeed.

In cases of prints upon gelatino-chloride paper of the Aristo class, when such blemishes put in an appearance, a worker should not hesitate to carry out the usual routine of toning and fixing his prints, even although they show very pronounced blemishes of the kind I have indicated, of which also a fruitful source is contamination of the paper from dirty fingers, &c.; and, when it has been seen to what extent such blemishes occur, after such prints are carefully washed and placed away by themselves for special treatment, a weak solution of ferricyanide of potassium and hypo should be prepared in a small cup or other vessel, by means of which any ordinary mark or blemish may be made to disappear as if by magic.

But little consideration will be needed on the part of any one having e smallest possible amount of experience in the use of this extremely luable chemical to understand that the great secret of success in the moval of such blemishes as I am considering lies in the manner in hich such a solution is applied to the print, for it will be manifest to ıy one knowing the action of ferricyanide upon a silver print that on consideration whatever must the entire print be immersed in the lution, but means must be employed whereby the image at no time ceives any application of the solution employed to remove the stains ıly.

By following closely the method of applying the previously mentioned ıemical to the faulty portions of a print which I am about to relate, ıy one can be certain of successfully accomplishing the operation, for it in reality very easily done.

Having prepared a small quantity of ferricyanide of potassium (a w ounces is sufficient), by placing a small crystal of the same in, say, couple of ounces of clean cold water, and then adding a few drachms of saturated solution of clean hypo, two or three fairly large camel's-hair ncils should be provided. The prints which have to be doctored are ow in a bath of clean cold water, and each one is separately removed ıd laid face up on the bottom of a clean empty porcelain dish of much rger dimensions than the print that is being treated. Having placed e print in the centre of the dish, dip one of the camel's-hair brushes to the ferricyanide solution, and then remove as much of the latter om the brush as is considered to overcharge it, and with the brush st moistened with the solution paint carefully over and around e blemish it is desired to remove. In a very few seconds of me the most stubborn mark will begin to show symptoms of sappearance, and eventually entirely vanish from view. By keeping e prints in the bottom of the dish, and holding the latter in a anting position, so that any of the solution attacking the surface the paper will not ascend towards the printed image, but run downards, there is no liability of the printed image suffering in the smallest gree. It sometimes happens, however, that such marks or blemishes e found in close proximity to the image, in which case the print, fore being placed in the dish, must have any surface water removed om it, an operation easily performed by sandwiching the same between e folds of a clean linen sheet; and, when the surface contains no superundant amount of moisture, and the brushes are not too heavily arged with the ferricyanide solution, the smallest speck or mark is sily removed, without any liability of the solution to spread over the inted image.

The application of this solution to the surface of a vignetted print ay very possibly leave behind it sometimes a white spot, which shows at this stage in a somewhat pronounced form upon what now appears have been a slightly degraded background, and it therefore falls to be eated so as to assume the same tone as the white spot or highest light going over the entire surface of the print (of course, avoiding the age) with a tuft of cotton-wool that has been immersed in the ferrianide solution; the entire background will immediately assume the me white appearance as the reduced portion, and not the slightest ace of a black or white speck be left apparent to the eye. After this e prints must receive a very thorough washing and be finally dried before ing mounted upon glass for the purpose of being glazed, when they ll behave as if no treatment beyond that of ordinary toning and fixing d been bestowed upon them.

In the event of a harsh outline to a vignette having to be softened, e treatment is very similar to that I have already described. A tuft cotton-wool is rapidly run along or around the outline, using the lution of ferricyanide and hypo somewhat weaker, and by rapidly ucing the print in a bath of clean water or following the cotton-wool ntaining the ferricyanide solution with another mop of cotton-wool ntaining clear water the edges of a hard outline become much softer d more pleasant to the eye.

In work of this kind all that is needed is confidence. With such, a gnetted print need never be lost from the cause indicated.

T. N. Armstrong.

Our Editorial Table.

The Practical Photographer for 1896.

London: Percy Lund, Humphries, & Co.

IE volume of our contemporary for 1896 makes an attractive book. ie matter supplies excellent reading, and the illustrations, of which there are many, are of good quality. In addition to subjects of more recent interest the historical photographic notes, with portraits of dead and gone "fathers of photography" that appear in some of the numbers, make a strong appeal to all those having photographic evolution and progress at heart. Prominence is also given to the artistic aspects of photography, and altogether this well-edited volume is creditable to those responsible for its production.

Voigtlander's Lenses: Two New Series.

Marion & Co., Soho-square, W.

Hitherto the Collinear lens of Messrs. Voigtlander has been issued in one series only, viz., Series II., having an effective working aperture of *f*-6·3. We published, in our volume for 1895, an article describing the properties of this lens; and, in the Almanac for 1897, chapter ix. of the series of articles, *Modern Photographic Lenses*, treats of the principles involved in the construction of the Collinear, and to that chapter the reader seeking for further or detailed information concerning the lens is referred.

Two new series of the Collinear have recently been introduced: Series III., with an aperture of *f*-7·7, and Series IV., working at *f*-12·5, the first-named being designed for use in hand cameras and for all kinds of outdoor work of the rapid and wide-angle kinds; while Series IV. is intended for use in copying, and the taking of interiors and general architectural subjects.

By the courtesy of Messrs. Marion, the agents for Messrs. Voigtlander, we have recently had an opportunity of practically trying one of the Series III. lenses. We chose the No. 3, which has an equivalent focus of $5\frac{7}{8}$ inches. With full aperture, *f*-7·7, the lens well covers the size of plate named, $6\frac{1}{2}\times4\frac{3}{4}$, the dimension given being under rather than over the covering capabilities of the instrument. The definition over the whole of the plate was uniformly crisp; and the correction of the lens is such that the field of the image is flat, with no traces of astigmatic error, up to the limits of its covering power. The glass employed in the lens appears to be of a high degree of purity, with an exquisite surface polish. The Series III., Collinear may be regarded as an excellent type of the modern general-purpose lens, combining great covering power with large angular aperture and flatness of field with freedom from astigmatism.

The Kodak News.

Published by the Eastman Photographic Materials Company, 115, Oxford-street.

The January number of the *Kodak News* has several readable and instructive articles, and a number of well-printed half-tone reproductions from Kodak and Bull's-eye negatives. Mr. Hepworth's article, "Some Hand-camera Notes," illustrated by capital snapshots, is excellent; and, altogether, *Kodak News* well maintains its interest and attractiveness.

News and Notes.

Royal Photographic Society.—Technical Meeting, Tuesday, January 26, at 12, Hanover-square, at 8 p.m. *Architectural Photography*, illustrated, by Mr. Ernest Marriage.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C. Wednesday next, January 27, will be the Annual Lantern and Musical Entertainment (Ladies' Night). Special tickets are issued for this evening.

The Austen-Edwards Monthly Film-negative Competition.—The prize camera for the current month has been awarded to Mr. W. B. Green, Grasmere, Gladstone-road, Watford, for his negative, *Frost and Snow Scene.*

Mr. P. R. Salmon writes: "*Jones* versus *the Members of the Linked Ring* is a capital skit, the finest I have ever read. I haven't had such a hearty laugh for years. 'Salmon' does indeed agree with Captain A. You are right there, although I dare say you were unconscious of the joke!'"

Mr. S. J. Barton, of 10, Hall Gate, Doncaster, writes: "I shall feel grateful if you will kindly inform your readers that I have opened a branch shop for the sale of photographic goods, &c., in Station-road, Doncaster, the first shop from the railway station; also that I have a spacious dark room, the free use of which I offer to amateurs, at my Hall Gate shop."

The annual supper of the employees, numbering sixty-three, of Messrs. W. Butcher & Sons, photographic apparatus manufacturers, of Blackheath, took place at the Princess of Wales Hotel, on January 14. After the supper a smoking concert was given, when a long and excellent programme was successfully carried through. During the evening the toast of prosperity to the firm was proposed, amidst much applause and musical honours, and was responded to by Mr. Frank Butcher.

New X Rays.—Professor E. Friedrich, of Elbing, Prussia, informs the Vienna Academy of Science that he has discovered some new kind of rays by which it is possible to determine definitely whether death has taken place.

Professor Friedrich maintains that these rays, which he calls "Kritikstrahlen," are so sharp that they pass through the body almost in a moment, and produce pictures on the photographic plates differing according to whether the body is dead or living.—*Daily Chronicle.*

PATENTS IN THE UNITED STATES.—The report of the Commissioner of Patents upon the business of the Patent Office for the fiscal year ended June 30, 1896, shows that there were received within that year 41,660 applications for patents, 1641 applications for designs, 84 applications for reissues, 2460 caveats, 2064 applications for trade marks, and 171 applications for labels. There were 22,791 patents granted, including reissues and designs, 1782 trade marks and 11 prints registered. The number of patents which expired was 11,466. The number of allowed applications which were by operation of law forfeited for non-payment of final fees was 4014. The total receipts were 1,307,090·3 dollars; the receipts over expenditure were 209,721·45 dollars; and the total receipts over expenditure to the credit of the Patent Office in the Treasury of the United States amounts to 4,776,479·18 dollars.

ACCORDING to *Nature*, at the meeting of the Royal Society on November 19, 1896, Mr. J. Norman Lockyer presented a preliminary report on the results obtained with the prismatic camera during the eclipse of 1896. The author first states the circumstances under which Sir George Baden-Powell, K.C.M.G., M.P., with great public spirit, conveyed an eclipse party to Novaya Zemlya in his yacht *Otaria*, to which party was attached Mr. Shackleton, one of the computers employed by the Solar Physics Committee. The prismatic camera employed, loaned from the Solar Physics Observatory, was carefully adjusted before leaving England, and a programme of exposures was drawn up based upon the experience of 1893. As the station occupied lay at some distance from the central line, this programme was reduced by Mr. Shackleton. Two of the photographs obtained are reproduced for the information of other workers, as some time must elapse before the discussion of all the results can be completed. This discussion and Mr. Shackleton's report on the local arrangements and details of work are promised in a subsequent communication. The lines photographed in the flash at the commencement of totality—happily caught by Mr. Shackleton, the wave-lengths of which lines have been measured by Dr. W. J. S. Lockyer—show interesting variations from those photographed by Mr. Fowler in the cusp during the eclipse of 1893. With the exception of the lines visible in the spectra of hydrogen and helium, and the longest lines of many of the metallic elements, considerable differences of intensity from the lines of Fraunhofer are noticeable. The coronal rings have been again photographed, and the results of 1893 have been confirmed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
25	**Camera Club**	*The Zamanap for Registering High Velocities.* Sir C. Purcell Taylor, Bart.
25	Newcastle-on-Tyne	*Enlarging.* J. A. Hodges.
25	North Middlesex	*Lincoln Cathedral.* F. H. Evans.
25	**Richmond**	*The Treatment of Figures.* Rev. F. C. Lambert, M.A.
26	Ashton-under-Lyne	*A Run through the Austrian Tyrol.* Charles Lord.
26	**Birmingham Photo. Society**	Second Annual *Conversazione.*
26	**Bournemouth**	*Pictorial Photography.* A. Horsley Hinton.
26	**Hackney**	*On the Study of Chemistry and Physics in their Relation to Photography.* J. Wilmer Cole.
26	Leigh	Prize Lantern Slides.
26	Munster	A Demonstration. Ringrose Atkins, M.D.
26	**Royal Photographic Society**	*Architectural Photography.* Ernest Marriage.
27	Borough Polytechnic	Flashlight Photography.
27	Camera Club	Testing Lantern Slides.
27	**Leeds Camera Club**	*Church Notes from Various Countries.* S. Margerison.
27	**Leytonstone**	*Oddities, Historical and Otherwise.* A. P. Wire.
27	**Photographic Club**	Annual Lantern and Musical Entertainment (Ladies' Night).
27	Stockport	A Night with the Cameras.
28	**Camera Club**	Dr. C. S. Patterson.
28	Ireland	*A Tale of Two Cities.* H. Goodwillie.—*Rambles Round the Reeks.* J. M. Keogh.
28	**Liverpool Amateur**	*From West to East of the Dinaric Alps.* John Bushby.
28	**London and Provincial**	Open Night.
28	**Oldham**	*Some Old Halls and their Surroundings.* J. Brooks and J. Chadwick.
28	West Surrey	*Instantaneous Photography.* F. O. Bynoe.
28	Woolwich Photo. Society	*Hand-camera Work.* W. Thomas.
29	Bromley	*Bromide Enlarging.* R. W. James.
29	Darwen	Prize Slides.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 19,—Photo-mechanical Meeting,—Mr. J. D. Geddes in the chair.

THE HISTORY OF THE HALF-TONE DOT.

Mr. W. GAMBLE read a paper with this title, in which, after brief mention of several processes brought forward from the earliest days of photography for producing the half-tone grain, including those of Talbot (1852), Macpherson (1852), Pretsch (1854), Berchtold (1855), Asser (1860), Pouncey (1863), J. W. Swan (1865), Reffenstein and Roesch and Placet (about 1868), he proceeded to deal with methods of breaking up the tones of the original by the interposition of a screen in making the negative plate. The credit of the screen method belonged to Fox Talbot, who, in his first patent, dated 1852, referred to the use of a glass plate, covered with fine opaque lines, or coated with an adherent fine powder. The idea was followed up by C. J. Burnett, who read a paper before the Society in 1858, in which he suggested screens of crossed or uncrossed ruled lines or random dots on glass, and Berchtold, in the next year, suggested the use of line screens for his process; but the earliest record Mr. Gamble could find of the making and use of such screens was in regard to Baron von Eggloffstein, who took out a patent in 1865, although his experiments dated from 1861, his screens being ruled with from 200 to 500 lines to the inch, the failure of his process being probably due to the extreme fineness of the ruling. Messrs. Bullock, in 1865, announced, in England, the first method of using screens in the camera in front of the sensitive plate, or in conjunction with the positive or negative when copying by transmitted light. It had also been stated that they invented the method of shifting the screen during exposure, in order to secure a crossed line; but this was also suggested by Berchtold, and, so far as available evidence went, the idea, for negative-making, should be conceded to J. W. Swan, whose patent was dated 1879, Meisenbach's patent, for practically the same thing, following three years later. The work of Woodbury was next touched upon, and then that of Mr. F. E. Ives, who, in 1886, introduced sealed, ruled, cross-lined screens, and discovered that a square diaphragm gave a better result than round ones in connexion with them, and a reference to Max Levy's invention of engraved line screens (1893) concluded the historical portion of the paper. Turning to theoretical considerations, which were very exhaustively discussed, Mr. Gamble deduced the following propositions: (1) That, in making a half-tone negative, the holes of the screen are little windows allowing a part of the picture to pass through equal to their size; but (2) that, when the exposure is prolonged and the screen hole small, the latter also acts as a pinhole lens and photographs the light spot of the diaphragm, the image of which blackens over the little square of picture; but, if the latter happens to be a part of the shadows, it stops the illumination of the pinhole image, and little or no action takes place. (3) That the screen hole, acting as a pinhole, must photograph the shape of the spot of light, and render it as image. (4) The pinhole image is not a sharply defined outline of the diaphragm, because the pinhole does not see the diaphragm as a sharply defined image, but sees all the corners rounded off by diffraction; a small aperture is so much encroached upon by the diffraction rings and fringes that it looks smaller than it is, and, when it is transmitted through the screen, further diffraction fringes make it smaller still, so that the image becomes smaller than the screen opening. And (5) diffraction thus overcomes any obstructive action of shadow and penumbra, giving sharply defined images, even though the diaphragm be large and the screen distance considerable.

Mr. T. BOLAS could not help thinking that the best way of dealing with the diffraction question would be to make some definite measurements for the purpose of determining the amount of the diffractive effect. There would not be the least difficulty in determining what was due to diffraction and what was due to penumbra.

Mr. W. E. DEBENHAM had always held that the essential characteristic of the dot might be traced to penumbra, an opinion which was supported by Dr. Eder. Mr. Gamble had said that, on the penumbral theory, it was impossible to see why the dot in the shadows should be smaller than the opening in the screen, but he (the speaker) thought this was perfectly explained by that theory. If an opening in the screen were placed at a suitable distance with respect to the size and distance of the diaphragm, the centre of that opening received all the light coming through the diaphragm, but the light grew less and less towards the margins, and the light from the shadows of the original would be so feeble that only in the centre would there be a spot strong enough to form a dot. It was also stated in the paper that the best images had been produced at that distance at which diffraction was greatest. He would like to be informed what that distance was, and to be furnished with other data necessary for investigating the point.

Mr. CHAPMAN JONES thought Mr. Debenham had rather exaggerated the case in the diagram which he drew to illustrate his remarks, and pointed out that there ought to be both penumbra and diffraction, and the question to decide was which was the more active in a particular case.

Mr. GAMBLE said he had been making a great many experiments on this point, which were not yet complete, but on a future occasion he would bring forward absolute proof of the theory which he had enunciated.

Mr. CHAPMAN JONES said that, unless there were a very large difference between the extent of the penumbra and the extent of the diffraction, it would not be easy to distinguish between them under practical conditions.

Messrs. PERKINS and DAWSON also took part in a prolonged discussion upon the paper, and, after some remarks by the CHAIRMAN,

Mr. GAMBLE briefly replied, stating that he got most diffraction with a screen distance of about a quarter of an inch, and got nearer Dr. Eder's results by placing the screen closer, about an eighth of an inch.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 14,—Mr. W. D. Welford in the chair.

Mr. RAPSON, referring to staining by gold toning, asked the cause of a certain amount of tinting that had taken place on a print which had been toned, fixed, and washed. The print had been subjected to all kinds of weather on the studio wall, and, though there was no apparent fading, it had a decidedly darker tone in the parts unprotected from the light.

Mr. A. HADDON said it would be interesting to tone and fix an unexposed piece of paper and submit it to light in the same way, to see if light acted upon the white paper and produced a tint as shown. It might be due to a combination of the gold with the gelatine.

The HON. SECRETARY showed a piece of a daily paper which, originally white, had darkened on the side exposed in a shop window.

Mr. E. J. WALL remarked that, if the paper had been made white with

ultramarine in its manufacture, it would be liable to decomposition by light and change colour.

Mr. T. E. H. BULLEN gave a practical demonstration of the use of the new

TRANSPARENT FILMS.

After referring to his recent paper on *The History of Film Photography*, he said it was his intention to describe the new film about to be placed upon the market, and styled the A.C. film, on account of the total absence of celluloid in its manufacture. It was a very difficult matter to provide a transparent support for the emulsion to replace glass, and a problem not easy to solve, though it looked very easy. To make gelatine insoluble was a simple matter, but to render it impervious to water was another thing. To compete with celluloid, it is necessary to have a film impervious to water, and the use of collodion and cellulose as a basis is debarred by their cost, and from the fact that water is readily absorbed by the latter. The film under examination is prepared from gelatine, and in such a manner that would stand all the manipulations attaching to development with strong alkalies, washing of the negative, and, moreover, would remain quite flat throughout. It was stated also that a given emulsion was more sensitive on these films than when coated upon glass. There was practically no halation in its use, it was as transparent as glass, and required no support of any kind. So far as he could say, there should be no chemical action between the film and the sensitive silver salts. Mr. Bullen proceeded to develop a number of exposures on these films by the H. & D. standard ferrous-oxalate developer. The great thing was to moisten the film with water before development, and it was stated that they were no more difficult to manage than glass plates. After fixing and washing, a bath of glycerine, quarter ounce to twenty ounces of water, should be used, and the films hung up by pins and dried without heat. Owing to the unfavourable weather of late, Mr. Bullen had been compelled to fall back for examples to a large extent on transparencies from which to obtain some negatives. Further, the batch of films available was a rapid one for negative work, and Mr. Bullen remarked on the far from simple task of reproducing negatives from transparencies by means of rapid emulsions. However, he passed round a number of negatives and prints from the same. He also showed some negatives taken at one o'clock that same day, which would show they stood a fair amount of rough treatment, as, to accelerate the drying, they were treated with spirit and dried over a steam pipe. They were almost sufficiently rigid in the quarter-plate size for exposure without carriers, but he had used carriers himself.

Mr. BANKS, in reply to a question by Mr. Haddon, said there was no formic acid or formaline used in their manufacture.

In the discussion a number of points were raised.

Mr. BULLEN, replying to Mr. Hodd as to whether they would stand on edge when it was wished to develop them so, said it was unusual, but they could be held by the carriers used for celluloid films if desired. The films could be made to suit high temperatures in hot climates. The speed would be similar to the other plates; with ferrous oxalate, about 125 H. & D., or, with the more speedy developers, 250 H. & D. The difference in speed between the glass and film would be perceptible, but not great, but the freedom from halation was marked. They had no tendency to stick together in the solutions, and considerable numbers could be done together.

Mr. WALL proposed a vote of thanks, and suggested that, instead of being called the A.C. film, it should be styled the Gemini, on account of its double coating.

PHOTOGRAPHIC CLUB.

JANUARY 13,—Mr. R. P. Drage in the chair.

Mr. HANA showed some negatives taken with Maloni's flashlight. He said he thought it was a practicable apparatus, and likely to prove of use, although some provision was required for carrying off the smoke.

Captain M. HORACE HAYES, F.R.C.V.S., a member of the Club, presented the second edition of his book, entitled *Points of the Horse*. One of the main interests in this book to photographers is that the illustrations are largely done from original negatives taken by the author. Captain Hayes gave an interesting description of some of his pictures, which, he said, represented truthfully the actual work of both horse and van, and were not, as is sometimes the case, merely "posed" for taking a photograph. He stated that the majority of the pictures are made with an N. & G. hand camera and Celeritas shutter, working at one two-hundred-and-fiftieth of a second.

Mr. Welford showed a copy of the diploma given by the Hamburg Exhibition, which was of entirely novel character.

Mr. Tottem showed an enlargement from a quarter-plate negative taken by Mr. Alfred Craske, and entitled, *Please, Sir, Some one Stole my Clothes*. Visitors to the Exhibition of the Royal Photographic Society may have noticed this interesting picture, of which the enlargement is a very excellent reproduction.

Mr. Stretton showed an interesting photograph of a medical subject.

Mr. WELFORD referred to certain statements which had been made upon the subject of blocked-out lantern slides, which had recently been claimed as novelties. He now passed round some slides made on wet collodion in the year 1871, which were blocked out in the manner alluded to. It was evident that amateurs at that time used the method; professional slide-makers had been using the method for a great many years.

Mr. FOXLEE drew attention to a paper which had been read before the Club on the subject of testing photographic mounts. The paper was published in THE BRITISH JOURNAL OF PHOTOGRAPHY of November 9, 1888. He had found the tests which he made for the purpose of writing the paper referred to, and he thought the members would be interested in seeing them. The photographs which had been experimented upon did not appear to have altered much, if at all, from the day on which he last saw them, eight years ago. The tests were passed round for the members' inspection, and were examined with a good deal of interest.

A discussion ensued upon the subject of mounts generally, and it was pointed out that, at the period referred to, two or three legal disputes arose, which turned upon the quality of the mounts supplied.

A series of members' slides, contributed by Messrs. Welford, Frank Haes, and Fry, were then passed through the lantern.

Croydon Camera Club.—The twenty-ninth public show of lantern slides at the Braithwaite Hall, on the 13th inst., drew a large audience, numbers being unable to obtain admission. The proceedings opened with a well-received set by Mr. A. Underhill, several of his Windsor studies being particularly acceptable. A new recruit—Mr. J. C. Taylor—contributed specially interesting subjects, including the wrecked piers at Brighton, Motor Car Day at Purley, and some capital racing yachts. Perhaps most original and effective was, however, his *Young Sea Gull*. Mr. Kough showed some motor-car snap-shots, which were capital when it is remembered that so bad was the motor-car parade day, that a special press photographer who was sent down to Croydon by a leading London paper could not get anything at all on his plates. Mr. Paul Martin's prize medal set of twelve slides—*London by Gaslight*—followed, and evoked exceedingly warm encomiums. They were, indeed, so original and withal so charming, that it was no wonder they quite captivated the audience. Pointing at one of the scenes, "Who could guess that this was prosaic Clapham?" exclaimed the President (Mr. Hector Maclean), who filled the dual *rôles* of Chairman and spokesman. Mr. A. BELLIN, who is always a welcome visitor, next gave a short chat, illustrated by a graphic and telling collection of snap-shots mainly taken on the marble hills of Northern Italy. It was hard to say whether his pleasant anecdotal and learned descriptions or his photographs took the palm; any how, when the PRESIDENT proposed him the Club's thanks, and hoped on some future occasion Mr. Bellin would spend, not part but the whole of, an evening in relating his incidents of travel, the large audience most unmistakably endorsed the President's invitation.

ANOTHER KINEMATOGRAPH.

The photographic portion of the entertainment concluded with the display of ten scenes shown by means of Messrs. Bender & Co.'s grand kinematograph. These photographs, which, counting positive and negative, numbered 24,000, were taken by a member of the Club, Mr. Adolphe Langfier, who had intended explaining them, but, prevented by illness, the duty was, at the last moment, undertaken by the President of the Club. Although, in consequence of an accident, the improved kinematograph was not available, the mimicking of motion exhibited on a twenty-foot screen seemed to be most heartily enjoyed by the assemblage, which on several occasions expressed their feelings by a perfect storm of applause, particularly acceptable being *Demolition of Old Railway Station, Croydon*, and *Yacht Landing Pleasure Party, Hastings*. At intervals during the evening a team of banjoists, under the direction of Miss Cumbers, performed a welcome programme of songs, choruses and *ensembles*. His Worship the MAYOR OF CROYDON (Mr. Martin Luther Moss) said he had followed Mr. Bellin's remarks and pictures with very considerable pleasure and interest, inasmuch as several of the scenes portrayed had been quite recently visited by himself; he could therefore bear witness to the admirable truthfulness of representation present in Mr. Bellin's pictures. This might seem superfluous praise, but, when it is remembered that photography is capable of taking portraits that no one can recognise, it was well to testify to photography's occasional truthfulness.

Hackney Photographic Society.—January 12, Mr. E. Puttock presiding.—A lecture, entitled

SOME POINTS IN THE COMPOSITION OF A PICTURE,

was given by Mr. W. RAWLINGS, in which he defined composition as such an arrangement of the various objects of which a picture consisted, both relatively to each other and with respect to the whole, that each and every element should most efficiently contribute to the perfection of the general design. Every restriction and disability under which the photographer worked made it more imperative for him to master all that related to his art. With the painter, his first consideration was his power of correctly delineating form; and, secondly, the composition or appropriate arrangement of those forms. With the photographer, his first and only consideration, apart from the chemical and manipulative skill necessary, was his knowledge of composition, for his camera drew correctly for him, or approximately so. Every picture should have a distinct and dominant subject, and should not consist of a collection of unrelated things of about equal unimportance. Simplicity in the choice of a subject led to a much larger percentage of successes. In attempting a wide range of scenery, great attention should be paid to the composition of the foreground, which should be thoroughly characteristic of the kind of country, and the distance might take care of itself. This method would suggest the true spirit of the scene more effectively than a direct attack on the wide prospect. The main subject should occupy the strongest point in the picture, which was usually *near* the centre, but not *at* the centre. When there was a second subject, the dominant interest must be placed more at the side. The essential element of all beauty was variety with unity. The masses—whether of subject, or light and shade—should be unequal in quantity and form. There should be as great variety in the direction of the lines as possible, and as little repetition of exact forms and curves as was consistent with the unity of the subject. Too great an amount of variety would destroy the harmony of the design. Two of the main difficulties against which all picture-makers had to contend were, first, the flat surface of the paper on which the picture was made; and, second, the four right lines which formed the artificial limits of the picture. It was the function of good composition to minimise these. Thus the main features of a picture should not be directly over each other, nor horizontally level, for they would actually, or by suggestion, repeat the artificial limits, which should be concealed rather than revealed. No important lines should start from the centre. The value of figures and other definite objects introduced into the foreground, with a view of expressing space and distance and of breaking up obtrusive lines, was fully illustrated by means of a number of sketches, photographs, and other pictures, and the equal necessity of good composition in the *sky* was insisted on.

Leytonstone Camera Club.—January 13, the President (Dr. Turner) in the chair.—Mr. A. HORSLEY HINTON (Vice-President of the Club) gave his lecture on

PICTORIAL PHOTOGRAPHY,

the details of which have so often appeared in the photographic press; in the discussion which followed varying views were expressed concerning the claims of the technical *versus* the artistic production, the lecturer said there was room for both, it was just as necessary for the illustrative side of photography (perhaps more so) as the artistic, he appeared before them as an exponent of that part of photography that most interested him, and that there was a field open for those who were of the same opinion. In answer to a question of the suppression of detail, the works of Meissonnier and Birket Foster being cited as full of detail, the lecturer said that there was not a hundredth part of the detail contained in either of these gentlemen's works compared with the sharply focussed detail of the photographic lens. In the number of examples he had brought down, the various points, advantages and comparisons were explained.

North Middlesex Photographic Society.—January 11, Annual General Meeting, Mr. Mummery (the President) in the chair.—Mr. SMITH (the Treasurer) presented the balance-sheet. Although there was no cash balance in hand, the Society was in a very satisfactory state, as a considerable sum had lately been expended in lantern requisites, and the assets, including the library, were of considerable value. Mr. F. L. PITHER read the report of the Outing Committee, and Mr. COX (the Librarian) gave a very satisfactory account of the library. He acknowledged various gifts of books and money from members, the latter being expended on the purchase of more books. The library now consisted of 160 works, and the appreciation in which the library is held is shown by the fact that 135 books have been borrowed during the year. Mr. MUMMERY then read his annual report, which showed that the Society was holding its own. Although there had been numerous resignations during the year, the new members admitted quite made up the loss, there being now over eighty members. The election of officers for the year then took place, resulting as follows:—*President:* Mr. J. C. S. Mummery.—*Vice-Presidents:* Messrs. W. B. Goodwin and E. R. Mattocks.—*Council:* Messrs. J. Addison, A. J. Golding, C. O. Gregory, A. J. Johnson, A. H. Lisett, J. Mackintosh, J. W. Marchant, J. A. Meen, C. R. Steele, H. Stuart, and J. L. Treadway.—*Librarian:* Mr. F. W. Cox.—*Treasurer:* Mr. H. Smith.—*Secretary:* Mr. W. Taylor, 38, Palace-road, Hornsey, N.—*Assistant-Secretary and Curator:* Mr. W. J. Simpson.

Polytechnic Photographic Society.—The Committee have arranged for the meetings to take place on Thursdays in Room 14, 309, Regent-street, which, from date, will be our Club room. We have also arranged that on Enlargement Nights the demonstrations will take place with members' negatives if they give due notice. The fixtures for February contain such well-known names as Messrs. Howard Farmer, Wolfgang Arndt, T. E. Freshwater, Gear, Tarrant, and A. H. White. Thursday, January 28, is our Lantern Night. Those who cannot be present are requested to send their slides to Mr. F. Parker, who will look after them. Visitors are invited to this meeting.

Putney Photographic Society.—January 14, Mr. H. Faulkner in the chair. Mr. C. H. Davis, assisted by Mr. G. Ardaseer, of the Richmond Camera Club, gave a demonstration on

ENLARGING BY ARTIFICIAL LIGHT.

The lecturer began by giving some account of different methods of enlarging without the aid of condensers. The negative is placed in a suitable frame and the image focussed on the easel placed some distance off, a frame about the same size as the negative having suspended from it several strips of magnesium ribbon is placed some distance behind the negative and the ribbon ignited, the exposure being regulated by a greater or less number of strips. Another method is to use one long piece of ribbon and pass it backwards and forwards behind the negative so that each part receives an equal amount of light. Both these methods give very fair results, but certainly not such good results as are obtained by the use of a large condenser to converge the light into the focussing lens, the negative being placed close to the condenser and between it and the focussing lens. The lecturer then proceeded to explain in detail the enlarging apparatus (Hume's Cantilever) he had brought with him, using gas in an incandescent burner as the illuminant. The negatives most suitable for bromide enlarging were briefly described, but it was pointed out, and demonstrated later, that very fair prints may be obtained from any negative by suitable exposure and development, short exposure and dull light for very thin negatives, long exposure and bright light for dense negatives. The methods of printing clouds from a separate negative were also described, Mr. Davis preferring a cut-out mask pinned on to the print. Some exposures were then made on 12×10 bromide paper from quarter-plate negatives, one of the negatives being a very thin one and the other a dense one, the resulting prints being very good, though, as Mr. Davis pointed out, it is always more difficult to obtain good results in a lecture than in one's own dark room. A hearty vote of thanks to Messrs. Davis and Ardaseer for their interesting paper brought the proceedings to a close.

Richmond Camera Club.—January 11.—Mr. CEMBRANO (the President) gave a very interesting address on the subject of

PLATES AND PAPERS.

He enumerated the principal varieties in the market, and touched upon the salient features of each. A good discussion followed.

Bath Photographic Society.—January 8.—The first item was a display on the screen of fifty selected lantern slides belonging to the Society, illustrating Bath as it was and as it is. Mr. E. J. APPLEBY gave the description, and spoke of the value of such a collection, which he mentioned as available for the use of other societies. The Rev. E. A. PURVIS next entertained the audience with a lucid description of an improved enlarging lantern, in which incandescent gas is used. Two enlargements were made, having an exposure of one minute each; they were developed with metol, and, despite the difficulty attending such a demonstration, the results were highly satisfactory. During the interval for tea the company inspected the exhibition of members' work arranged around the walls and on the tables. Each contributor's work was, as far as possible, grouped in series, and amongst them we noticed the following:—The Chairman, Mrs. Shaw Phillips, Mr. E. J. Appleby, Mr. L. T. Knight, Mr. W. Rowley, Mr. W. Rossiter, Mr. H. P. Clifford, Mr. A. B. Fortt, and the Rev. E. A. Purvis. Framed enlargements and other works bore the names of Colonel Sealy, Mr. Rossiter, and Mr. A. F. Perren (Bath views). Stereoscopes and stereographs were exhibited by Mr. Austin J. King, Mr. E. J. Appleby, Mr. Rowley, and the Hon. Secretary. Albums of views, &c., were shown by Mr. Appleby and Mr. Sommerville, and Colonel Sealy showed a frame containing about forty choice transparencies. After the inspection the CHAIRMAN gave an account of recent Convention meetings, about fifty lantern slides from his own negatives being used to illustrate his remarks. The programme concluded with a further exhibition of selected lantern slides, chiefly illustrative of places visited at the summer excursions. These numbered upwards of eighty, and were contributed by the Chairman, Mrs. Shaw Phillips, Colonel Sealy, Mr. W. P. Dickson, Mr. W. Rowley, and the Hon. Secretary. The Photographic Society's lantern was employed throughout the evening, and manipulated by the Hon. Secretary, Mr. W. Middleton-Ashman.

Birmingham Photographic Society.—The Annual Meeting of the above Society was held last week under the presidency of Sir BENJAMIN STONE, M.P. In moving the adoption of the annual report, he referred to the general progress of the Society and the excellent work that had been done, as evinced by the annual Exhibition. The thanks of the Society were due to the helpers, who gave lectures, &c.; to the Secretary, and to the Council, for keeping the Society up to the standard of excellence it had attained. It was no small standard of excellence they required, for he looked upon the Birmingham Society as one of the best and foremost in the photographic world. Touching on the class of work, he said there was a conflict of opinion as to whether photographs should be considered art productions. That was a question which he was inclined to think should rather rest with the eye that looked upon the photographs than with the hands that produced them. Art was the embodiment of poetry and romance; science was the embodiment of truth. Photography was the servant of science, and, if they logically followed that out, they had truth, as being the highest aim of photographic work. On the other hand, he could quite sympathise with the man who, having artistic taste, availed himself of the thousand-and-one little variations of production and chemical results that art produced with hazy mystery, and which went out of the bounds of strict truth into those of poetry and romance. He thought they would agree to accept all works as being satisfactory if admirers could be found to approve of them. For himself, he had always taken the highest value of photography to be the means of recording what was actually in existence and what might pass away, and he did not agree with any complaints that one district was more highly favoured than another in respect of subjects, because the smallest matters around them were in all probability worthy of recording. In this country we had not a distinct museum for ethnological subjects illustrating the actual examples and mode of life, particularly in the lower classes, right through the long history of England. Many of the old articles of domestic economy used in our old manor houses and cottages were fast disappearing in our advanced age, and the only way of preserving a record of these outside a museum was by means of photography. He recommended them, therefore, if they came across any such articles, even although it was an old wooden platter or an old square plate, such as was once in use, to photograph it, and have it put upon record. Nothing around them was beneath their work. Mr. C. H. BARNSLEY seconded the motion, and the report was adopted, as was also the financial statement, which showed a balance in hand of 30*l*. Mr. JONES, in moving a vote of thanks to and re-election of the President, said Sir Benjamin Stone had given much advice and spent a great deal of time and money for the benefit of the Society. Mr. G. THOMASON, in seconding, thought something should be done towards making the advantages of the Society better known. The Society had turned out many successful photographers, whose only instruction was what they obtained in these rooms. Sir BENJAMIN STONE, in acknowledging, said he was indebted to the Society for a great deal of the knowledge and skill he possessed. The Vice-Presidents and other officers were also thanked, and the following were elected for the ensuing year:—*Hon. Librarian:* Mr. W. S. Horton.—*Hon. Treasurer:* Mr. E. J. Penn.—*Hon. Secretary:* Mr. C. J. Fowler.—*Assistant Hon. Secretary:* Mr. F. Lewis, with four Vice-Presidents and eight members of Council.

Bradford Photographic Society.—Mr. A. P. Rendell (Vice-President) occupied the chair during the early part of the meeting, and Mr. Oliver Nicholson during the latter part. The second half of the session commenced with what was termed "Grumblers' and Nomination Night." A large number of questions were asked and answered, and the members had a good opportunity of airing their grievances, and the Press criticisms on the Exhibition at the Art Gallery came in for a good share of comment. An unusually large number of nominations for officers and committee were handed in to the Secretary (Mr. P. Wilkinson), and these will be balloted for at the annual meeting. The whole of the officers and committee retire, but are eligible for re-election, and no doubt the competition will be very keen.

MR. W. T. WILKINSON (Wakefield) gave an address on *Paper Negatives*, which he illustrated with a large number of paper negatives and prints. A number of questions were answered by Mr. Wilkinson, to whom was accorded a hearty vote of thanks, on the motion of Mr. G. Swain, seconded by Mr. D. Stevenson. Mr. W. Harmsworth occupied the chair, and there was a large attendance of members.

FORTHCOMING EXHIBITIONS.

1897.

January ..... Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

February 1–27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.
,, 8–13 ..... Photographic Society of Ireland. Hon. Secretary, Victor E. Smyth, 35, Dawson-street, Dublin.
,, 25–27 ..... Woolwich Photographic Society. Hon. Secretary, F. W, Machen, 161, Griffin-road, Plumstead, S.E.
March 6–13 ..... South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Patent News.

THE following applications for Patents were made between January 4 and January 9, 1897 :—

INCANDESCENT LIGHT.—No. 160. "The Limelight Incandescent Mantle." W. J. HOLME.

GLASS PANELS FOR PHOTOGRAPHS.—No. 180. "Improvements in Decoration of Plate or Sheet Glass for Use in General House Decoration and for Furniture Panels, Overmantels, Fire Screens, Finger Plates, Photograph Frames, and all other Decorative Purposes." H. NORRIS.

CINEMATOGRAPHY.—No. 212. "Improvements in Intermittently Moving Apparatus for Taking or Displaying Photographs." Complete specification. P. GAUTIER.

CINEMATOGRAPHY.—No. 413. "Improvements in Apparatus for Taking and Projecting Successive Photographic Pictures." C. STAFFORD-NOBLE.

LANTERNS.—No. 449. "Improvements in connexion with Projecting Lanterns." Complete specification. W. C. HUGHES.

ARC LAMPS.—No. 454. "Improvements in or relating to Electric Arc Lamps for Photographic or other Purposes Regulated by Hand." G. DOWIE.

OPTICAL ILLUSIONS.—No. 638. "An Improved Device for the Production of Optical Illusions." C. D. SLATER.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—It seems to me that there are some points in connexion with the action of Captain Abney and of Mr. Chapman Jones, as well as that of the Council of the Royal Photographic Society, upon which misconception is likely to exist.

There appears to be an assumption that the Council "wished" for such a change in the Articles of Association as might involve the exclusion of some whom the members would, whilst at liberty to do so, elect to serve on the Council.

As a member of Council, I do not propose to make public its proceedings, as has unfortunately been done more than once; but I think it may reasonably be inferred that a sufficient majority in favour of placing the proposition before the members (which is all that the Council can do) might be made up by including those who felt under some such obligation in consequence of the action of the Chairman at the meeting held in December, 1895, without taking it for granted that they wished for the change to be actually made.

With regard to the proposed change itself, to which I and others object quite as strongly as Captain Abney and Mr. Chapman Jones, the proposition (not a new one) is that, to ensure the introduction of "new blood" into the Council, five members, not having served in the previous year, must be declared to be elected, to the exclusion, if need be, of such senior members as by the voting papers would be chosen.

To the introduction of new members to the Council, in whatever proportion the members at large may show by their votes they desire, no one has raised any objection. When, however, it is proposed to take away from the members the liberty of choosing those whom they deem most capable of serving the interests of the Society, I think that those who propose such a course should show in what way it would be likely to improve the constitution of the governing body as it has existed since the incorporation of the Society.

An argument that has been used in favour of the change is that there are members who have an ambition to be on the Council, and who would be stimulated to activity and usefulness by the propect of their election being enhanced.

The view that the object of the Council, or even one important object, is to afford a certain amount of prominence and importance to persons who would not otherwise attain distinction, seems to be radically wrong. The object of the Council should be the furtherance of the interests of the Society and of photography, and experience has not shown that those who are most anxious to put themselves forward for office are those who are capable of rendering the most useful services. A more laudable ambition is that of being of service to photography. Success in this field may naturally lead to distinction in connexion with the Society, and otherwise.

The fact that a meeting was held, at which a majority were in favour of the change, does not by any means show that it would be in accordance with the wishes of the members generally. The 'ambitious' members in whose interest the proposal has been claimed to be made would naturally attend, whilst members generally, especially country members, could not be expected to make a journey for a purpose not strictly photographic.

The honour of being on the Council is one which some of the senior members would willingly lay aside, together with its obligations, but that they feel themselves bound in some sort by the wishes of the members as expressed in their voting papers.

It should not be forgotten that, by the rules as they are at present, the nominations *must* be at least five in excess of the number to be elected, and, in fact, are always in much greater excess, whilst, from natural causes, deaths, resignations, and choice of new men, there are actually four or five new members on each successive Council.—I am, yours, &c.,

W. E. DEBENHAM.

"THE SOUL OF TRADE."

To the EDITORS.

GENTLEMEN,—I enclose you a copy of an advertisement offering to do "a three-quarter life size enlargement" which shall be "absolutely permanent," and of the finest finish with the air brush," all for six shillings and sixpence.

You, sir, have several times called attention to these men, who heap up fortunes out of the brains of our profession, and it seems most incredible that photographers generally should so long rest content to see their works copied by any Dick, Tom, or Harry, who thinks he can make a penny out of them.

I am aware that the question is a difficult one, but surely there is a "way out."

To register every negative would, of course, be out of the question, on account of the expense, and I would venture to suggest that strenuous efforts should be made by the profession to secure an amendment of the law of copyright, and so obtain some form of general protection. For instance, let every professional photographer pay an annual fee which shall render all photographs taken by him "copyright" as long as he continues such payments.

This suggestion may be considered impracticable and even ridiculous by some, but I shall be satisfied if some of our leaders will take the matter up, and bring it to a successful issue, viz., the establishment of some effective form of photographic protection, for, when a publisher of note speaks of making 5000 enlargements "at present," and anticipates 100,000 in the near future, this must be pirating the moral, if not legal, rights of our profession.

We have only to look into almost any magazine or newspaper to find that the instance I have given enclosed is only one of many, and I certainly think that we have thought of it long enough, and should now act.—I am, yours, &c., JOHN WICKENS.

Upper Bangor.

To the EDITORS.

GENTLEMEN,—The letters which you published in your issue of January 15, under the above heading, only show to what extent cheap photographers will go to to get hold of the "needful."

I doubt whether the public who patronise these cheap firms really get any advantage by so doing; but I do know that the real sufferers are the assistants, who have to receive a starvation wage to enable their employers to offer the result of their labour at the following cutting prices: one cabinet and six *cartes-de-visite* for 2*s.* 6*d.*; twelve *cartes-de-visite*, 2*s.* 6*d.*; or twelve midgets, 1*s.*

The above prices are charged by a firm with a large number of branches.

These cutting prices, along with those mentioned by your correspondents, I am sure have not come to stay, for I am told that the 2*s.* 6*d.* and 1*s.* midgets trade is not by any means flourishing; in fact, the cutting firms are not doing half the trade they have done. Perhaps the public can see how this class of work is produced, *i.e.*, by sweating.

Some little time back a London firm issued inserts in a weekly paper (*Home Notes*), offering a beautiful enlargement, framed, size 38 × 23, for 12*s.* 6*d.* Can it be wondered at, after reading the above, why some photographers cannot pay their rent, to say nothing of taxes, &c.?

In the old wet-plate days there were no twelve *cartes-de-visite* for 2*s.* 6*d.* or twelve midgets for 1*s.*, and nothing was heard of such a thing as bullying and sweating of assistants. Why now? Ah, why?

Trusting you will find space for this letter in your valuable paper,—I am, yours, &c., AN OLD WET-PLATE PHOTOGRAPHER.

London, January 15, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

RECEIVED. — SEKAON; ALDINE; AMIENS; ALBUMEN; LOCOMOTION; RETOUCHER; ANDERSON BROTHERS. In our next.

A. MANDERS.—Probably your best plan will be to write Messrs. Sharp & Hitchmough, Dale-street, Liverpool.

ELEPHANT BRAND OF COLLODIO-CHLORIDE PAPER.—E. H. T. asks for the names of the makers of this paper. Will some reader supply the information?

LENS.—R. WESTON. From the description, the lens is the triplet, a very good form of lens, though somewhat slow. It was a favourite instrument till the rectilinear form, which superseded it, was introduced.

PHILIP PARSONS.—We believe it to be a genuine concern, but, if the goods are not soon forthcoming, we should recommend you to apply pressure in the shape of a threat to place the matter in the hands of the local police.

GEM PORTRAITS.—T. ROSEN. Cameras and lenses for gem and stamp portraits are supplied by most of the dealers in photographic goods. Several make a speciality of them. Consult the advertisement columns of the ALMANAC.

STICKY INDIARUBBER CLOTH.—NEMO. Evidently the rubber is perishing. The only thing we can suggest is to rub it over with French chalk, and keep it well chalked. That will, in a measure, prevent its sticking in the folds.

STEREOSCOPIC TRANSPARENCIES.—E. S. D. Mr. H. N. King, of 4, Avenue Villas, Goldhawk-road, Shepherd's Bush, and Messrs. A. Seaman & Son, Chesterfield, supply stereoscopic transparencies. Write them for their list of subjects.

SUSPECTED MOUNTS.—H. C. We have no means of forming a definite opinion as to whether the mounts are the cause of the fading or not without submitting them to tentative testing. We should say, however, that they are not, as we strongly suspect that the prints were imperfectly fixed.

MARKED NEGATIVES.—W. W. H. If the "smearlike" marks can be seen on the plates before they are exposed, it is clear that they are not due to the manipulation. Have you called your employer's attention to the fact? If so, he should not blame you, but the makers of the plates.

PATENT.—T. W. H. If you know the number and year of the patent, you can obtain the full specification of it, with the provisional application, at the Patent Office, for 8*d.*; or it will be sent to you, post free, if you apply for it on Patents Form C 1, which can be bought at any post-office for 8*d.*

NITRATE OF SILVER.—OLD HAND says: "I have about twenty ounces of nitrate of silver that is possibly a dozen years old. Do you think it would do, without some treatment, for sensitising paper with, as the crystals are much discoloured?"—The silver will do quite well for the purpose as it is.

PHOTOGRAPHING IRONWORK.—R. MOORE. If there are no bright parts, but simply the iron as it was wrought or came from the moulds, there is no necessity for coating or painting it with anything prior to photographing it. If there were any bright or polished portions, as with machinery, it would be different.

SWEATING LANTERN SLIDES.—T. WARDELL. The cause of the "sweating" when the slides are in the lantern is moisture in the atmosphere condensing on the cold glass. The trouble may be avoided by keeping the slides near the fire for some time before they are required to be shown, so that they become slightly warm, then the moisture will not condense upon them.

WASHING PRINTS.—P. F. L. S. asks: "Could you tell me if there is any danger of damaging gelatino-chloride prints by washing them before toning, after toning, and after fixing; the trays are entirely wood, including the bottoms. Of course, a different tray is used, after fixing, to that used before and after toning?"—In reply: No, the only danger to be apprehended is from either insufficient or too prolonged washing.

ANASTIGMATIC LENSES.—S. WILTON writes: "It is said that the new Jena glass has put a new power in the hands of opticians; but of what use is it to any but wealthy professionals or gentlemen amateurs? The price charged by opticians for the new lenses is simply prohibitive to any but those who have long purses. Is there any reason why such heavy prices should be charged for these lenses?"—Of course, manufacturers can charge what prices they like for their goods; but you must bear in mind that high skill is required in the construction of the lenses, and that must be paid for.

SENSITISING PAPER.—W. BELL asks how professional photographers sensitise their paper. He says the text-books say, Bend the paper in a bow, and then gently lower the two ends; but, when he follows these directions, he gets air bubbles on the front and the silver solution on the back, and he feels sure they have some better method than that.—That is the way the majority of professionals work. Some, however, place one end of the paper first on the solution, and then gently lower the remainder. The thing is so simple that it is difficult to see how any one can fail. A little careful practice will overcome the difficulty.

COPYRIGHT.—G. H. says: "I am asked to copy a number of photographs, some of which, I fancy, must be copyright. How can I ascertain that, as I do not want to get myself into trouble?"—The only way to learn is to search the register at Stationers' Hall.

COPYRIGHT.—J. WICKENS says: "I shall be very glad if you can give me in your next issue an answer to the following question: I recently secured a very fine photograph of a pack of hounds, the property of a local nobleman. A London artist (?) came down to his Lordship's residence on some other business and saw my picture, praised it, and eventually had a copy presented to him; in a few weeks he comes down again, and brings an oil painting, very indifferently executed, but *a copy of my picture*, and sells it for 30*l.* You will understand that was entirely a "spec." My photograph was duly registered. Can I sue for damages?"—In reply: Yes; the copyright of the original photograph appears to be yours, and you can therefore sue for and obtain damages. Place the matter in your solicitor's hands *at once*.

BROKEN NEGATIVE.—CRACKED NEGATIVE asks: "Will you please give me, through your Correspondence column, a good method of stripping a cracked negative, and transferring it on to another glass. I have a negative, which is of great value to me, and, while printing from it, got cracked, and I should like to transfer it to another support without stretching it?"—In reply: First soak the negative in a solution of alum or one of formaldehyde, wash and dry. Next immerse the negative in water to which a few drops per ounce of hydrofluoric acid have been added; this will detach the film from the glass, and it can then be floated off on to another glass. This glass should previously have been coated with a weak solution of plain gelatine and dried. If, when the film is detached, it is found to have expanded, it may be brought back to its original dimension by immersing it in methylated alcohol.

RETICULATED CARBON PRINTS.—CARBON asks: "Will you kindly let me know, through your Correspondence column, what is the cause of frilling of carbon prints, single transfer, and how to know the strength of an old bichromate sensitising bath?"—Yours is about the worst example of reticulation we have seen for some years. Reticulation may be due to more than one cause. Some samples of gelatine, if used for the tissue, and that is dried too quickly after sensitising, will produce reticulation. The use of too hot water in the development will cause it. The use of a transfer paper which is not sufficiently insoluble will also bring it about. Is our correspondent sure that he has not used double transfer paper instead of single transfer paper? The prints sent look very much as if he had. If there is any doubt about the strength of the sensitising bath, it is better, as the bichromate is cheap, to throw it away and make fresh. The sensitising bath does not get weaker by use like a silver bath.

SULPHOCYANIDE OF AMMONIUM.—C. J. WYNNE writes: "Would you kindly help me in the following? I have an ounce bottle of ammonia sulphocyanide, and find that, after some time, it got partly into a fluid state, which, of course, cannot be weighed in grains, as required. Could you tell me: 1. What quantity of water should be dissolved in the ounce? 2. What quantity of the dissolved solution should be used for a thirty-two-ounce bath, with two and a half grains of gold?"—1. If the contents of the bottle be dissolved, as if it were the ounce of solid sulphocyanide, a solution of definite strength will be obtained; but, as the salt has suffered some deterioration in deliquescing, it will be better not to use it. As the sulphocyanide is an inexpensive salt, we should advise fresh to be obtained, and then, at once, be dissolved in a definite quantity of water, say sixty grains to the ounce, in which state it will keep for a long time without decomposition. 2. The following is the usual toning bath: Sulphocyanide, 30 grains; water, 16 ounces; chloride of gold, 2 grains.

OBSTRUCTING LIGHT.—R. W. E. writes: "Can you give me any information on this subject? Ten years ago I built a studio on my back premises, and have carried on business in it ever since. Now my next-door neighbour is extending his premises in such a way that they will block out all my side light and a good deal of the top as well, in fact render the studio quite useless. I am friendly with him, and he says he is sorry, but his business needs the increased premises and he can get them no other way—nor can he, but it means next to ruin to me. Several have told me that, as my building has had an unobstructed light for more than seven years, I can prevent the erection, others say I cannot. I have consulted a solicitor in the town, and he tells me I can apply for an injunction to restrain the building. Do you know of any case of its being done?"—Your solicitor is quite right, you can apply for an injunction, and he might have told you, if he knew, that there was not the slightest possibility of its being granted. You must enjoy an uninterrupted light for twenty years before you are entitled to "Ancient lights." You have no redress, though it is hard upon you.

GLAZING STUDIO.—STUDIO says: "I am building a studio, the side light of which overlooks the garden of my neighbour. He has given me an agreement, saying he will not interfere with my side light, on the understanding that I use ground or opaque glass of some sort. 1. Which is the best form of glass to use, ordinary ground glass or rolled plate glass? 2. Will the latter admit as much light as the former? or is there a special opaque glass made for glazing studios? If so, where is it to be obtained? 3. Would it be better to glaze roof of studio with plain glass or opaque? There are nearly fifty yards between side light and nearest building, consequently plenty of light. 4. The size of studio is fifty feet by fourteen feet. I am glazing twenty feet. Will that be sufficient to ensure a good light?"—In reply: 1. The ground glass, if kept clean, will admit more light than the other. 2. Fluted glass, which is supplied by all glass merchants, is what we should prefer to the others. While not opaque, nothing can be distinguished through it, and it stops out little or no light. 3. Twenty feet will be ample, and we should recommend plain glass for the purpose.

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No. 1917. Vol. XLIV.—JANUARY 29, 1897.

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EX CATHEDRÂ.

In the outer pages of this week's Journal is published the prospectus of the Thornton-Pickard Manufacturing Company, Limited, Altrincham, near Manchester. The share capital is 60,000*l.*, divided into 20,000 five per cent. cumulative preference shares of 1*l.* each, and 40,000 ordinary shares of 1*l.* each. The whole of the ordinary shares are taken by the vendors in part payment of purchase money, the 20,000 cumulative preference shares being offered for public subscription. The list of applications opens on February 2, and closes on February 4.

* * *

The managing directors are Mr. J. E. Thornton and Mr. Edgar Pickard, Mr. G. A. Pickard and Mr. J. W. Berra also having seats on the Board. The Company acquires admirably equipped works, the patent rights of the well-known Thornton-Pickard specialities, stock in trade, machinery, book debts, &c., valued at 17,847*l.* 15*s.* 3*d.* For the year ending November 30, 1896, the profits on the business are certified to have been 8343*l.* 4*s.* 9*d.*

The vendors, Mr. J. E. Thornton and Mr. Edgar Pickard, who have been identified with the business since its establishment nine years ago, have agreed to act as managing directors for a minimum period of five years. They retain the whole of the ordinary shares, and pay the expenses of forming the Company. For further particulars relating to the Company we refer our readers to the prospectus. The Company are also issuing a well-got-up portfolio, giving an illustrated description of the works.

* * *

The professional photographer who succeeds in pleasing all his sitters must be both a fortunate and a clever man. His failures to do so are so many bad advertisements for him, which preserve their ill effects for long periods. The fractious or the chronically displeased sitter is a great power for evil in a photographer's business, but we devoutly hope that our professional readers are seldom, if ever, blessed with the patronage of individuals resembling one of whom we lately heard. This gentleman sat, some two years or more ago, to a photographer for his portrait. The account was several times rendered without payment being obtained. At last pressure in the shape of a threat was resorted to. This elicited from the sitter—who, we were informed, was a newspaper editor—a letter, in which he stated that the portrait was not a good likeness, and he strongly objected to pay for it. Was it worth while, therefore, for the photographer, by pressing for payment of his account, to run the risk of the editor of such-and-such a paper commenting upon the unsatisfactory quality of the photographer's productions? Our informant placed this letter in the hands of his legal adviser, with what result we have not heard.

* * *

Several questions relating to infringement of copyright that have lately been addressed to us, in which, so far as we could perceive, our correspondents possessed clear chances of recovering handsome penalties, remind us of an incident that recently occurred, and the moral of which may be useful to photographers owning copyright photographs, as well as to those who may be tempted, through ignorance of the copyright law or other causes, to pirate those photographs. A friend of ours, on his way home one evening, saw on a hoarding a large coloured reproduction of one of his copyright photographs. The printers were communicated with. They

pleaded ignorance of the copyright law, but they were given three hours to decide whether they would permit an injunction to be applied for or come to terms; they chose the latter course, paid a heavy sum of money, consented to the confiscation of some thousands of the prints, and so matters terminated. The moral for the photographer is that he should keep his eyes open, as wholesale piracy is the order of the day, for, unlike the printseller, he has no representative body which lays itself open to detect cases of piracy or infringement. During the last year or two we have ourselves been the means of drawing photographers' attention to reproductions of their photographs in illustrated magazines which have turned out to be infringements of copyright; in this respect photographers might possibly often be of use to one another.

NOVELTIES IN PHOTOGRAPHS.

Our always entertaining and up-to-date contemporary, *La Nature*, recently published an article which is suggestive enough to form a suitable text for some observations of a practical character. The cry of the professional photographer, and his lack of business, has been very loud for some time past, so that a description of anything, with however limited a scope, that offers a novel opening for his work will be accorded a hearing. The writer of the article, M. Albert Bergeret, comments on the especially French custom of sending each new year a visiting card to everybody one knows, far and near, and even to those one does not know, but who have started the game by first paying us a similar compliment. Every year, says the bewildered writer, we make a resolution to abandon the practice, but each succeeding year sees it in full force again. It is rather droll to see our familiar *carte-de-visite* used in this connexion; but, like many other gallicisms introduced into our language, the meaning we attach to the borrowed words has no warrant from the original. The French visiting card is a *carte-de-visite*, our English *carte-de-visite* is a *portrait-visite*. M. Bergeret writes: "Some strange souls have thought it would be more logical to exchange one's portraits rather than an ordinary visiting card, and have created the portrait card called '*portrait-visite*,' but the practice has received no support among us."

Here is room for a business suggestion at once. We know that some photographers strain every nerve towards Christmas time to get work out and to encourage among their clients the very practice upon which our writer throws such cold water, and we feel sure that, if all over the country a concerted effort were made by photographers to direct public-feeling in that channel, the time would not be far distant when the already discounted pretty-picture style of Christmas greetings would be largely ousted in favour of photographic portraiture, with or without special seasonable mounting. We have seen advertisements in provincial newspapers drawing public attention this way that have been dated actually some months before the time. There is by this plan the double advantage of having sufficient time to be able to produce high-class work, which is impossible when done in haste against time, and of securing orders in advance, and to that extent cutting the feet from under the Christmas-card manufacturer. The photographer's usual argument is: "If, as seems to be the case, Christmas cards must be sent, let them take the form of a photographic portrait, which every one has suitable means for storing or framing; while with the usual prettinesses they are too good to burn, there is nowhere to put them, and a special drawer is wasted by being put to storage purposes. It is not every one, of course, who cares to send his own or his children's portrait year by year—though our readers will, no doubt, agree that such a practice would be excellent—hence we may see much value in another of the ideas M. Bergeret's paper suggests. It appears that of late years the French Postal authorities, appreciating the desire of the public to send with their complimentary cards a few words of seasonable greeting, permit free "written or printed words, in the third person, to be added to the sender's name, without extra postage being charged." But even these polite formulæ or wishes make us no more in love with the existing card, that every one abuses and sends the next time. What, then, can be done to make it into a pleasure that we cannot suppress? *To illustrate them by photography.*

Here is at once the germ of an idea, with money in it, to the enterprising. Examples showing how it can be carried out are given in the lively paper. In the first illustration we have a picture, less than quarter-plate size, of a locomotive, with driver and fireman looking out, with the legend in bold figures, "The Rapid, 1897, with our good wishes."

In another picture we have a street view, with a couple of sandwich men. One in the distance carries a board marked "Adieu, 1896." He in front says, "Health and Happiness to our Readers, 1897." M. Bergeret describes a card he receives as a view of a duel to the death. Time has killed 1895, and a little baby in a perambulator—"1896"—appears in its place. The last appearance of his ingenious friend who sent him these New-year's cards is seated on an automotor car, "1897." A word to the wise, we are told on an ancient authority, is enough, and we are sure that those of our readers who care to take up the idea we have described will need no help on our part in the way of suggesting schemes and motives for a large variety of such cards suitable for 1898. To those unfamiliar with the details of the wholesale trade in such articles, we can say it is not one moment too soon if work is started at once for cards for 1898; indeed, it is late rather than early, for the travellers will be abroad among the stationers and others early next summer, booking orders from samples for goods to be delivered in this year's early autumn. One of our readers has informed us that he sold to a publisher of almanacs nearly two years ago a series of photographs for reproduction, of which, so far, only one has been used; the others are being reserved for the 1898 season. In conclusion, we will only say we hope these hints of ours may so fructify that the stationers may, for the 1898 season, have among their stock a fair proportion of seasonable greetings, in which photographs play the principal *rôle*.

Copyright Prosecution.—Last week we alluded to a prosecution for piracy in which the defendant was mulct in penalty and costs to the tune of between thirty and forty pounds. Since then, one, Henry Burrell, appeared at the Mansion House to five summonses, and pleaded guilty to infringement of the Copyright Act. He was ordered to pay five shillings costs on each summons. He was thus leniently dealt with, as he had given the source whence he had obtained the piracies, and was the principal witness against the one in the case referred to; also, that his evidence would be of essential importance in a case of civil proceedings that is pending against the person previously fined. A great number of people do not seem to be aware that damages may be recovered in a civil action, as well as penalties in a police-court. The punishment of pirates, when detected, is severe—but still there are pirates.

The Late Cardiff Exhibition.—It will be remembered that, at the time this Exhibition was inaugurated, there was a somewhat acrimonious discussion in our columns as to how the right of photographing in the Exhibition had been dispensed. Evidently, the show, as a whole, was not the commercial success that many anticipated, as there is a considerable deficit. It has just been announced that there is to be a call of 1*s.* 9*d.* in the pound to be made upon the guarantors. The guarantee fund was 30,000*l.* It was a good provincial show, and it is to regretted that it did not clear its cost.

Photographing Snakes.—At the meeting of the Zoological Society last week, the Secretary, Mr. P. L. Slater, F.R.S., exhibited a series of photographs taken by Mr. R. W. Nesbit, showing the mode of feeding the rough-keeled snake. The reptile lives on the eggs of birds; the egg does not, however, pass into the stomach, but only into the gullet, where the shell is pierced on each side by the spineous processes of the vertebræ. By the muscular contractions of the reptile, the yolk and white are squeezed out, and then the shell, still held together by the lining membrane, is pressed flat and ejected by the mouth. These interesting photographs were shown at the Photographic Club a little while back, and were very curious, as the egg, a pigeon's, is much larger in diameter than the snake in its normal condition, and the pictures showed, in series, very clearly the different stages of the feeding—from the first swallowing of the egg to the ejection of the shell. Mr. R. W. Nesbit is a son of Mr. John Nesbit, a well-known amateur, and an authority on the collodion-emulsion process.

X Rays: Another "Latest."—The Röntgen rays have frequently been successfully utilised by surgeons for discovering the actual location of things lodged in the throat; but, till now, we have not heard of their being used for preventing such mishaps; such, however, appears to have been the case. A paragraph has been going the round of the lay press, and given with all seriousness, to the effect that a lady at Sunderland, in making some cakes, lost her ring in the paste, and did not miss it till the cakes were out of the oven. Being afraid that some member of the family might be choked, "she struck on the happy expedient of taking the cakes to a chemist and photographer, who placed them under the X rays, with the result that the ring was immediately located." A few months back we mentioned that it was stated, at an inquest on a child who had died through swallowing a coin, that at one of the London hospitals the X rays were not used because the mother could not afford the fee of 5*s.* for the rays. It would be interesting to know what the Sunderland chemist and photographer charged for the X-ray work, and the value of the cakes; then one could better see the *value* of Röntgen's discovery when applied to finding lost rings in cakes.

Winter Weather at Last.—A good many photographers, amateurs more particularly, have been lamenting that there has been no opportunity for obtaining pictures of winter effects. During the last week, however, there has been no cause for complaint on that score, and there is now no excuse for not securing all that can be wished for in that direction. But no time should be lost in securing what is desired, for, at the time of writing, although the weather is very severe, and there is a good coating of snow in all parts of the country, there is no saying how long it may last. Just now there are flocks of gulls to be seen on the Thames, and some good winter pictures, including them, are to be had from the Embankment, and in the neighbourhood of the bridges, when the light is fairly good. The conditions for securing them are, of course, quick plates, and a lens that can be worked with a large aperture, as well as the courage to face the elements when the thermometer is something below freezing point. A few weeks back we, in a leading article, put the query, "Are we prepared for winter?" and gave several reminders of what may profitably be done by professionals, and how inconvenience pertaining to severe weather might be averted. We hope the hints given have proved of service.

A Novelty (?).—It is really amusing to note the number of patents that have, from time to time, been taken out for colouring photographs from the back. In no other country, probably, would so many patents for the same thing have been possible. Here the Patent Office simply accepts the fees, asks no questions, and grants the patents. Even as early as 1852 a patent was granted for colouring photographs from the back, and another the following year, and we should not care to speculate as to the number since. This system of colouring has also been vended as "secret processes" under different names, and good sums have been realised by teaching the methods; in some instances, we are sorry to say, by holding out the prospect that good incomes were to be realised by practising the "art" as a profession.

The latest patent in connexion with this subject is dated November 4, 1896, the specification of which was published last Saturday. As the specification is short, we give it in full:—

"My invention has for its object the preparation of photographs previously mounted on glass or other transparent material, so that the same may be coloured with oils, water colours, or otherwise, from the back. The method I employ for this purpose consists in rubbing the back of the photograph with the finger, or a piece of linen, or other soft material, after the same has been mounted on the glass or other material, and before it has become quite dry, and thereby effecting the removal of a layer of the paper, which becomes detached in rolls. After the photograph has been allowed to dry, the paper is again rubbed with the finger and a piece of linen or other soft material, previously moistened with water, until sufficient of the paper has been removed to render the photograph sufficiently transparent for colouring applied to the back to show through. The photograph may then be painted with oils, water colours, or otherwise coloured as desired, and then a backing of paper, wood, metal, or other material applied. Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. The method of preparing photographs so that they may be coloured from the back, substantially as described. 2. Photographs prepared and coloured, substantially as described."

Any comment on this patent, which, by the way, is taken by a lady, would be superfluous.

AMERICAN NOTES AND NEWS.

A Veteran's Advice.—Mr. Bogardus, in the *St. Louis and Canadian Photographer*, has a useful word or two of advice to professional photographers. While the business world is anticipating improvement along all lines, he says, why should not photography share in the prosperity? Photography is the first to feel the effect of empty purses, and is generally the last to recover; yet, when money comes easy, it is likely to go easy. Make work that will induce people to invest. Photography is now a necessity. The growing children must be pictured; the old must be 'taken' for the gratification of the whole progeny, and those in middle life must secure their best looks before time brings wrinkles and the crow's foot. It is not pride (of course not), yet they feel that it is just as well to have them in their prime. A dozen good pictures well circulated are the photographer's best advertisement. Recipients are expected to return the compliment. Every dozen should bring at least six new patrons. Be ready with the brand-new accessories and the 'latest' in mounts, and by the time the leaves drop in the fall you will turn your key at night a proud and successful man.

Photography under Difficulty.—In the same journal, Mr. Champortin, writing from Honduras, alludes feelingly to some of the difficulties he has to encounter through climatic vagaries. Our first difficulty, he says, comes from thundering Jove and old Boreas let loose on us from his misty cave. For eight months in the year rain pours down in torrents each succeeding night. Although it is seldom that Apollo fails to lead his brilliant chariot along the ecliptic and scatter before him Nimbus and the other gods of the storm, still the moisture is so great that it is next to impossible to keep dry plates dry. Place a little sodium chloride in a saucer, and the next day you have a saucer of salt water. Pyrogallic acid, unless well bottled and sealed, will not keep two weeks. In a word, with an atmosphere saturated with moisture, it requires the greatest

care to preserve any chemicals whatsoever. Stock solutions do not keep for any length of time. Then comes the difficulty of the dark room. There is no house here impermeable to light. I have one of the best houses in Punta Gorda, still I find it impossible to keep rain out of my house; and where rain will penetrate daylight will not escape. To the amateur the old reliable bath-room is often a very convenient dark room, but our bath-room here is the open sea. Consequently, our only chance of developing a negative is to wait until the distant screech of the owl has announced that nature is once more at rest under the shades of night. Then comes the difficulty of water. Every photographer knows that he who spares the hydrant spoils the negative. But I hear you say, dear madam, 'How can water be scarce amidst those torrential rains which hardly skip a night during eight consecutive months of the year?' Our tanks are small, like the angels' visits, 'few and far between.' Not many of Punta Gorda possess the luxury of a tank.

Conventional Backgrounds.—"Thomas Aquinas," in *Wilson's Magazine*, has a timely protest against conventionality of design in studio backgrounds. As far as my observation goes, he says, the background evils perpetuated by photographers are largely due to a too slavish following and use of the conventional designs furnished by the manufacturers of grounds. Because a ground is painted by this or that 'famous artist' is not sufficient excuse for its use except where it is appropriate to the pictorial scheme of the picture in which it is introduced; every subject requires its own individual setting when perfection is sought, and this proper setting can only rarely be obtained in a background 'ready-made.' Thus it happens that, in the studios of those whose work has won the approval of art critics, we find comparatively few 'ready-made' grounds, the ground required in each picture being made up according to the requirements of the subject. If photographers would only 'get down' to this simplicity in their choice and use of grounds, they would not only make better and more pleasing pictures, but would also save considerably in their outlay for background equipment.

Glycin and Metol for Bromide Development.—Mr. John Bartlett gives, in *Wilson*, the following formula for this purpose. Non-liability to fog and better control over the gradation are claimed by Mr. Bartlett for the mixed developer of metol and glycin instead of metol alone. Mr. Bartlett says: "I make the following solutions:—

A.

Glycin	75 grains.
Metol	10 „
Sulphite of soda	3½ ounces.
Carbonate of potassium	3½ „
Water	40 „

Also a second solution:—

B.

Glycin	40 grains.
Metol	8 „
Sulphite of soda	600 „
Water	16 ounces.

You will notice that the latter (B) contains no carbonate of potassium. It is employed to increase the density. I first subject the print to the action of Solution A, and, if it progresses in development gradually and grows in intensity in a minute or so, I allow it to continue in the developer; but, if indications are shown that it needs more density—that is, is lagging somewhat—I add a measure of Solution B as a stimulant. However, do not be too precipitate in expediting the evolution, and so probably spoil your picture. If there is evidence of over-timing, dilute with water and a few drops of bromide; but I imagine the print is always softer for the omission. If you think you have rather undertimed your print, take one measure of A, one half measure of B, one half measure of water.

The "Unphotographic Photograph."—Mr. E. Lee Ferguson has in the *Photographic Times* a forcible defence of the unphotographic photograph. The unphotographic photograph, he points out, is not new. Its supporters have always made noble efforts in its behalf, but it has been swept to one side by the deluge of photographic work that is undeniably purely photographic and mechanical. These pictures, that may cause an artist a thrill of delight, will arouse antagonism among many who appear to fancy that some one is attempting to get beyond the fixed scope of photography. Whether photography is an art is of little value to discuss. It is a method, and the point to consider is whether the result is artistic. To say of this result that it resembles an engraving or an etching is a poor form of commendation. Quantities of mediocre—and worse—engravings and etchings may be found with ease. Engraving, painting, etching, photography—all are methods of producing something that may or may not have artistic qualities. When a picture produced by photographic methods bears the impress of the artist's individuality, satisfies the eye, and appeals to the imagination, too many endeavour to hide the method, and praise it for a fancied resemblance to another form of work, considered—properly or improperly—of a high order. So it is that the highest form of photography becomes, to the general mind, unphotographic.

Imitation Red-chalk Drawings.—*Anthony's Bulletin* for January contains some beautifully reproduced portrait studies by prominent American photographers, one of whom, *apropos* of a portrait that is included in the number, gives the following method of producing imitation red-chalk drawings:—Take a piece of ground glass, the same size as the negative, place it in the plate holder, and focus. The subject must now keep the body still until the exposure is made. Take a piece of crayon, and sketch the copy on the ground glass. Now insert the plate in the holder, replace the latter on the camera, vignette (with a vignetter on front of the lens), the head and collar, make the exposure, and close the plate holder. Then focus on a piece of rough canvas, and expose the same plate on this canvas and develop. Print on Aristo-platino paper and tone only with gold, enough to clear the whites. Fix well, and the resulting print will have the appearance of a red-chalk drawing.

THE COLOUR OF EMULSION FILMS AND RIPENING: AMMONIA IN GELATINE EMULSION.

I.

It would not be at all difficult to prove the correctness of the words expressed in your leading article of last week with regard to the connexion between coarseness, colour, and sensitiveness in emulsion, or emulsion films, or that sensitiveness is not necessarily dependent upon either of those physical conditions, although in a general way, and to a certain extent, they accompany it. But the real "ripening," or acquisition of sensitiveness would rather seem, as you suggest, to consist in some kind of gradual combination of the silver bromide with the gelatine or collodion, a view which, according to more than one authority quoted by Herr Liesegang in the article published last week, finds favour with those who have given the matter study.

That coarseness and blueness of the bromide by transmitted light almost invariably accompany sensitiveness when obtained by the methods in general use, whether based upon the application of heat or the use of ammonia, is not to be denied; but it is equally certain that, when, as is occasionally the case, a more than ordinary degree of rapidity is obtained without these accompaniments, the quality of the preparation is infinitely enhanced, and you are, no doubt, correct in describing the effects referred to as necessary but unavoidable evils.

It is perhaps more in connexion with collodion emulsion than with gelatine that the effect of change of colour and coarseness can be studied both as regards sensitiveness and quality of image. Bromide of silver suspended in collodion is susceptible of precisely the same physical changes under similar conditions as in gelatine, or it may be said to undergo those changes far more readily; but with this difference, that sensitiveness does not always accompany the change; and, when it does, the quality of the result is invariably depreciated.

The application of heat to a collodion emulsion in order to increase its sensitiveness is not as easy or as safe an operation as it is with gelatine, but it is on record that Mr. Warnerke has boiled such an emulsion "in a strong bottle" without arriving at anything like the exalted rapidity obtainable with gelatine. At the same time, heat does greatly increase the sensitiveness, but at the expense of quality, for the image obtained, although clean and quite free from fog, will not intensify by any known means.

Ammonia too, added to a collodion emulsion, will, to a certain extent, increase its rapidity; but this advantage is confined within very narro

uits, since, by its action on the pyroxyline, the suspending power of collodion is quickly destroyed, and the bromide deposited in a perfectly granular and useless condition. If the ammonia be so applied that the precipitation is gradual, and the degree of coarseness not great, and the precipitate be collected and re-emulsified in fresh collodion, it will be found that the sensitiveness is not as great as before the addition of the ammonia to the emulsion, showing very conclusively that something more than mere mechanical effect is involved in the ripening process.

W. B. Bolton.

STRIPPING GELATINO CHLORIDE PRINTS FOR VARIOUS PURPOSES.

Introductory Remarks.*

The method of making lantern slides and transparencies, P.O.P. transpictures on opal, wood, plaques, lamp shades, &c., given here, depends upon the possibility of stripping the films of glossy gelatine printing-out papers. I find Ilford P.O.P. best suited for this purpose, though other makes may be used. It is similar to the carbon process in the method of working as far as it goes, but the ease and certainty with which a picture can be made on a print-out paper will recommend my method to all for above purposes, while its cheapness is an additional nature in its favour. Any one who can make a print can work it with absolute certainty by the aid of the simple directions herein given, and can obtain the many and varied advantages of carbon in the direction above indicated without the trouble and difficulty attending the use of the latter, especially in India and the colonies. In England, where unsensitised carbon tissue can be got from the makers as required, it is easier to work, but, abroad, the tissue must be bought unsensitised. It is exceedingly difficult to keep the tissue in good condition, and no dealers in this country, as far as I am aware, stock it, so it must be procured direct from England—a troublesome business to workers on a small scale. The advantages of P.O.P. in this respect are obvious. Then, the operation of sensitising carbon tissue is always an uncertain one in the hands of beginners—uncertain in this way, that, if your bath varies at all, then your exposures and results vary too, often involving loss of tissue and time, although you may have already taken prints from the same negatives. It is a beautiful process, and the results are beyond suspicion as regards permanency, but it is pretty well out of the reach of small workers in India, there being no firms who supply small quantities of sensitised tissue. With P.O.P., again, there is no washing out, or, properly speaking, development of the image. The film is stripped in its entirety, and stands considerably rougher handling than does the carbon image. This is another advantage for most amateurs. As to the general results, it will cost you little to satisfy yourself.

Negatives with strong contrasts give the best results. This does not mean negatives with chalky whites, and shadows without detail. It would be better to say *vigorous* negatives. Nor is it to be understood that thin negatives are useless. The latter, by careful printing in the shade, may be made to yield excellent results. It is necessary, in order to get vigour, to very considerably over-print, so any print that has gone too far for ordinary purposes may be reserved for treatment by this method. A few trials will show how far it is necessary to go, but as a guide it may be noted that the printing should be carried on till the whites are darkened and shadows bronzed Negatives with *very* intense contrasts should be printed in the sun and not carried to the extent of darkening the highest lights. It will be found that prints from negatives of the latter class will look softer and more presentable when transferred than when on their original support.

I strongly recommend the separate bath for toning and fixing as given by the Ilford Company. Where the combined bath is used, the stripping preparation should be used after finishing and thorough washing, while the printing should be carried to the same depth as indicated above. At present it does not seem possible to get slides by this method sufficiently vigorous for the limelight lantern, but they seem to be quite enough so for the ordinary oil lantern. Probably the chief value of the method lies in its application to transfer work. A new use is here found for negatives in transferring to opal, plaques, wood panels, &c., for wall decoration.

* This method was originally devised for use with a special preparation of mine, originally made for general use with P.O.P. in hot weather. The same applies, however, exactly to the use of a formalin bath of about two per cent.; and in describing the method the references to the "antifoudre" bath should be replaced by others to "formalin bath." As there are slight variations in the formalin, it is better to ascertain the proper length of time of immersion by a simple trial. This is very easily done by soaking waste prints for varying lengths of time and afterwards squeegeeing, &c., as directed. H. H.

Preparing the Prints.

Having finished your printing, see that your washing dishes are scrupulously clean. Wash in several changes till the last water shows no milkiness on adding a little solution of common salt. To test it, take a little of the last washing water in a glass vessel or tumbler and add the salt solution. If it remains clear, all is ready for the bath, which is to confer the power of stripping the film. Take

Stripping powder ("antifoudre")	2 ounces.
Water (boiled)	10 ,,

The water may be added when cold or while hot.

When the powder is dissolved and the solution cooled, filter through paper or fine cloth, and proceed to immerse the prints one by one. Keep moving, and do not have too many in the bath at one time. Keep each batch in the bath for twenty minutes. To economise time, a larger bath may be used, and a larger number of prints immersed at a time. The object is to prevent the prints sticking together, and thus causing unequal action upon the film. After passing through this bath, wash till the water shows no action on blue litmus paper, that is, does not turn it red. The prints are then ready for toning, and will have a tough, leathery feel to the touch. Tone to any colour that may be wished in the usual way, remembering that, as transparencies or lantern slides, the colour will appear slightly warmer than if left on the original support, while, if they are to be transferred to opal or other solid body, the colour will be about the same as it would be on the paper.

When the prints are finished and dried carefully, trim them to the exact size they are to be when on their final support. The edges must be perfectly clean-cut and square, as it is not possible to afterwards rectify errors in this respect.

It is not necessary to dry the prints before proceeding to transfer them to their final support, but doing so gives the opportunity of better trimming the edges and squaring them. If time be an object, they may, after the final washing, be blotted off between blotting-paper of good smooth quality, or, better, the blotting board, specially prepared for such purposes. They may then be dried before a fire or over a stove.

It will be evident that gelatine prints may invariably be treated in this way, even though not to be stripped, and may be squeegeed to glass, cleaned and rubbed over with matt. When perfectly dry, they will strip of their own accord. This may be hurried by drying near a fire. The surface of prints treated by this process may be washed if they get soiled.

Gelatine prints sometimes show black specks which appear at various stages of their preparation. They may be due to impurities in the water, or dirty dishes. As a wrinkle to workers of these papers, these specks may more often than not be removed by gently rubbing with a sponge *filled with water*. Place them on a sheet of glass after final washing and while yet wet, and rub gently with a circular motion till the specks are removed. If the prints have been treated with my preparation, there is no fear of abrading the surface provided you work lightly.

Transferring the Prints to Glass for Lantern Slides and Transparencies.

For this purpose the glass plates should be specially prepared. It is not absolutely necessary, but a better job is done, and there is no risk of the transferred film slipping out of place. The following solution should be made up:—

Gelatine	180 grains.
Water	10 ounces.
Bichromate potash, enough to give a deep sherry colour.	

Soak the gelatine in the water for a couple of hours in a clean glass or earthenware jar, then place the jar in hot water and stir the gelatine solution till dissolved. Dissolve a little bichromate in half an ounce of hot water, and then add it to the gelatine till colour is attained, stirring while doing so. When thoroughly mixed and filtered through cotton-wool, it is ready for use in coating the glass plates that are to receive the film on transfer from the paper. You may use old negative glasses from which the film has been removed by soaking in weak solution of nitric acid. In this case the glass must be free from scratches and perfectly clean, For lantern slides it is better perhaps in all respects to buy the cover glasses sold for lantern slides. In any case, all glass should have a bath of weak nitric acid, and, after washing, be polished with soft cambric cloth. To coat the plates, if you do not possess a pneumatic holder, take a plate in the hand so that the shortest side of it is next your body, one corner of the plate resting against the fleshy part of the thumb, the remaining fingers being spread out under the plate, the tips

only touching. Pour on a pool of the filtered gelatine solution at the corner diagonally opposite the thumb, and tilt the plate just sufficient to cause the solution to flow slowly over it, and pour off the surplus into an empty clean bottle from the right-hand corner nearest the body. The solution, when poured on, may be led round the plate with the middle finger of the right hand. Rock the plate as the surplus is poured off, and, when drained, put into a rack and go on with the others. When all are coated, put them out in the sun for an hour or two, which will render the film insoluble.

They are now ready for receiving the prints. Pour clean water through a muslin strainer into a clean dish, which latter should be large if you would save time. Put into the dish as many of the coated plates as it will hold, coated side up. Into another dish put your prints. While these soak, place a clean, smooth cloth or towel on the table beside the dishes, also a piece of thin rubber cloth and a flat rubber squeegee (procurable from your dealer). Take up a print, place it face down over one of the prepared plates in the other dish, lift the plate and print together, centre the print on the plate, drain off surplus water, and place the plate, with the print adhering, upon the cloth, the print uppermost. Lay the rubber cloth over the print, with the left hand pressed upon one end to prevent it moving, the rubber squeegee in the right hand. Place the edge of the squeegee on the sheet of rubber near the left hand, and draw it with a steady scraping motion to the other extremity of the plate, using a gentle, even pressure. This drives out the water from between the print and glass plate. Turn the plate round and repeat the squeegeeing from the opposite end. Turn it over, and see that the print is in perfect contact with the plate. If any air remains between, it will be noticeable from small silvery-looking patches. It is well before applying the squeegee to examine the print *through the glass* to see that no specks of dirt have been taken up between print and plate. If there be, the print must be removed. For perfect results it is absolutely necessary that no grit, dust, or foreign matter, get between the print and glass plate, and for the same reason the plate, when coated with the gelatine solution, must be dried free from dust and other particles. As the prints are squeegeed to the plates, place them one above another, with blotting-paper between them. Allow them to remain for ten minutes in the hot, dry season, to twenty minutes in the cold season, then proceed to strip them as follows:—Take those that were squeegeed first, place them, glass side down, in an iron enamelled dish or a porcelain dish that will stand hot water. An iron dish is best, as it can be placed over a stove to keep the water hot. Pour in enough cold water to just cover the prints, and then add boiling water to about double the bulk of the cold water previously put in. To keep the water at this temperature, the following is an excellent dodge. Get a box, about eighteen inches deep, and remove the lid. Other dimensions are indifferent, provided there is room for an ordinary duplex wall lamp inside and for the dish on top. Out of the bottom of the box cut a square piece an inch or so shorter each way than the bottom of your dish. Now cut rectangular pieces from the four edges to which the lid was originally fastened, and round the four sides, near the original bottom (say, two inches from it), bore holes to allow of ventilation. You have only to place this over the lighted lamp, the original bottom with the cut-out aperture uppermost, and over this aperture place your dish. The prints having remained in the hot water for about fifteen minutes, take one out, and, holding it glass side up, gently press with the tips of the fingers upon the paper near the edge, as though to *slide* the paper off the glass. If the print is ready to strip, the paper will slide away from its film, and show its white edge. When this happens, put your thumb nail (it is handy to keep it a little longer than usual for this express purpose) between the paper and the glass at one corner, press the flesh of the thumb up against the nail, and you secure the paper between the flesh and the nail. Gently draw back the paper till you can secure it between the fingers, then put it back in the dish, and gradually pull the paper from the plate, leaving the film attached to the latter. Now go on with the remaining ones, till all are stripped. Examine the plates, and see that they are clear and bright, without streaks. If all right, remove to a dish of clean cold water. If they be streaky, gently dash the hot water over them till streakiness is removed. If the streaks are obstinate, rub with an exceedingly light touch with a sponge well filled with hot water. When clear, wash in clean cold water for a few minutes, and then place them in a rack to dry.

After drying, if they are satisfactory, they should be varnished with "crystal" varnish. If for lantern slides, thoroughly clean and polish a cover glass with French chalk and a little spirits of wine, and proceed to bind the slide and cover glass together in the usual way. Before putting in the mask, however, I strongly recommend the following plan, as it adds wonderfully to the vigour and brilliance of the slide. Having selected your mask, instead of placing it in position as it is, cut away from its *outside* edges sufficient to leave a margin of an eighth of an inch of bare glass. When the slide is bound up, a transparent border or frame will be left round the picture.* To prevent the mask slipping about during the operation of binding, put a minute spot of good gum on each corner of it—do this with a match or pointed stick—and then place it in position on the cover glass, gummed side to the glass, of course. There is then no fear of its getting displaced. Follow the same plan in making window transparencies. The latter must be backed with ground glass. For the latter, if you are economical and have time, use your old negative glasses, thoroughly cleaned. To grind, proceed as follows:—Get a piece of one-inch board, eight or ten inches square, plane it on one side, and on this side glue a piece of American cloth, the under side next the board. You now want a piece of sheet lead about three inches square, and a piece of wood an inch and half thick, two and a half inches square. Place the lead upon this, knock up the four sides of the lead to the sides of the wood block and nail it to it. The face of this lead-covered block must be perfectly flat, and must be hammered till it is so, and then be rubbed on an even stone slab till its surface is smooth and level. Get a tin of Oakey's knife polish, and you are then in a position, with the help of a little elbow grease, to make ground glass of a superior quality, be it for cover glasses, focussing screens, or any other purpose for which it is a necessity. Place the glass to be ground, which must be previously cleaned, on the board, sprinkle it with soapy water and then with a small quantity of knife polish, and proceed to rub with the block, using a circular motion and fair pressure. Examine the glass now and then to see how it progresses. I find a 12×10 glass in about twenty minutes. The emery powder (knife polish) and soapy water must be renewed as required. Be careful to keep grit or foreign matter off the plate, or scratches will result. Instead of the lead-covered block, a cutting shape may be used, say a quarter-plate one.

For hanging up window transparencies very neat and cheap metal frames may be bought, but they may be hung up with tape as follows:—Having selected your tape (or, it may be, ribbon), cut a piece of sufficient length to go round the transparency *plus* such further quantity as will give you the requisite hanging length. This you will understand better from what follows. The tape being cut, its two ends are sewn together; it is then glued or pasted on the transparency exactly as if you were binding a lantern slide to its cover glass, but on three sides only—that is, on the *bottom and both sides*, the fourth and *top* side being left as it is. You then have a loop at the top by which you can suspend the transparency. Opals, if bound up in this way with *suitable* ribbon and hung upon the wall, are very effective. Of course, some taste is necessary to avoid inartistic combinations. It will be noticed that the image, or film, say, will be reversed on transferring it from its original paper support. This is of no consequence when making lantern-slide or window transparencies. It *may*, however, be an objection when the transfer is made to opals, plates, plaques, &c.—I say *may* be an objection, because, where the transfer is a view taken for its pictorial value, it cannot be of consequence if it should be reversed; hence it may be treated exactly as you would a transparency, but omitting the bichromatised gelatine substratum, using a substitute as given in the next part of the paper.

Transferring Prints to Plaques, Opals, &c., by Double Transfer.

Where it is an objection to have the prints reversed, recourse must be had to what is called "double" transfer; that is, they must first be transferred to a "temporary" support, and then, when the film is cleared, it is again transferred, this time to its final support, be it opal, plaque, wood, &c.

For the temporary support I can suggest nothing better than that sold by the Autotype Company for the purpose of carbon-tissue development. Being flexible it is much better adapted for our purpose than aught else I am aware of, unless it be the celluloid temporary support sold by the same firm. This latter, however, imparts a matt surface to the film, which may be an objection or a recommendation according to individual tastes. Both of them are sold at low prices, the first-mentioned being about one shilling for a dozen $7\frac{1}{2} \times 5\frac{1}{2}$ pieces; the celluloid, same size, fivepence per piece. Both of them can be used an indefinite number of times, so that the extra cost is practically *nil*.

Several pieces will be required in any case, as we shall have pictures of different sizes and shapes, and it is advisable to use a piece of temporary support, but slightly larger than the print it is to carry, and, moreover, of the same shape. The reason for this will be obvious, for

* This is Dr. Tulloch's method, and answers perfectly with these slides.

stance, in the case of transferring a round or oval picture to a plaque; or should we use, in this case, a square piece of temporary support, we ight find that the four corners were in the way, and prevent the necesry perfect contact between film and plaque when finally transferring.

Those who use celluloid films for their negative-making will find that oilt films, carefully cleaned, will serve as well as the aforementioned pports. After cleaning off the old film (carefully avoiding scratching e celluloid), give it a final cleaning with charcoal or wood ashes, dusted through a fine muslin bag, then gone over with a damp rag; wash ell and set aside to dry.

Having procured the temporary support, it must be treated with a axing solution, composed as follows:—

Yellow resin	1½ drachms.
Beeswax	½ ,,
Turpentine	5 ounces.

Melt the resin in a glass or glazed earthenware jar, add the beeswax, nd when this is melted add the turpentine. A little of this solution is prinkled on the temporary support, and then rubbed lightly with a rcular motion with a piece of smooth flannel. When the support has been oroughly gone over, put it aside for a few minutes to allow the turpenne to evaporate, and then go over it lightly with a piece of clean flannel. number of pieces may be treated at once, and kept ready for use. The mporary supports being ready, the finished and trimmed paper prints re transferred to them exactly as previously directed for the single ansfer to glass, the only difference being that a little extra care must be xercised in ascertaining the right moment for stripping the paper, and n placing the print in the centre of the support. Having transferred he prints to the temporary supports, you are now ready for the first tage in the final transfer. Let us suppose it is a porcelain plaque that is o receive the picture. The plaque should have first been cleaned carefully y rubbing with wood ashes and a damp, soft rag, then well washed and oated with the following solution flowed over it, and the excess drained ff:—

Gelatine	2 drachms.
Water	5 ounces.

Soak the gelatine in the water for a couple of hours, then dissolve in a vater bath, *i.e.*, stand the vessel inside another containing hot water. Dissolve, in a separate vessel, three grains of chrome alum in half an ounce of water, and add this slowly to the gelatine solution, stirring well while doing so.

The plaque is coated with this solution while warm, and, having drained off the excess, the picture on the temporary support is placed in position and squeegeed into contact. This is best done with a fair-sized piece (say three inches long) of ordinary indiarubber used for erasing pencil marks, first neatly cutting the edges quite square. Placing the fingers of the left hand on the edge of the support carrying the picture, with the rubber in the right hand, press out the surplus gelatine with a light, scraping pressure, working from the centre and turning the plaque round. In this way perfect contact is secured.

It is then set up to dry, when the temporary support can be stripped, leaving the picture on the plaque. The same method is used for transferring prints to opal, china, and other non-porous materials by double transfer.

When the single transfer is used, as in the case of prints from reversed negatives, or such pictures as allow of reversal on the final support, as already mentioned, they may be transferred without the use of a substratum on the final support if the operator be expert. For ensuring the adhesion of the film to the support while stripping the paper, the opal, &c., should be coated with—

Gelatine	1 drachm.
Water	5 ounces.

Drain off surplus, and soak when set in the "antifoudre" bath for ten minutes. The prints may then be transferred as detailed for the single transfer.

To transfer prints to such objects as cannot be handled in the manner described, a different method must be adopted. Supposing the print ready for final transfer, *i.e.*, already transferred to a piece of temporary support, and cleared of streaks and adhering particles. While still wet, brush over the picture a thin coating of the gelatine solution previously mentioned while hot, and quickly squeegee it in the position it is to occupy. When perfectly dry, the temporary support can be stripped, leaving the picture in position. In double transfer care must be taken to leave the temporary support properly waxed to ensure its leaving the film when finally stripped. If the support be new, *i.e.*, never used, it must be waxed twice before using; that is, the operation of waxing is repeated. Moreover, care must be taken that no portion escapes the waxing solution. It must also be borne in mind that the latter must not be put on thickly, but be rubbed off, and the support lightly polished with flannel after evaporation of the solvent.

Transferring to Wood.—While amateurs often may wish to be able to put their pictures upon this material, be it ladies' workboxes, wood panels, &c., this method should be useful to wood-engravers in particular. The print can be finished and viewed before transfer to the wood, direct from the original negative. The film will take the tools without lifting, while it offers numerous advantages over direct printing on the wood.

Wood-engravers, of course, know how to prepare the wood to receive the photographic image, so I confine myself to describing how to prepare it for use in decorative work. I know of no better method than that given by P. C. Duchochois in *Photographic Reproduction Processes* (Hampton, Judd, & Co.).

The surface of the wood that is to receive the photograph should be prepared in the way here described. To facilitate the explanation I will suppose we are about to decorate a lady's workbox with some of our best pictures, which may include a photograph of the owner.

Having decided upon the exact place for the photograph or photographs, proceed to mark it out upon the box with a suitable instrument, such as a square for rectangular pictures, or a compass for circles, the exact size of the dried and trimmed print that is to be transferred. Having marked its position with a piece of glass or a sharp chisel, proceed to scrape the surface of the wood till clean and smooth; finish it with 0 0 sand paper, and then brush it over with the gelatine solution, before referred to, while hot. Let this remain on to penetrate the pores of the wood, but wipe it off with a piece of cloth before it quite sets. Now sponge it over with the "antifoudre" solution, and then, after a few minutes, sponge lightly with clean water for a minute or two. It is then allowed to dry. If the wood is dark in colour, it is better to diffuse a little silver white or sulphate of barium in a small quantity of the hot gelatine solution, and apply it as above in the place of the plain solution. The print is then transferred by single or double transfer as described in the foregoing pages.

After completing the transfer and drying the picture, it may be given a coat or two of crystal varnish.

The ingenuity of the reader will suggest a hundred ways of utilising his pet negatives on the lines herein indicated, deriving much additional pleasure with little extra trouble, and scarcely any other expense than the sensitised paper used.

H. HANDS.

Jubbulpore, India.

PHOTOGRAPHY ON WOOD BLOCKS.

I HAVE had recently occasion to prepare some wood blocks for the engraver, the subjects being some extremely delicate and intricate curved tracery, and, after many attempts, I found the following the best method of procedure.

In the first place, it was necessary to prepare a reversed negative, and, having no reversing prism or mirror, and being afraid to trust to taking the negatives through the glass, the film was stripped and reversed. The negatives, which had to be made on photo-mechanical plates, were developed, fixed, and washed in the usual way, then treated for ten minutes to a bath of formalin, again washed, and stripped by means of the following solution, suggested some time ago by Mr. E. C. Middleton:—

Methylated alcohol	150 parts.
Water	150 ,,
Glycerine	6 ,,
Hydrofluoric acid	12 ,,

In this the plate was laid till the corner of the film could be brushed up, and then transferred to a dish of clean water, which was changed four or five times, and, finally, a piece of stout cut celluloid film, which had not been exposed, but fixed and washed, was laid on top of the film lightly, squeegeed down, and allowed to remain a minute, and then stripped and allowed to dry, when I had a very successfully reversed negative.

I first of all tried all the best known methods of transferring a collodion positive from this negative to the wood; but, notwithstanding the use of an extremely powdery sample of collodion, I was unsuccessful, at least, so the engraver said, as he objected to the film. Sensitising the block direct with a chloride, followed by silver nitrate, he objected to because it stained the wood, and, he said, made it rotten for the graver;

whilst the pigment process he declared to be worse than useless, as it not only prevented him from cutting the clean, fine lines, but chipped off very readily.

The wood blocks, when received by me, were coated with a white film, or, at least, were whitened, and this I afterwards found to be the finest white lead, thoroughly washed to free it from coarse particles, the same as emery is treated, and then rubbed into the surface of the block with the ball of the thumb, a little very dilute albumen being used as a binding material. The exact proportions for this I was unable to find out, as the engraver said it was a trade secret.

My first attempt to sensitise the block was with a printing-out emulsion, made according to Lainer's formula, which was only modified by the omission of the zinc white which he recommends :—

A.

Gelatine (1:30)	1·5 c. c.
Albumen	5 ,,
Ammonium chloride (1:10)	1 ,,

B.

Silver nitrate (1:5)	5 c. c.
Citric acid (1:2)	3 ,,
Water	4·4 ,,

The albumen was obtained from an egg, and was thoroughly beaten to a froth, and then allowed to stand till it became liquid, and carefully filtered.

The two solutions were mixed in a glass mortar by allowing the silver solution to drop slowly, with constant rubbing, into A. I tried adding it in small quantities and shaking well, but found that the resulting emulsion was lumpy, due to the coagulation of the albumen.

As soon as the emulsion was made, it was spread over the wood block by a flat brush, using the brush in one direction only; and the marks were then evened out by using a small varnish mop in circular strokes, with very light pressure ; and, as the film set, it soon assumed a perfectly even surface.

The next difficulty was the printing frame, and, as the block was too thick for any ordinary frame, I had to borrow one from a photo-mechanical worker—one of the deep wooden-box form, with screws and a plate-glass front. As the lines of the drawing were practically without any deposit, in order to avoid having to examine the block during printing, a piece of the gelatine was stripped off the celluloid, leaving nothing but the latter, through which the depth of colour of the wood surface could be seen. When printed deep enough, the block was removed from the frame, the edges rubbed with encaustic paste to prevent the soaking in of the solution, and the surface just immersed in a combined toning and fixing bath, and then rapidly rinsed and dried.

Very successful results were obtained in this way, but, on account of the difficulty of obtaining anything like satisfactory prints, even with a day's exposure, at this time of the year, I made repeated attempts to obtain a bromide emulsion which could be developed, and finally settled down to the following formula, which, as will be seen, is really founded on Lainer's formula, given above :—

A.

Gelatine (1:30)	4·5 c. c.
Ammonium bromide (1:10)	·758 ,,

B.

Silver nitrate (1:5)	5 c. c.
Citric acid (1:2)	3 ,,
Water	4·5 ,,

The solutions were mixed in a mortar, and, of course, in the dark room, and then applied to the block as the other was.

This emulsion was allowed to set, broken up, and washed, then re-melted and distributed on the block, as with the printing-out emulsion, and, of course, in the dark room, and then exposed under the negative to gaslight, and finally developed with ferrous oxalate, and fixed with cyanide and washed.

A. D. Pretzl.

THE STATUS OF PHOTOGRAPHY AND PHOTOGRAPHERS.

The compilers of the Census Reports classify photographers with the professions, under the sub-section of "artists." There is thus a governmental recognition that photographers are a professional, as distinct from a mechanical or trading class, quite independent of the sentiment of the general public, who probably have no pronounced view, but take photographers at their own valuation; and of certain critics who have a very decided opinion that photography is mechanical, and photographers mere traders. This high estimate of photography taken by the Census authorities may have arisen in the early days, when its status was considerably above what it afterwards became, or is at the present day.

From the introduction of the Daguerreotype up till the time of collodion, say from 1839 to 1855, the status of photography stood high ; with the general use of collodion, the rise of a commercial class, and the wearing away of the novelty of the new discovery, its position was somewhat degraded. This continued until gelatine and rapid dry plates supplanted collodion about 1880, since when scientific men, wealthy amateurs, and others have helped to raise photography to its first state, and to regain some of its lost prestige.

In 1843 the dignified and solid *Edinburgh Review* contained a lengthy account of photography, giving particulars of the two processes of Daguerre and Fox Talbot, then known, the author even going so far as to rate the Royal Society for refusing to publish its processes in their *Transactions*, and the Premier, the Government, and the representatives of the people, and the peers, for not adequately rewarding the inventors. He says, in reference to Fox Talbot: "The inventor was left to find the reward of his labours in the doubtful privileges of a patent; and thus have these two beautiful and prolific arts been arrested on English ground, and doomed to fourteen years' imprisonment in the labyrinths of Chancery-lane."

Such advocacy in the pages of the *Edinburgh Review* gave national importance to photography, being evidence also of the interest it excited amongst men of every class.

In the first years, too, it attracted the attention of the leaders of science, men of the calibre of Sir John Herschel, Dr. Draper, of New York, Professor Moser, of Königsberg, Faraday, and Crookes, of X-ray fame, investigating its phenomena, men like Arago and Gay-Lussac bringing under the notice of the French Government the claims of Daguerre upon the national bounty. From that time until quite recently no such list of men of the first rank can be cited in connexion with photography, in England Abney having stood almost alone since 1872, and Robert Hunt, with his *Researches on Light*, in 1854, being his nearest predecessor.

Those early days of photography were days of enthusiasm, when hopes ran high, expectation yet higher, and the goal within sight, which every experimenter was striving to reach—the reproduction of natural colours. Painters were to be dethroned, and photographers reign in their stead.

Many amateurs, likewise, of the stamp of Fox Talbot, and the Nièpce family, the most charming of scientists, devoted their leisure and wealth to examining and improving the methods and processes of photography, giving to this pursuit more than they could expect in return. Our *Edinburgh Reviewer* caught the general enthusiasm, for he writes in the following strain : "From being at first a simple, and not very interesting, process of taking profiles of the human face, it has called to its aid the highest resources of chemistry, and physics ; and while it cannot fail to give a vigorous impulse to the fine arts, it has already become a powerful auxiliary in the prosecution of physical science, and holds out no slight hope of extending our knowledge of the philosophy of the senses. The art of photography, or photogeny as it has been called, is indeed as great a step in the fine arts as the steam engine was in the mechanical arts, and we have no doubt that, when its materials have become more sensitive, and its processes more certain, it will take the highest rank among the inventions of the present age."

John A. Randall.

(To be continued.)

SENSITISED PAPER SUITABLE FOR PHOTOGRAPHIC PURPOSES: FRIESE-GREENE'S IMPROVEMENTS IN MANUFACTURE.

Mr. W. Friese-Greene, of 39, King's-road, Chelsea, says: "Hitherto, in the manufacture of sensitised paper, it has been usual to take paper of special make, and to sensitise it by coating the surface with sensitising materials, such, for example, as solutions of silver, iron, or platinum salts. This method of sensitising the paper is expensive and inconvenient, inasmuch as it necessitates a distinct operation.

"Now, according to my invention, I apply the sensitising materials to the paper in the course of its manufacture. The two processes, *viz.*:—the manufacture and the sensitising of the paper are thus effected at one and the same time, instead of, as heretofore, at separate times. The parts of the paper-making and sensitising machinery, between the place where the sensitising materials are introduced and the place where the finished paper is wound on a drum or roll, should be enclosed, and no light admitted, except through red-covered or other non-actinic openings, and any parts of the machinery with which the pulp or paper web comes into contact, after the addition of the sensitising materials should be made of substances which will not injuriously affect those materials.

"The sensitising materials may be introduced into the paper while this is in the state of pulp, and, in this case, I preferably add them just before the pulp is run upon the wire web or other 'former,' care being taken to thoroughly mix them with the pulp. I prefer, however, to apply the sensitising materials after the paper has 'formed' and has become more or less dry, or, more correctly speaking, when it is still more or less moist. They can be applied to the surface by a suitable spreader before the paper web reaches the winding-up roll. This spreader may conveniently be in

the form of a rotating roller, partly immersed in a trough containing the sensitising materials; the 'formed' web is caused to travel over the upper surface of this roller, and and is kept in contact therewith by an upper guide roller, so that the spreading roller, as it rotates, becomes coated with the sensitising materials, and transfers them to or spreads them upon the paper. In order to ensure more uniformity in the distribution, one or more other rollers may be placed between the above-described spreading roller and the paper, like the inking rollers of a printing machine.

"If it be required to apply the sensitising materials to both surfaces of a 'formed' and still more or less moist web, it may first have them applied to one surface, in the manner above explained, and then the web may be reversed so as to bring the other surface to the bottom, and this surface may then have the sensitising materials applied to it by a similar arrangement of rollers. Or, when both sides of the moist paper web are to have the sensitising materials applied to them, it may be caused to travel, by means of guide rollers, through the sensitising materials in a trough."

The claims are:—

1. The mode of manufacturing sensitised paper, suitable for photographic purposes, which consists in applying the sensitising materials to paper in the course of its manufacture from the pulp into the dry web, substantially as hereinbefore described, whereby the two processes of manufacturing the paper and sensitising it are effected at one and the same time.

2. The addition of sensitising materials to paper pulp, preparatory to the pulp being run upon the wire web or other "former."

3. The application of sensitising materials to a paper web, after it has "formed," but when it is still moist.

FIXING AND REDUCING BATHS.

In the British Journal of the 8th inst., "Free Lance" comments upon a statement of mine to the effect that the density of a negative can be reduced by fixing in a hypo bath to which sulphite of soda, acidulated with hydrochloric acid, has been added. He asks, Wherein does this fixing and reducing bath differ from the ordinary acid fixing bath, "which certainly does not reduce density?" Though an acid fixing bath, containing either potassium metabisulphite or sodium sulphite, acidulated with sulphuric acid, may not appear to have any appreciable reducing effect during the ordinary time of fixation, yet it has a fairly marked effect if allowed to act long enough. This action of acid fixing baths has been pointed out by Herr Lainer. If, however, hydrochloric acid is substituted for the sulphuric acid, then a reducing effect takes place during the short time necessary for fixation. The high lights lose density to a considerable extent, while the shadows lose their finer details to only a very slight extent; hence this method of reduction is, in certain cases, particularly advantageous. This acid fixing bath differs from the others in that it contains a haloid salt, and in this respect it corresponds with another reducing bath, also recommended by Lainer, which simply contains hypo and potassium iodide; consequently it may reasonably be assumed that in both cases the loss of density is due in some way to the presence of the haloid.

There is a point in connexion with fixation that seems to me to be somewhat important, and which should, I think, be considered in investigating the causes of loss of density during fixation. In cases of normal exposure, development is never carried as far as possible; consequently the film, when immersed in the fixing bath, must contain a considerable proportion of partially reduced silver haloids, or subsalts, which will be decomposed by the hypo into metal and soluble normal salt; that is to say, metallic silver is reduced during fixation. If this reduction takes place in the presence of a haloid salt, a soluble haloid salt of silver may be formed, and metal lost that otherwise would go towards making up the density of the image. It is fairly obvious that loss of density in the fixing bath depends a good deal upon incomplete development. An under-developed film loses a great deal, even in a plain hypo bath; while, on the other hand, an under-exposed film that has been subjected to forced development loses very little. In the first case, the development of the exposed particles is very incomplete, and a great deal of subsalt must be carried into the fixing bath; in the second case, the reduction of the few particles exposed is fairly complete, and very little subsalt remains. It, therefore, seems highly probable that the loss of density is mainly due to the presence of subsalts in the film; or, in other words, to the reduction of metal in an extremely fine state of division during fixation.

It has been proved that finely divided silver is, to a certain extent, soluble in plain hypo under the ordinary conditions of fixation (that is, in an open dish), if the operation is sufficiently prolonged; and this solvent action is probably accelerated by the presence of sulphurous acid, and still further assisted by the presence of a haloid salt, with which the reduced silver may react while in the nascent state.

"Free Lance" has rather exaggerated the direful effects of the acid liberated. The fumes are unpleasing, but certainly no worse than those given off by a fixing bath containing potassium metabisulphite. I have used both baths frequently, without any ill effects, but it is advisable to keep at a respectful distance from either of them. The acid has no effect upon the hypo if both hypo and sulphite are freshly dissolved; but, if stale solutions are mixed, the bath will become cloudy in about five minutes, and this is the case with any kind of acid fixing bath. The relative proportions of sulphite and acid may be fixed at about ten drops of hydrochloric acid to every ounce of sulphite, and from a quarter to, say, one ounce of sulphite may be used to every four ounces of hypo. These proportions are founded upon the formula originally given by Herr Lainer, and which was published, I believe, in the British Journal Almanac a few years back. The reducing effect varies with the amount of acid sulphite used, and the proportions given above may be increased if the image is badly over-developed. C. Welborne Piper.

PORTABLE DEVELOPING TENTS: HOFMANN'S IMPROVEMENTS.

Herr Hofmann, of Offenbach-on-Main, says of his improved apparatus:—

"This improved dark chamber consists essentially of two parallel walls, which are connected with one another by means of a bellows bag, or the like.

"In the front wall there is a suitable opening closed by a coloured disc, and further, to the right and left of this opening, two holes for the passage of the arms of the operator.

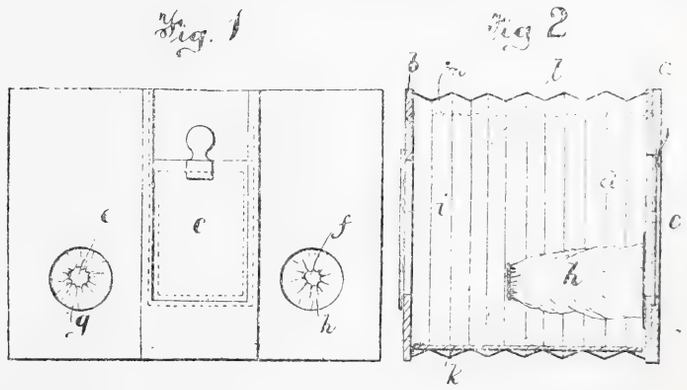
"These two holes are each provided with a sleeve projecting inwardly into the chamber, which sleeves, at their inner ends, are drawn tightly round the wrists of the operator, and are thus closed against the admission of light from the outside.

"The rear wall of the chamber has also an opening covered by a coloured plate or disc of suitable material.

"In order to utilise the apparatus it is first expanded, then the bottom board, which has been folded up in the inside against the rear wall, is let down and supported or engaged at both sides, or at the top on the edges of the front wall.

"The whole apparatus is next placed on a table in the daytime, with the rear disc against a window, or the like, and at night in proximity to a lamp or other suitable light.

"An essential condition of such an apparatus is that it must occupy as small a space as possible. This improved dark chamber is therefore



so arranged that the whole person of the operator does not enter therein, but only his arms, whilst he can still see well all that takes place inside.

"In the accompanying drawing,

"Fig. 1 is a front view;

"Fig. 2 a vertical section; and

"Fig. 3 a horizontal section of this improved chamber; and

"Fig. 4 a side view of the chamber when collapsed.

"This improved dark chamber consists essentially of two parallel walls, *a* and *b*, which are connected with one another by means of a bellows bag, or the like, *l*.

"In the front wall, *a*, there is a suitable opening, *d*, closed by a coloured disc, *c*, and, further to the right and left of this opening, two holes, *e* and *f*, for the passage of the arms of the operator.

"These two holes are each provided with a sleeve, *g* and *h*, projecting inwardly into the chamber, which sleeves, at their inner ends, are drawn tightly round the wrists of the operator, and are thus closed against the admission of light from the outside.

"The rear wall, *b*, of the chamber has also an opening, *i*, covered by a coloured plate or disc of suitable material.

"In order to utilise the apparatus it is first expanded, then the bottom board, *k*, which has been folded up in the inside against the rear wall, *b*, is let down and supported or engaged at both sides, or at the top on the edges of the front wall, *a*. A hooked rod, *m*, pivoted on the front plate, *a*, is then turned up into a horizontal position, and its hooked end inserted in an eye on the rear wall, *b*, thus holding the whole rigidly together.

"The whole apparatus is next placed on a table in the daytime, with the rear disc, *i*, against a window, or the like, and at night in proximity to a lamp or other suitable light.

"By raising the front plate or slide, *c*, the exposed plates, developers, and the like may be inserted in the chamber.

"The plate or slide is then again closed, the arms are passed through the holes, *e* and *f*, hereinbefore mentioned, and secured in the sleeves, and the person is then in a position to develop, fix, or otherwise treat the plates in the ordinary manner, as everything can be inspected and examined through the front disc or plate, *c*.

"After use, the whole apparatus may be collapsed, as shown in fig. 4, and inserted in a suitable bag or pocket, and it thus becomes conveniently portable."

The claim is for an improved collapsible portable dark chamber, consisting of two walls, *a* and *b*, connected with one another by a bellows bag, or sack, and an inner board hinged to the front wall, both walls having openings provided with coloured plates or discs, and the front wall, *a*, having also two openings provided with sleeves or the like to admit the arms, the inner hinged board being adapted to be turned down, in order to fix up the whole apparatus.

APPARATUS FOR WASHING PRINTS: KERR'S IMPROVEMENTS.

Mr. W. Kerr says that his device consists of a cylinder free to turn on its axis, which may be either horizontal or vertical, in a trough of water. The cylinder has longitudinal slots cut in it at intervals, and the prints are held, one at the edge of each slot, by means of spring catches or the like. At or near the edge of each slot is fitted, preferably on the inside of the cylinder, a vane or bucket, in or against which one or more jets of water, from a perforated or slotted tube or pipe fitted within the cylinder and supplied with water from any convenient source, is directed so as to cause the cylinder to revolve with a turbine or water-wheel action. As the cylinder revolves, the water escapes from it out between the prints and effectually washes them. The water escapes from the trough either by an overflow or through a suitable stop cock.

Our Editorial Table.

Photographische Chemie und Chemikalienkunde.

By Adolf Hertzka.

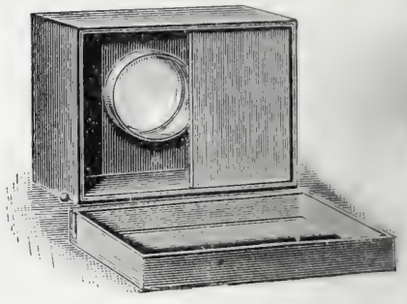
Robert Oppenheim (Gustav Schmidt), Berlin.

Upon questions of photographic chemistry this will, doubtless, become a favourite book of reference for German photographers, and English students, conversant with German, will find it a valuable addition to their bookshelves. The work deals with photographic chemistry and chemicals, and is divided into four sections, viz:—General Chemistry, Photo-chemistry, Chemicals, and Analysis. The first treats of the rudiments of the science, and gives an illustrated description of useful chemical apparatus. The second deals with the action of light and the chemistry of the silver salts in relation to photography, development, fixing, toning, intensification, &c. The third, extending to about 450 pages, is of high merit, being a carefully compiled dictionary of photographic chemicals. It is probably the best work of its kind, and the information is very complete, comprising general properties, atomic weight, degree Beaumé, preparation, impurities, solubility, molecular weight, reaction, symbol, synonyms, boiling point, specific weight and uses in photography. Under the heading of Chromates, the author gives an excellent *résumé* of the processes in which these salts play an important part. We notice, in connexion with the photo-autocopyist process, that the name of a reporter is appended, instead of Mr. Warnerke's. If we remember rightly, he it was who suggested to the patentees its application to photography, and he gave the lecture and demonstration described in the report. The fourth part deals with qualitative and quantitative analysis. The work is a valuable addition to the photographic literature published by this firm.

Tylar's Duplicator.

William Tylar, High-street, Aston, Birmingham.

This is a simple device for enabling a person to be photographed in two positions on one plate. It fits on to the hood of the lens, the cork back being cut out for the purpose. The sitter is posed and an



exposure made; then the sitter's position is altered and the sliding partition pulled over and the second exposure made. The lid acts as a cap, and is used after each exposure. The Duplicator is a cheap and handy little photographic tool.

Caóba: A Real Romance of the Cuban Rebellion.

By Dr. P. H. Emerson. London: David Nutt.

Dr. Emerson tells us that he lived in Cuba many years ago, but the information was not necessary, for these glowing pages could only have been written by one who lived among and witnessed the scenes he describes. The story treats of life on a great sugar plantation, and the incidents of slave labour and the mutual hatreds of Spaniards and Cubans supply the author with many dramatic themes, handled with rare skill and firmness. After the death of the great planter, Don Enrique, his estate becomes the sport of conflicting and treacherous interests, the slaves rebel and are headed by a bold but brutal negro, Caóba, whose career is prematurely terminated by the knife of a traitor. Dr. Emerson does not paint the rule of the Spaniard in any too favourable light, and hints that annexation by the United States is the best thing that could happen for the island. Be that as it may, one feels, in reading these pages, that Cuban life and incident are being narrated to us with most conscientious fidelity. Aside of its present political interest, the grim intensity and realism of *Caóba* constitute it an absorbing little drama that few readers will put down until its gruesome end has been reached.

Fleming's Printing Inks.

A. B. Fleming & Co., 101, Leadenhall-street, E.C.

From Messrs. A. B. Fleming & Co., of London and Edinburgh, we have received a portfolio of illustrations, printed with many of the inks they prepare for photo-chromic and other special purposes. Richness, beauty, and variety characterise these inks, to the production of which Messrs. Fleming evidently devote the greatest care.

The Vanguard Photographic Specialities.

The Vanguard Manufacturing Company, Maidenhead.

The photographic specialities of the Vanguard Manufacturing Co., who are new entrants into the sphere of photographic production, are made according to the formulæ and under the supervision of Mr. W. Ethelbert Henry, C.E., whose practical photographic knowledge justifies us in expecting preparations of undoubted suitability and excellence. Samples of some of those preparations have been placed before us; and they appear to be extremely well adapted for their special purposes, having evidently been compounded with great care. Among them are "Glutogene," a fine homogeneous adhesive for mounting prints; "Photopake," an opaque for spotting out, blocking out, and various similar purposes; "Nigrogene," a dead black varnish for woodwork &c.; and a retouching medium and matt varnish. Besides commending the excellence of these products, we also take occasion to compliment the Company on the neatness of their "get-up," a feature that will do much to make the Vanguard specialities attractive to retailer and consumer alike.

Specimens of Half-tone Printing.

The St. Dunstan's Engraving Company, Fetter-lane.

These examples of half-tone printing, including a neatly got-up album of Tunbridge Wells views, from Mr. Carl Norman's negatives, are of exceedingly good quality, and do credit to the St. Dunstan's Works. These works, we may mention, have recently passed into the hands of the Photo-chrom Company, who, as we have already announced, are extending their sphere of operations into various branches of photographic reproduction. For the Company we have no hesitation in predicting great success, the skill and enterprise of which they have control placing them in a position to compete with the foremost houses in the trade.

Bournemouth Illustrated.

Published by W. Mate & Sons, Bournemouth.

The beautiful Hampshire watering-place forms the subject, in this tastefully produced volume, which sells at 1*s.*, of an exhaustive description and numerous half-tone illustrations of excellent quality prepared from good original photographs. It is one of the best seaside guide-books that we have seen. The natural delights of Boscombe, Lymington, Corfe Castle, and other attractive spots in the neighbourhood of the "Evergreen Valley," are also set forth in the volume, a contemplation of which recalls to us many pleasant recollections of a charming and interesting district.

The "Entr'acte" Annual.

Edited by W. H. Combes. Published at 3, Catherine-street, Strand.

This vivacious annual, which appeals to music-hall folk, has a number of Mr. Alfred Bryan's characteristic, but always welcome, cartoons, and stories by the Editor, Mr. John Hollingshead, Richard Henry, and other writers. The annual is interesting, not only to those more directly concerned, but to the outside public, who will find much in it of an entertaining character.

The "Era" Annual.

Edited by Edward Ledger. Published at 49, Wellington-street, Strand.

Mr. Ledger's annual is full of information designed for the use of members of the dramatic and musical professions. A series of admirable half-tone portraits of rising actresses is given, and there are biographical notices of players of the present period, lists of new pieces recently produced at home and abroad, lists of theatres and music-halls, a calendar, and an obituary. The *Era Annual* is undoubtedly a very useful book.

News and Notes.

The Annual Dinner of the Hackney Photographic Society will take place at the London Tavern, Fenchurch-street, on Tuesday, February 23.

Lenses for Animated Photography.—J. Swift & Son, of 81, Tottenham Court-road, announce that they have constructed a special series of short-focus lenses for projecting the films upon the screen, the foci of them being as follows, viz., 2½, 2¾, 3, 3½, and 4 inches.

Brixton and Clapham Camera Club.—Mr. James A. Sinclair, F.R.P.S., will demonstrate the *Artigue Method of Carbon Printing* at the Brixton and Clapham Camera Club's rooms, Brixton Hall, Acre-lane, London, S.W., on Tuesday, February 2, at 8.30 p.m. Cards of invitation may be obtained of the Hon. Secretary, 116, Loughborough-park, S.W.

On February 2 the first weekly part of a People's Edition of Cassell's *Old and New London*, including *Greater London*, will be published. It will contain a large coloured map of London (scale four inches to the mile), brought up to date as far as practicable, and clearly showing the railway stations, tramways, parks, public buildings, theatres, &c., of the metropolis.

The Exhibition of Canine Photography on the occasion of Cruft's Dog Show, Agricultural Hall, will be held on February 10, 11, and 12. The Judge will be Mr. Thomas Bedding (The British Journal of Photography). The schedule contains full programme and entry form, and is now ready. There is no entrance fee. The offices are at the Royal Agricultural Hall, London, N.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday next, February 3, paper and demonstration by Mr. H. Snowden Ward, subject, *Acetylene*. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

"It is well known," says *Nature*, "that air currents containing either drops of water or fine dust in suspension give rise to electrification whenever they impinge on a solid obstacle. Mr. P. de Heen, guided by the view that electricity, independently of all luminous phenomena, can produce photographic impressions, has tried the experiment of allowing a current of air, laden with lycopodium powder, to fall on a sensitive plate, and the photograph thus obtained is reproduced in the *Bulletin* of the Belgian Academy. With an uncovered plate a feeble but distinct impression was obtained after one and a half hours; but, by using a covered plate, a much more powerful impression was produced. The most remarkable feature is, that where the covering has been broken away dark ramifications are seen extending some distance into the covered portion, and these appear to follow the directions in which electricity has been propagated along the surface of the plate."

Bolton Mutual Photographic Society.—By permission of the Chairman of the Technical Instruction Committee, two meetings have recently been held in the Technical Schools, Bolton, to consider the formation of a new photographic society. From the very fair attendance and the enthusiasm shown in the proceedings, it is very evident that such a society as it was proposed to form was required. It was decided to call the new association the Bolton Mutual Photographic Society. The Rev. G. H. Carnson was elected President, and much organization work was gone through. The Executive Committee and various sub-committees for carrying on the work of the Society were formed. They hope to work on new lines, the Committee having under consideration many proposals for the benefit of those in the district interested in the art-science of photography. The subscription has been fixed at 5*s.* per annum. Full particulars may be had from the Hon. Secretary, Mr. Peter Woods, Technical Schools, Bolton.

A Safe Hair Exterminator.—It is easier to pull down than to build up, even when the subversive efforts have merely a human head of hair for their object. Gibbon, the historian, gave expression to a thought similar to this when descanting upon military glory, and a young Viennese physician has now further illustrated it by employing the X rays as a hair exterminator. Like all great discoveries, it was the result of an accident. Some foreign doctor, having heedlessly exposed his Samsonic locks to the Röntgen rays, became like unto the prophet whom the Hebrew street boys called "bald head," and angrily wrote to the papers about it. Dr. Freund, of Vienna, read the statement, and resolved to apply the rays as a hair exterminator. He tried the plan first upon a boy, whose spine was positively hidden by an abundant crop of hair. The malady is known to the faculty as hypertrichosis, and many a fair one who suffers from it, especially in France and the Caucasus, where it assumes the form of a moustache, would pay readily and heavily for a safe cure. Now it is to be had for nothing. Dr. Freund turned the mysterious rays upon the boy's back, and the superfluous hair vanished for good, roots and all. The boy, no longer an infant phenomenon, has been shown to the Medical Society of Vienna, and photographs of his condition "before and after" are circulating in the city. It may be true that there is nothing new under the sun; still it is none the less probable that, if the Philistines had known of this property of the rays, they would have saved no end of trouble to Dalilah, and kept Samson's locks from starting afresh.—*Daily Telegraph.*

New Telescopes.—"Astronomy is the science of the infinite, and, although the building of huge telescopes is at present so limited," writes Dr. Gordon Stables in the *Scotsman*, "that we have not yet been able to see to pick up pins on the moon, or bring into view the winged men of Mars watering and irrigating their gardens, still there is no saying what a day or an hour may bring forth. The Proctor Memorial Telescope, to be built on San Miguel, California, will have a ten-feet object-glass, the largest at present being only three feet four inches. This would mean a great stride; but a bigger seems to be in contemplation, for glass, or glass alone, is not always to form the lens, but oxygen gas, by the aid of which we may get a lens that will give results hitherto undreamt of. Depend upon it, we are going to solve the mystery of Mars yet, and a good many mysteries besides. Meanwhile, to thinking men—and they are to be met with in all ranks of life—I heartily commend a study of astronomy. The mere rudiments of this marvellous science lead one to truths which almost take one's breath away. By the aid of photography, within a year or two, for instance, millions of new stars, invisible and far beyond the ken of any telescope yet built, have been discovered; and, as these are but suns, with planetary systems revolving around them, our finite minds cannot grasp the trillions or quadrillions of inhabited worlds that are afloat in space. Oh, the littleness of this world and the mental tinyness of poor mortal man! One of the stars visible to the naked eye is a sun 600,000,000 times larger than our earth. When this star cools down and becomes itself an inhabited world, which it must, it may be a planet 50,000,000 times as large as ours. How could any one like to live on an earth as large as this? This question is one you may try to answer and enlarge upon in order to get to sleep to-night."

The Permanence of Art.—Books, said Mr. Val. C. Prinsep, R.A., at the eleventh annual distribution of prizes and *conversazione* of the Clapton Art School, are of little use to art students, because only the doings of great men are chronicled in them, and not what the young students themselves can do. Two men may have exactly the same talents, but one would probably fail hopelessly if he tried to work upon the ideas of the other. The pupil must first obtain a thorough knowledge of art, and then render his own feelings, which he alone can find out. There are many arts—painting, music, architecture, literature; in fact, their name is legion. Art is the expression of a man's feelings, reproducing the visions and fancies which visit the brain, and to which the artist gives form and expression. Different men produce these ideas in different ways, as witness the various works of great painters, writers, and sculptors. In every case the artist has to present the work clothed with his own individuality, if that work is to be of any value. Of all these branches literature is, perhaps, the most powerful, for it grows up with each one from the earliest years. But all of the arts need to be stamped with the individuality of the artist. The actor renders the works of others in his own way. The orator makes his words sublime by his manner of delivery and his eloquence. To those who live in succeeding generations the plays which delighted their ancestors are dull without the magnificent power of a Garrick, who led his audiences to admiration and enthusiasm. But Garrick is now

little more than a name. With painting it is different. A painter cannot hope to excite the enthusiasm which an actor, a musician, or a literary man evokes, because the public, who view his works, are not so easily moved. There is, however, this advantage, his works last, and those who succeed him can see those masterpieces, the actual work of those who called them into existence. In one good picture can be seen what volumes cannot show. There is a painting of that wife-loving English monarch by Holbein, which he ventured to think gave a truer idea of the big Bluff King Hal than any history. He called the attention of the young artists to the exhibition of the late Lord Leighton's works, remarking that there was the same finish about the last works of the late President of the Royal Academy as about those executed forty-five years ago.

Patent News.

THE following applications for Patents were made between January 11 and January 16, 1897 :—

DEVELOPING BOX.—No. 725. "Apparatus for Developing Photographic Plates without the use of a Dark Chamber." Complete Specification. H. B. HELMERT.

VIEW-FINDERS.—No. 771. "Improvements in Photographic View-finders." W. F. BUTCHER and G. HARROP

TAKING LIVING PHOTOGRAPHS.—No. 886. "Improvements in Apparatus for Taking, Copying, and Projecting Living Photographs." J. H. SMITH.

CAMERAS.—No. 974. "Improvements in or relating to the Arrangement and Construction of Folding or Collapsible Photographic Cameras." C. OLIVER.

CHROMO-PHOTOGRAPHY.—No. 989. "Improvements in Apparatus for Obtaining or Exhibiting Chrono-photographs." J. REIGNIER.

X-RAY APPARATUS.—No. 991. "Automatic Apparatus for Producing X-Rays and Showing their Effect on a Prepared Plate or Screen." H. J. DOWSING.

CHRONO-PHOTOGRAPHS.—No. 1039. An Improved Machine or Apparatus for Projecting Kinetoscopic Pictures." T. VAN H. OBELT.

MICRO-KINETOSCOPY.—No. 1213. "Improvements in Microscopical Apparatus for Making Animated Photographs." A. J. HENDERSON.

CAMERA.—No. 1216. "A Combination Mechanical Photographic Camera and Reproducer." T. VAN H. OBELT.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
1	Camera Club	Smoking Concert.
1	Ealing	Lantern Evening.
1	North Middlesex	Informal Meeting.
1	Putney	*The Switzerland of England.* W. C. Plank.—Show of Lantern Slides by Members.
1	Richmond	Lantern Evening: Members' Slides.
1	South London	*Uranotype and its Capabilities.* Albert Hill.
1	Stafford Y.M.C.A.	*My Experiences of Carbon Printing.* Mr. Wray.
2	Brixton and Clapham	*The Artigue Method of Carbon Printing.* J. A. Sinclair, F.R.P.S.
2	Gospel Oak	*Photogravures.* W. Beyer.
2	Hackney	*Failures.* F. W. Gosling.
2	Isle of Thanet	*Negative-making.* Chapman Jones.
2	Lewisham	*Silver Salts and their Photographic Action.* A. J. Dickinson, F.I.C., F.C.S.
2	Rotherham	*The Intensification and Reduction of Negatives.* Thomas Bolas, F.C.S., F.I.C.
2	Wolverhampton	*What to Take and How to Take it.* E. A. Day.
3	Borough Polytechnic	*Platinotype Printing.* A. Bedding.
3	Edinburgh Photo. Society	Discussion on Printing Papers.
3	Halifax Camera Club	*X Rays: Radiography.* A. Priestley
3	Leeds Camera Club	Beginners' Lecture.—VI. *Lantern Slides and Lantern Work.* Mr. Bourke.
3	Leytonstone	*Isochromatic Photography.* G. H. Cricks.
3	Photographic Club	*Acetylene.* H. Snowden Ward.
4	Camera Club	*Flying Machines and Automatic Guns.* Hiram Maxim.
4	Leeds Photo. Society	Annual Lantern Exhibition.
4	Leigh	Competition: Humorous Print.
4	Liverpool Amateur	*Lantern-slide Making.* F. Anyon.
4	London and Provincial	*The Stigmatic Lens and its Uses.* W. E. Debenham.
4	Oldham	Prize Slides.
4	West Surrey	Social Night and Discussion on Society Competitions.
4	Woodford	*Pictorial Photography.* A. Horsley Hinton.
5	Borough Polytechnic	Visit to Brin's Oxygen Works.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 26,—Technical Meeting,—Mr. T. R. Dallmeyer, F.R.A.S. (Vice-President), in the chair.

ARCHITECTURAL PHOTOGRAPHY.

Mr. ERNEST MARRIAGE read a paper, illustrated by a series of very beautiful slides, with the above title, premising that, as he only occasionally required to take a general view or an expansive interior, and seldom exceeded the limits of a doorway or chancel arch, his remarks were chiefly applicable to detail work. He preferred to use a camera with square parallel bellows, with extension as great as possible consistent with perfect rigidity. The swing back, as usually fitted, was inadequate, and should allow the back to be at an angle of 60° with the baseboard. A tilting table was a necessity, most obviously for roof or floor paintings or mosaics. The baseboard of the table should always be first levelled, the camera being then tilted as required. The lenses he used included an eight-and-a-quarter-inch anastigmat for general work, a five-inch concentric, and a four-inch tele-photographic attachment fitted to the former, and he also carried a two-foot rule, spirit level, pincers, magnesium ribbon, sensitometer, focussing glass, changing bag, plate duster, and note book. A slow plate was more generally useful for architectural work, and should be backed. Full notes of exposures should be taken on the spot, and the various subjects should be located by numbering a rough plan of the building in accordance with the entries. The developer should be rather weaker in reducer than accelerator, and, for ordinary work, might with advantage be dilute, tele-photographic negatives generally requiring more vigorous treatment. Two slides were shown representing the crypt of St. Peter's, Oxford, one negative having received an exposure of two hours twenty-four minutes, and the other an exposure which, under similar conditions, would have been equal to fifty minutes, the former giving a truer rendering of the place. For artificial light he preferred magnesium ribbon, unequal lengths being burned on either side of the subject. Doorways would generally look best with the door party open. When ornaments were to be considered, it would generally be advisable to place the camera centrally rather than to take a side view. Where doorways had rounded or square pilasters, elaborately carved, they should be photographed from two points of view, one being taken from a position at right angles to the other.

Mr. F. H. EVANS asked Mr. Marriage whether, when tilting the camera with the tele-photographic lens, it was necessary to use a very small stop. Personally, he preferred to use the rising front, as far as possible, rather than to tilt the camera. He could not understand why it should be necessary to dilute the developer for tele-photographic work when a full exposure was given.

Mr. H. W. BENNETT thought the suggestion as to the preparation of a rough plan of an interior was a valuable one, but that there should be added to the plan an indication of the position of surrounding exterior objects, such as trees and buildings, the proximity of which might materially affect the exposure. He said that he had had to develop a number of plates exposed by means of magnesium ribbon on subjects similar to some of those shown by the lecturer, and had experienced considerable difficulty in obtaining density in the negatives, and asked whether Mr. Marriage had found such a difficulty arise when using magnesium. With regard to the question as to the best point of view from which to photograph a doorway, it appeared to him that a central view did not show so much relief, or light and shade, as one taken from the side. He thought that the use of the swing back and tilting the camera was not so satisfactory as having a large range of rising front.

Mr. H. SNOWDEN WARD had hoped to have heard more about interior work, which involved greater difficulties than photographing of exteriors. For focussing in awkward situations, the use of a mirror in front of the lens, as in photo-mechanical work, was a distinct advantage.

Mr. H. BEDFORD LEMERE said that his experience was principally concerned with interior work, for which he found the magnesium light very useful. As an example of his method of employing it, he mentioned that, in photographing the late Lord Leighton's Arab Hall, a most difficult subject, he gave an exposure of about three and a half hours, at the conclusion of which he picked up the detail, and got some high light by using a magnesium-ribbon lamp for two or three minutes.

Mr. FERGUSON asked how Mr. Marriage overcame halation when photographing a dark interior of a church with a very light east window?

Mr. CLEMENT MILLARD said halation might be caused by over-exposure, by stray pencils of light from an uncorrected lens producing local halation on the front of the film, or by the reflected image from the back of the film; and he had found that, for the prevention of halation, an unbacked plate was better than a backed one, an opinion which he fortified by the exhibition of negatives of interiors taken on plates without backing. He entirely disagreed with the use of ordinary plates for interiors, and contended that, with a full exposure on a rapid plate, and by employing a strong developer without bromide, it was possible to bring up an image on the front of the plate absolutely free from halation. He used a pyro-potash developer, in the proportion of one grain of pyro to six grains of carbonate of potash per ounce. He preferred a flashlight to magnesium ribbon, as the latter caused so much smoke and dust; but the best method of artificial lighting was a system of mirrors, from which a powerful light could be reflected on to portions of the subject.

Mr. WOUNACOTT, referring to the question of obtaining a firm stand, suggested the use of short brass tubes to fit on the extremities of the tripod, and provided with spikes for wooden floors, &c, and small indiarubber balls for polished surfaces. He also advocated the inclusion of some sort of scale in architectural photographs.

Mr. J. MACINTOSH pointed out the assistance in focussing which was obtained by cutting the ground-glass screen in slips, and using a focussing glass between the spaces. If he were doing much architectural work, he would prefer not to tilt the camera, but would level the baseboard, set the back upright, and have a rising front of abnormal range.

Mr. W. E. GRAY alluded to the advantage arising from the use of a colour screen for interior work in foggy weather.

Mr. W. E. DEBENHAM preferred not to use the swingback, except under exceptional circumstances, and advocated square bellows, high rising front, and a lens of enormously wide angle, with an extremely small stop. He could not see why a magnesium flash should cause less smoke than magnesium ribbon, nor why there should be any difficulty in obtaining density on a plate so exposed.

Mr. MARRIAGE, replying, said he preferred not to use the swing back, but with the tele-photographic lens it must be brought into requisition. He had not noticed any loss of definition when the camera was tilted and the back considerably swung, the tele-photo lens being very much stopped down. In preparing a rough plan of a building, he did not think it necessary to mark the position of surrounding objects, as he used a Stanley's sensitometer for calculating exposures. When using magnesium, he had not found any difficulty in obtaining density if the exposure was correct. His method for avoiding halation from a window was to avoid the window. The suggestion as to including a scale in the photograph was a good one, but there were difficulties in the way when one was photographing capitals and detail at the top of columns, as in many of the slides shown.

The CHAIRMAN pointed out that, in using a telephotographic lens, under conditions similar to those obtaining in Mr. Marriage's work, the pencils of light proceeding from it were so exceedingly attenuated that the swing back might be used to a vast extent without putting the image materially out of focus.

The meeting, which was largely attended and continued to a later hour than usual, terminated with the passing of a hearty vote of thanks to Mr. Marriage.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 21,—Mr. Bedding in the chair.

Mr. E. H. BAYSTON showed a bromide paper print which had been developed with several others in an amidol and sulphite developer. The print in question had gone yellow round the edges. In reply to a question, he said he had not given more than a rinse between the developer and fixing bath.

Mr. J. E. HODD had met with similar cases, and attributed it to the superficial washing given to the print. Amidol necessitated a more thorough washing between development and fixing.

Mr Paul Martin gave a lantern display, consisting of a miscellaneous selection of street scenes, land and seascapes, breaking waves, and sunrise and sunset effects. Several were carbon slides of various colours, and a few in red chalk. After a number of Swiss and Channel Island views, Mr. Martin closed with the now famous slides, *London by Gaslight*. Most of these were taken about an hour and a quarter after sunset, with exposures varying from twenty minutes to three-quarters of an hour. He mentioned that his plates were all backed. The effect of twilight to be seen in some of the views was due to the slight remaining actinic power of the light and the prolonged exposure.

Mr. E. J. Wall brought the evening to a close with a number of slides by some well-known workers, amongst whom were Edgar G. Lee, Mrs. Francis Clarke, J. E. Austin, G. Hankins, A. R. Dresser, and A. Stieglitz.

The HON. SECRETARY announced that the paper by Mr. Debenham had been wrongly described. The correct title was *The Stigmatic Lens and its Use*.

PHOTOGRAPHIC CLUB.

JANUARY 20,—Mr. Mackie in the chair.

Mr. Tottem passed round samples of Gihon's opaque, a red paint useful for blocking out lantern slides and for similar work.

Mr. H. Erny was duly proposed and seconded for membership.

Mr. CHAPMAN JONES delivered his lecture, entitled

NEGATIVE-MAKING.

He urged the necessity of truthful representation in photography. A representation, said he, is true when it conveys a true representation of the object presented. Dealing with the lenses used for negative-making, the lecturer said it was important to use lenses which did not distort. Single lenses, which have some advantages, may be used for rectilinear subjects under proper conditions. The best position for the diaphragm is in front of a single lens, as by this arrangement errors which may arise from distortion in the optical system are more or less counteracted by the use of the plane surface of the dry plate. The insufficiency of the ordinary text book diagrams dealing with this subject was made clear. Three rules for securing correct representation were—that the plate should be vertical, that not too wide an angle should be included, and that the photographer should keep far enough away from the object. Dealing with exposure and development, Mr. Chapman Jones said that there is an exposure, or a small range of exposures, which will give the maximum density. Plates are more or less rapid according to the developer used. He knew of no means so good for ascertaining what the exposure should be as Watkins's system. He ridiculed the method of observing the image upon the focussing screen as a guide to exposure, stating that in the first place no reliable opinion could be formed, and that, if it could, it would not prove anything. A perfect negative was stated to consist of pure metallic silver embedded in clear gelatine; it should be free from reduction products. He recommended the use of normal sulphite of soda in preference to an acid sulphite. The strength of the sulphite should be in proportion to the bulk of the developing solution, without bearing any necessary relation to the strength of the reducing agent. He recommended the addition of sulphite of soda to the fixing bath, which should never be acid. For a fixing bath he gave the following formula:—

Hyposulphite of soda	16 ounces.
Sulphite of soda	1 ounce.
Carbonate of soda	½ ,,
Water	80 ounces.

The hypo fixing bath should be prepared twenty-four hours before use, and a second fixing bath was recommended. For development purposes, he recommended carbonate soda as alkali. Upon the subject of exposure the lecturer stated that it may be exhaustive or selective, the latter giving greater scope for skill. He referred to Watkins's discovery that the time occupied in the first appearance of the image may be used as a factor for the time necessary to get full intensity. In his opinion, metol and amidol would give sufficient density if time enough be given. Dealing with the washing of the negative, Mr. Chapman Jones thought that a certain amount of soaking was essential; no amount of running water could obviate its necessity. Concluding, the lecturer stated that he regarded the negative as a tool in making a print. Negatives which did not yield perfect prints could not be regarded as perfect negatives, but a negative from which a perfect print could be obtained was not necessarily itself perfect.

A discussion ensued.

Mr. FRY said that any remarks he should offer upon a paper which was not intended to open a debate would obviously be of the nature of comment rather than of criticism. He thought that the lecturer had drawn a wrong inference from the statements made by some photographers that they judged the exposure by looking at the focussing screen. His impression was that many workers came to a conclusion which could only be rightly described as intuitive. One of their habits was to look at the focussing screen at the last moment, but he doubted whether this was really more than a coincidence. During the act of preparing for the exposure the photographer's mind would be working towards a certain point, viz., the exposure, and he thought that the final look at the focussing screen partook more or less of habit, the mental decision having been arrived at, perhaps unconsciously, previously. As Mr. Chapman Jones had, however, gone a step farther, and said that, if a photographer could decide the exposure in this way, it would not prove anything, it was not necessary to consider it farther. Referring to the question of a pure image in clear gelatine, the speaker thought that the lecturer had not given sufficient importance to the value of colour both of deposit and gelatine. That characteristic of a print which was known as quality was more difficult to obtain from a negative which printed very quickly than from one which required a rather longer printing time. The perfect negative referred to would be very difficult to make.

Mr. DOCKREE, a visitor, asked the lecturer what part the bromide played in development, and whether it was really necessary to use a salt of ammonium as restrainer when liquor ammoniæ was the accelerator?

Mr. BALDOCK, a visitor, asked the lecturer if he had noticed that an unexposed plate placed in the developer seemed more liable to chemical fog than a well-exposed one?

Mr. HANA said he relied mainly upon instinct both for exposure and development, but he generally looked at the ground glass at the last moment to ascertain that his picture was in the proper position on the plate. He found a little fog was useful for certain purposes. He agreed with the lecturer that there was no difficulty in getting density with the new developers. He thought that the character of a negative should be determined by the nature of the subject.

Mr. BRIDGE said it was a pity they could not see the negatives from which some of their medal pictures were made. He expected that some of the best pictures would not be found to be produced from very good negatives in the technical sense of the word.

Mr. MACKIE, referring to the lecturer's statement that an acid and alum bath does not remove the stain, but merely lightens its colour, which it also fixes, asked if there was any objection to a negative so treated? He took exception to the use of the word mud or muddy in connexion with negatives which were either stained in development or had a compound image.

Mr. HAES had used an alum bath between development and fixing for many years with good results, but the lecturer suggested that he should abandon the habit.

Mr. WELFORD said that he did all he could to get a stained negative. His object was not to obtain a perfect negative, but a good print. He thought it inadvisable to consider the negative at all. He desired no limitation as to what was pure photography, or what was permissible, or the reverse. He also objected to the use of the word mud, but he should himself continue to make what had been described as a muddy negative as long as he possibly could.

In reply, Mr. CHAPMAN JONES said he knew that a perfect negative was a difficult thing to produce. He had had it stated to him definitely, by both professional and amateur photographers, that they judged the exposure by looking at the ground glass. He preferred to use a salt of ammonium as restrainer when liquor ammoniæ was used as accelerator, and potassium bromide when a potassium compound was used as accelerator. If fog was to be introduced for a definite purpose into the negative, it was also essentially necessary to know how to exclude it. He had no doubt that Mr. Welford worked largely with short exposures, and it was probable that there was not enough light action to produce the image in silver, and he produced a compound image; if he only desired to get a print, and then to have done with the negative, that would be sufficient. He objected to the use of alum. Plates seldom required it now. He did not think there was much difference between himself and the several speakers, whom he thanked for their remarks.

Mr. BRIDGE proposed a vote of thanks. He said the Club had been fortunate in getting Mr. Chapman Jones to come before it to read his affiliation lecture. This was a great advantage, and had led to an interesting discussion, which would possibly in other circumstances not have taken place. This was the third affiliation lecture read before the Club, and in each case they had been fortunate in securing the attendance of the writer of the paper.

Mr. FRANK HAES seconded, and the vote was carried by acclamation.

MANCHESTER PHOTOGRAPHIC SOCIETY.

January 14,—Mr. T. Chilton in the chair.

Mr. F. EDWARDS exhibited and described his enlarging apparatus for

THE CORRECTION OF LEANING LINES IN ARCHITECTURAL SUBJECTS.

The illuminant was the albo-carbon light, and it was found to be satisfactory.

A great range of focus is a necessity, in case the apparatus is to be used either for enlarging or making lantern slides. Mr. Edwards then described the method of sloping negative and also the board carrying the sensitive paper, which was very ingenious.

Mr. WHITEFIELD then made a few remarks as an addition to Mr. Edwards's paper on the subject of the illuminant and objective. For even illumination a large stop should be used, but then definition suffers, so the best plan is to stop down until there is just a trace of blue in the centre, as, such a colour being actinic, is not of much disadvantage.

Mr. CHILTON mentioned that an exhibition of members' work is to be held in March, when a good array of pictures is expected.

North Middlesex Photographic Society.—January 25, Mr. Mummery the President) in the chair.—The following gentlemen were nominated for membership: Messrs. H. Holmes, A. G. Lawson, E. C. Parker, J. Wilson, W. D. Williams, and Snell. A large audience was present to hear Mr. F. H. EVANS give his lecture on

LINCOLN CATHEDRAL.

It was illustrated by numerous lantern slides of the exterior and interior, and details of various carvings and sculpture. The lecturer described each slide as it was thrown on the screen, and gave many interesting facts about the Cathedral, historical and descriptive.

Polytechnic Photographic Society.—January 21.—Three negatives were enlarged to 12×10 positives on bromide paper. One was enlarged six times and the other twenty-four times. A three-wick lantern was used, and, to show the enormous difference in exposures, one was given twenty-five seconds, and the other one minute thirty seconds. The lecturer stated that the exposures ought to be reversed according to the number of times enlarged; but, owing to one negative being extra thin and the other extra dense, the ratio was entirely overbalanced, and he thought, from his experience, it was by far the best to always test the exposure on a strip of paper first. Eastman Rapid paper was used, although costing more than other makes, was more certain in results. The Eastman developer, when carefully made, could not be improved upon. On February 4 we shall be favoured with a paper from Mr. Wolfgang Arndt on *Retouching*, with pencil illustrations. A full audience is required on this occasion. The number of fully paid members now reaches thirty.

South London Photographic Society.—January 18, the President (Mr. F. W. Edwards, F.R.P.S.) in the chair.—Mr. W. FENTON-JONES (Hon. Secretary of the Hackney Photographic Society) attended, and gave a very instructive and pleasing lecture, illustrated with a large number of lantern slides, entitled

VENICE AND LUCERNE.

A number of slides by Mr. Howard Esler, illustrating the scenery of County Antrim, were then shown.

Woodford Photographic Society.—January 21, Mr. E. Marriage in the chair.—Mr. H. W. BENNETT was called upon to read his affiliation lecture upon

ARCHITECTURAL PHOTOGRAPHY.

The lecture is very comprehensive in character, particular stress being laid upon the need of good apparatus if the best results are desired. The style of camera, with its various movements and fittings, lenses of different focal length, angle of view, and flatness of field, tripod, tilting table, &c., all receive careful consideration. A good deal of wholesome advice is given as to plate and exposure. The last part of the lecture is illustrated by some slides of beautiful examples of architectural photography, each of these slides being used to illustrate some point of lighting, angle of view, question of exposure, &c.

Birmingham Photographic Society.—January 22, Mr. William Jones in the chair, and about thirty-five members present.—Mr. C. S. BAYNTON read a paper upon

ENLARGING,

by John A. Hodges, F.R.P.S. In the matter of artificial light, the writer considered the incandescent gas light a very suitable light for enlarging, and infinitely superior to any form of oil lamp. The method of illumination of the negative was shown by a series of diagrams, as was also a form of camera to be used for enlarging by daylight. The class of negative most suitable for enlarging from by artificial light was considered to be one having a full range of density, with, perhaps, a tendency towards thinness, as no form of artificial light was sufficiently powerful to penetrate a dense or hard negative. Development was next considered, and, for bromide work, ferrous oxalate was, in the estimation of the writer, by far the best, though he admitted very good results were obtained by development with amidol. In the production of enlarged negatives slow plates should be used, and slow dilute developer. In making transparencies it was best to obtain the slowest transparency plates, and by far the best results were obtainable by making an enlarged transparency, and the negative afterwards by contact, as, by that means, it allowed of much work in the nature of retouching being put upon the transparency before making the negative. At the conclusion of the paper, Mr. Baynton demonstrated the making of acetylene gas, and, when the light was put into the optical lantern, produced very satisfactory results upon a small screen.

Leeds Camera Club.—January 20.—The fifth of the above Society's series of lectures for beginners was given by Mr. C. C. VEVERS, whose subject was

PORTRAITURE AND GROUPING.

Mr. Vevers treated this branch of the photographic art in an exhaustive manner, dealing first with single-figure subjects in full length, half, and head and bust positions, and afterwards with the management of large and small groups. The lecturer illustrated his remarks with some forty or fifty lantern slides, showing a variety of examples in the many styles of portraiture, criticising each, and explaining the rudiments of composition and lighting, and how to overcome many of the difficulties that beset the amateur in his first attempts at portraiture. Mr. Vevers contended that, with the aid of suitable reflectors and diffusing media, equally as good results may be secured in an ordinary room as can be obtained in a properly equipped studio, and, in proof of this, he showed examples taken by the light of an ordinary bedroom window, to secure which he had used a "diffuser" of his own design, which he also exhibited. He also showed a cleverly devised folding portable "studio" for outdoor use, which can be constructed at little cost, fitted with sliding curtains on top and both sides, by means of which any desired lighting is obtainable. The idea is a good one, and will prove of much service to amateurs for garden or lawn use.

Leeds Photographic Society.—Hunslet possesses no special attraction to the amateur photographer excepting, possibly, in respect of its great industrial establishments. That, however, did not prevent the Leeds Photographic Society having their annual social evening and photographic exhibition in Hunslet Mechanics' Institute on Tuesday, January 19. Their President (Mr. Peter Gilston) invited them there because, as he told them in a characteristic little speech, he looked upon Hunslet as the "hub end of Leeds," and the Society's work as "a missionary work." The hall of the Institute had been adapted for the comfort of about 300 guests, and a number of pleasing entertainments were provided. To begin with, there was an interesting and varied display of framed photographs—nearly 200 altogether—and these included specimens for which the Society had awarded medals. The silver medal went to Mr. C. R. H. Pickard for a fine bromide enlargement of a view of the Rapids of Niagara, Mr. A. A. Pearson gaining the bronze medal for the silver print of Jungfrau. An enlargement of a portrait, by Mr. T. A. Wright, a platinotype of a Yorkshire coast subject by Mr. W. Denham, cathedral interiors by Mr. F. Waddington, and a silver print of a scene in Conway Valley by Mr. Godfrey Bingley, all received commendation. Medals were also given for the best lantern slides, and Mr. Godfrey Bingley secured the highest honours with a set which comprised charming views in Yorkshire, Wales, and Scotland, Mr. W. Denham taking the bronze medal for a set composed chiefly of sea scenes at and near Whitby. Mr. G. H. Rodwell's photographs of flowers were commended. Mr. and Mrs. Gilston received the company at seven o'clock, and afterwards refreshments were served, followed by vocal music, a demonstration with the kinematograph, also a display of the prize and other lantern slides by Mr. A. W. Atkinson. The vocalists were Madame Goodall and Mr. John Browning. Mrs. Denton accompanied on the pianoforte. Great interest naturally centered in the kinematograph, which was shown by Mr. S. J. Beckett, from the Polytechnic Institution, London. The "living pictures" numbered sixteen, each series being made up from 1100 to 1500 photographs, and they were successfully projected on the screen at the rate of about twenty per second. The selection was a varied one, and afforded delight to the large gathering. Among the guests were the Vicar of Hunslet (the Rev. Canon Thompson), the Councillors for East and West Hunslet, Mr. J. H. Wurtzburg (Chairman of the Leeds School Board), Dr. Forsyth, Councillor Howgate, also Mr. Herbert Denison and Mr. B. A. Burrell (the two Vice-Presidents of the Society). The arrangements, for which the Committee (Mr. A. Naylor, Hon. Secretary) were responsible equally with the President, afforded much satisfaction to all present.

Sheerness Camera Club.—January 18.—Annual Meeting. Mr. J. J. King Salter presided in the chair.—Balance-sheet was read and passed. Mr. E. J. White, Hon. Secretary, to whom great credit is due for the efficient manner in which he fulfilled the duties of that office, resigned; Mr. J. J. King Salter was re-elected President, and Mr. Small Vice-President; M. J. O. Flynn elected Hon. Secretary; Mr. Hughes, Treasurer; Messrs. Shutt, White, and Jago, Committeemen. A vote of thanks was proposed to Mr. Millard, C.E., F.R.P.S. (who was present) for his most instructive lecture on Malta. That gentleman, in his acknowledgment, said he was much pleased at the large and appreciative audience which gave him such a hearty reception, and wished the Club every success. He also pointed out that photography had a great future before it, and spoke very highly of the beautiful scenery that Sheppey afforded, and of his intentions to pursue its studies.

Wakefield Photographic Society.—January 22.—The Hon. Secretary reported that the Society had been admitted to affiliation by the Council of the Royal Photographic Society. Messrs. A. W. Stansfield, J.P., and Isaac Briggs, jun., were elected delegates to the Affiliation Committee. The thanks of the Society were recorded on the minutes to the Rev. A. Addison and Dr. Clarke for kindly presenting to the Society the four medals recently awarded for prints and lantern slides. Mr. C. MILES read a paper entitled—

AN AMATEUR'S DIFFICULTIES.

Mr. Miles considered that the greatest difficulties an amateur had to contend with were exposure, uneven development, *i.e.*, one negative dense, the next thin, prints too light, over-toned, and sensitive paper getting damp, also the difficulty of judging the ratio of exposure between an object when 100 yards away and when close to. The exposure difficulty is solved by the use of an actinometer, especially one furnished with sensitive paper, that of development by the adoption of Mr. Watkins's method of timing development. These and the other points raised gave rise to an animated discussion, which was taken part in by all the members present.

Kilmarnock and Ayrshire Photographic Society.—January 16. Mr. Robert Gudgeon, Netherby, Ayr, presided.—Mr. Walker, the representative of Messrs. Read, Holliday, & Sons, Ltd., 188 West George-street, Glasgow, gave a most successful demonstration with the acetylene light.

FORTHCOMING EXHIBITIONS.

1897.

February 1–27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

February 8–13 ..... Photographic Society of Ireland. Hon. Secretary, Victor E. Smyth, 35, Dawson-street, Dublin.
" 25–27 ..... Woolwich Photographic Society. Hon. Secretary, F. W, Machen, 161, Griffin-road, Plumstead, S.E.
March 6–13 ..... South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"THE SOUL OF TRADE."

To the EDITORS.

GENTLEMEN,—As a late assistant to one of the cutting firms, will you kindly allow me space to confirm in every way "An Old Wet-plate Photographer's" letter published in your last issue, in which he states the cutting firms "are not doing half the trade they have done." This is quite true, for, at the branches where I was employed, the takings have gone down "something awful." No doubt the public are beginning to understand the system under which this cheap work is turned out; but what the poor devils of assistants I have left behind cannot understand is why they are growled at for the falling off of business. This falling off means the order of the sack to a number of hands, and half pay to a number of others, and so this firm "squeegees" cash out of their assistants to make up for bad trade. This is one of the many bad sides of the cutting prices, and the more publicity is given to the system under which the cutting prices are maintained the better it will be for the profession and the public generally. Thanking you for opening your columns for the discussion of this question,—I am, yours, &c.,

FAIR PLAY.

To the EDITORS.

GENTLEMEN,—I have been a regular recipient of your valuable journal for ten years, but have never before seen so many complaints from professional photographers about the "cutting of prices," "cheap enlargements," &c. Under the head *Soul of Trade*, in this week's issue, I notice two letters alluding to the offer of "good permanent enlargements for 6*s.* 6*d*," &c. It may be that these gentlemen suffer to some extent from the cheap work referred to; but my experience has been the reverse. Meritorious work demands its price, and during the seventeen years I have been in business here I have from time to time *increased my prices*, and that in face of the fact that each new comer to this city, in his turn, cut down their prices in order to divert trade. I have, however, always found, when any of my customers were allured by such "Will-o'-the-Wisps," they soon returned, more willing than ever to pay my prices—viz., *cartes-de-visite*, 10*s.* 6*d.* a dozen; cabinets, 21*s.* a dozen; and enlargements at proportionate prices.

If we pay steady attention to business, and produce good work, we can sail along successfully, in spite of professional dodgers or newspaper printers.—I am, yours, &c.,

THOS. MILLS.

The North Wales Art Studio, Bangor, North Wales.

A BITTER CRY FROM GLASGOW.

To the EDITORS.

GENTLEMEN,—If Glasgow has flourished by the preaching of the Word, it cannot now be said to be flourishing as regards the progress and advancement of its oldest, and, indeed, the premier, Photographic Association of Scotland.

With your permission, gentlemen, I shall endeavour to describe the kind of meeting a Glasgow Society held this week, leaving it for the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to judge whether or not we in the far north are backsliders. In the first place, I may say that the members of the Society are professional photographers, for the most part, with the usual sprinkling of honorary members, whose avocations vary from architecture to wholesale dealings in wines and ardent spirits. But that is another story. The large hall was crowded, and the subject of the lecture *Photography*—an omnivorous enough title and savouring of shop; but the titles of lectures, as it is well known, are misleading.

Now, it would have been of interest to professional photographers to learn something of the progress of photography in China, Peru, Greenland, or even Franz Joseph Land; but, when the lecturer, in the first half-hour, regaled his audience with the story of the advancement of photography in these islands, as has already been done *ad infinitum* and *ad nauseam*, with the story, I say, which the veriest tyro in photography has read in any photographic annual, then a great feeling of disappointment spread through the meeting, and curses were loud and deep. Again, the lecturer went on to show the meeting how to place a slide in a camera, how to handle a printing frame, and how to produce a transparency for a magic lantern.

It is only fair to state, however, that there was a Röntgen-ray exhibition and a cinematograph included in the programme; but I ask if it is in keeping with the progress of the times that an association of professional photographers should be asked to attend a lecture which must evidently have been intended for the veriest amateurs and beginners?

I have no desire whatever to disparage the efforts of the lecturer, who, doubtless, meant well; but I should like to ask where were the wits of the Lecture Committee and Executive when they made arrangements for such a primitive discourse on photography? A blunder such as this on the part of the Executive may nearly prove fatal to the further advancement of the Association, while it is almost certain to be the cause of the withdrawal of a number of members, who have no time to waste in hearing again the A B C of their art recited from the lecture desk.—I am, yours, &c.,

SAINT MUNGO.

THE INSTITUTE OF PHOTOGRAPHIC ARTISTS.

To the EDITORS.

GENTLEMEN,—From a cutting from THE BRITISH JOURNAL OF PHOTOGRAPHY which has been sent to me, I see that the name H. H. Robinson "figures on the prospectus" of the Institute of Photographic Artists amongst those of persons whom you are "unable to associate in any way with photography." I may be the H. H. Robinson mentioned. If so, my name has been used without my authority. I never heard before of the Institute of Photographic Artists, and except that, like everybody else nowadays, I spoil a few plates occasionally, I am in no way connected with photography. The name has probably been taken from catalogues of the Royal Academy or other exhibitions of paintings.—I am, yours, &c.,

H. HAREWOOD ROBINSON.

Hotel Victoria, Northumberland-avenue, London, W.C., January 26, 1897.

[The "H. H. Robinson" of the prospectus referred to has the vague address of "Brondesbury, N.W." We are obliged to our correspondent for his disclaimer.—EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Werner & Son, 39, Grafton-street, Dublin.—*Two photographs of the late James Poole Maunsell, Esq.*

MEALY PRINTS.—The mealiness is due to over-toning. The paper you are using will evidently not bear toning beyond a brown stage.

W. STOCKS.—1. We do not undertake enlargements. Better address Messrs. Wellington & Ward, Elstree, Herts. 2. Of artists' colourmen, we believe.

CONDENSER.—W. WARMAN. For slides of the ordinary size, a four-inch condenser will be much better than a five-inch one, notwithstanding the advice given you.

ALDINE.—Judging by experience of shorter-foci lenses of the same make, the instrument you name is an excellent one, and can be recommended to work as well as it is said to do.

UNITED STATES.—TRAVELLER. As the apparatus is not new, and you are going to use it in the States for taking views, it will be admitted, as your personal luggage, duty free.

PIRACY.—PHOTO. If you are able to prove that the picture was painted from one of your published views, you can certainly recover a penalty from the painter, as well as forfeiture of the picture.

C. E. HANLON.—1. You would not be liable to prosecution. 2. You could not patent the ink itself, but possibly an application thereof might be fit subject-matter for a patent. Ask a patent agent.

WORK ON PHOTOGRAPHY.—AMATEUR. Mr. Jabez Hughes has been dead many years. The later editions of his work on *Photography* were edited by Mr. J. Werge. The work is not in print now, we believe.

R. SMITH.—It is not, we believe, obtainable retail. Application to the Somerset House authorities will bring you a statement of the conditions under which it may be had in quantities of several gallons, we fancy.

LOCOMOTION.—1. Probably H. P. Robinson's *The Studio and what to do in it* (published by Sampson Low & Co., Fetter-lane) would be the most serviceable to you. 2. It would, no doubt, answer; one ounce, possibly, would suffice.

STAINED PRINTS.—INQUIRER says: "As there is a difference of opinion in my establishment regarding the cause of stains on enclosed prints, will you kindly let me have your opinion?"—The stains are due to imperfect fixation, and that without doubt.

PORTRAIT LENS.—NOVO. For cabinet portraits a lens of from twelve to fourteen inches' focus should be used. If one of shorter focus be employed, the camera must be brought nearer the sitter, then the perspective becomes too violent to be pleasing.

W. SYKES.—By selling the pictures you would render yourself liable to an action. Claim your money back. There is very little doubt that the artist will repay you, as you are both in an awkward position, and had better get out of it as soon as possible.

NEGATIVES FROM NEGATIVES.—M. S. We presume that it is intended to make the exposures by contact in the printing frame and to daylight. In that case, and using an ordinary plate, we found that an exposure of from six to eight seconds produced good results.

BOOKS ON PHOTOGRAPHIC CHEMISTRY.—NEMO. Leaper's *Materia Photographica* (Iliffe); Meldola's book (Macmillan), supplemented by an elementary book on inorganic chemistry, should help you. The tests for photographic chemicals are described in a little work published by Carter & Co., Furnival-street, E.C.

HARRY'S RETOUCHING DEVICE.—RETOUCHER says: "Can you inform me of a firm that retail's 'Harry's Improved Electric Retouching Device,' and also give me some idea as to the price of same?"—In reply: The agents are, we believe, Messrs. O. Sichel & Co., 52, Bunhill-row, E.C. The price, we believe, is 5*l.* including battery.

ANDERSON BROTHERS.—Sorry that the information you ask is hardly in our power to give. We printed the paragraph as we received it, and, in regard to your queries, could only hazard purely theoretical replies. However, in next week's JOURNAL, there will be a further reference to the matter, which may be serviceable to you.

CHEMICAL FOCUS.—INQUIRER. At one time it was held by many, and by Voigtlander amongst the number, that a lens with a separate chemical and visual focus was advantageous, but that opinion has been abandoned long since. All lenses are now made with the two foci coincident, except in the case of errors in the manufacture.

ENRICHING PARAFFIN OIL.—R. CRAWLEY. Opinions are somewhat divided as to the advantage or otherwise of adding "albo carbon" to paraffin oil that is to be used in lanterns. Some say that it increases tendency to smoking, and sometimes adds to the smell. Others say the contrary. Something may, however, depend upon the lamp itself and the way it is used.

A SUSPICIOUS TRANSACTION.—DOUBTFUL. As a fortnight has elapsed since you sent the apparatus on approval, and you have heard nothing of it since, and can get no answer to your letters, we advise you to write, without delay, to the Superintendent of Police for the district to which it was sent, stating the circumstances. You were unwise in sending the things without the cash, or a good reference, being received beforehand.

COPYRIGHT.—T. B. J. says: "I have a very old view of this town, probably a hundred and fifty years old. As this is believed to be the only one in existence, can I, if I publish photographs of it, prevent others from copying them, as there can be no copyright in the engraving?"—Yes, if you make your photograph copyright, the law will protect you; but it will not prevent any one else copying any other print of the same subject if they can obtain one, or yours, if you allow them the opportunity.

LIGHT FOR ENLARGING ROOMS.—E. S. (Forres) asks: "Will you kindly say, through the medium of your Query column, the safest light for an enlarging room, the room being lighted from another? Please say if glass or fabric is best. I have an apparatus carefully arranged, and want everything as complete as possible; also safest light for developing room where gas is used."—Under the conditions, one thickness of glass, deep orange pot metal, will answer, and be a pleasant light to work by in both rooms.

RESIDUES.—RESIDUE says: "You were very kind in answering a few questions for me in the JOURNAL some little time ago, which was of great help to me. I again venture to ask another on the same subject. 1. I save the hypo from the fixing of plates in a large jar, and add liver of sulphur, dissolved in hot water. The deposit, after the hypo is drained away, is very dark. I dried it, and tried a little on charcoal with a blowpipe, but failed to get silver. A very strong smell of sulphur came away on being heated. Should this deposit be washed in any way? If so, is it merely to be well stirred in clean water, say, about a gallon or so, and allowed to settle again? 2. Is the deposit sulphide of silver? 3. Will sulphide of silver, or the residues from above, melt out into metallic silver in crucible in a furnace, with flux equal quantities of soda carbonate and potassium carbonate?"—In reply: If the heat of the blowpipe (reducing flame) had been continued long enough, with flux, the silver would be reduced to the metallic state. It is well to wash the precipitate, though not really necessary. 2. Yes. 3. Yes; but it is a good plan, when the contents of the crucible get to the liquid state, to drop into it, one at a time, a few *small* pieces of nitrate of potash.

PASSPORT, &C.—AMIENS says: "As I purpose going to Paris and the North of France in the spring, I should be much obliged if you could inform me in your Correspondents' column where I can obtain a passport, and the cost, if any? Also, can you tell me if it is necessary to get permission to photograph in and around Paris and provincial towns, such as Amiens and Rouen, and, if so, to whom shall I apply?"—Passports are obtained from the Foreign Office. Write, enclosing stamp for reply for an application form. The cost, we think, is about 1*s.* No permit is necessary, we believe, for the streets of Paris; but there is for the environs, which is to be obtained of the Commander-in-Chief.

THE HALF-TONE PROCESS.—SNARK says: "I should be much obliged for the following information:—1. Is the business of a process-block maker likely to be a fair opening for a small capitalist, with, say, about 1000*l.*? 2. Are all the good half-tone processes the subject of patents? 3. Having a good knowledge of general photography, would the half tone process, &c., present great difficulties? would about a year's study ensure a fair proficiency?—In reply: 1. Yes. 2. No; the processes are practically patent-free. 3. To a clever photographer the difficulties should not be very great. In twelve months he should be able to turn block work of first class quality. Shall be pleased to give any further information we can.

PHOTOGRAPHING SILVER CUPS.—C. CROSS writes: "I expect shortly to have to photograph a number of silver prize cups and vases. Can you give me any hint as to how to avoid reflections from the burnished parts and show all the details?"—A very general way is to "dab" the surface over evenly with a lump of tolerably firm putty. This can readily be washed off, after the negative is secured, with warm water and soap. Sometimes, however, the owners will not permit this treatment, then the next best plan is to make the studio tolerably warm, and then, after all is arranged, to introduce into each of the vessels a lump of ice. This, by suddenly cooling the metal, will cause moisture to condense on the surface as dew, and thus dull it. As soon as the surface is dulled, the negative must be secured, as the continued condensation of the moisture will cause it to collect in tears.

ALBUMEN PRINTS.—ALBUMEN says: "1. Prints that have been toned and washed all night, mounted and pressed down by blotting-paper, are matt surface till they begin to dry. I am told they should be more glossy then than after. Is this so? 2. Can you tell me the cause of brown margin round a vignette—I mean the shading off between the picture and white paper? Bath has recently been shaken up with kaolin, sunned, and made up to fifty grains, and one drop of ammonia added. Paper floated five minutes during this frosty weather, and four minutes during cold weather."—1. Usually the prints are more glossy when dry than they are when first mounted. 2. The vignetted margin should be white. Discolouration may be due to the paper being exposed to light, either before or while printing, or perhaps while the prints are being washed or toned. If the paper has become discoloured through keeping, pure whites must not be expected.

J. T.—The essence of Rapp's directions was given in the paragraph. We take it that glycin or metol, with or without an alkaline carbonate, are available. However, we can refer you for full details of the method of stand development to Meydenbaeur's original paper, which appears in the JOURNAL of December 9, 1892. Lest you cannot place your hand on that number, we may say that he briefly describes the principle involved as being "the prolonged action of a very diluted developer contained in a dipping bath, which, being provided with grooves, admits the simultaneous treatment of several plates." For ordinary work he gives this formula:—

1 : 10 solution soda sulphite	100 parts.
1 : 5 ,, potassium carbonate	100 ,,
Water	10,000 ,,
Dry pyro	2 ,,

For instantaneons work:—

1 : 10 solution soda sulphite	100 parts.
1 : 5 ,, potassium carbonate	100 ,,
Water	3,000 ,,
Dry pyro	1½ ,,

BUILDING.—SEKAON writes: "I have recently taken the above premises, with the object of opening a studio, which I have moved from my last place of business. First of all, I have my landlord's consent to erect it and also a show-case; have been to the District Surveyor, and he referred me to the London County Council, as I was not disposed to build it as he would require it to be done, viz., half the superficial area to be nine-inch brickwork from ground floor to eaves. As erected before, it was 24 feet long, 12 feet wide, and 7 feet 9 inches from floor to eaves, match-lined inside all round 3 feet up, and corrugated iron on outside to the same height; it was built on solid brick piers, and has 2½ × 7 joists, resting on 4 × 4 plate. Have already wasted a deal of time and money—for time is money—in dealing with the London County Council. What I am anxious to know is this: Can I, by putting the basement, by which I mean the floor, joists, and 4 × 4 plate, on wheels, so that it is portable, avoid going to the London County Council for consent? Am told such a means would do so. Have been reading up the new building Act, but cannot gather anything on that head."—It is very clear that the old studio contravened the Building Act. Putting the studio on wheels will not help matters at all, as it will not then be exempt from the Building Act. Refer to the Building Act you have, and see if the studio you would like cannot be erected on another part of the ground at your disposal, farther away from the house and party-walls.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1918. Vol. XLIV.—FEBRUARY 5, 1897.

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EX CATHEDRÂ.

Sir Henry Trueman Wood, in the last number of the *Journal of the Society of Arts*, published a communication on the subject of "Photography in Colours," according to the process of a M. Chassagne, of Paris. We reproduce Sir Henry's article in another part of this week's Journal. The process, which leads Sir Henry to make the serious and unqualified statement that for all practical purposes . . . . photography in colour has actually been obtained, consists in taking the negative on a gelatine plate prepared by treatment with a special solution, and making therefrom, on a surface previously prepared with the same solution, a print or transparency which is washed over successively with three coloured solutions, blue, green, and red. Demonstrations made by M. Chassagne, in the presence of Sir H. T. Wood, Captain Abney, Professor J. M. Thomson, and Mr. Herbert Jackson, appear to have convinced those gentlemen of the remarkable nature of the process and its results.

* * *

It would seem, according to what Sir Henry Wood says, that we may shortly expect the results of further experiments and independent investigation of M. Chassagne's process. These results and any other information with regard to the process will be awaited with great interest. M. Chassagne appears to have kept the nature of the four solutions, and his method of preparing the negative and positive surfaces, secret, and, until that information is available, it is difficult, if not impossible, to discuss the rationale of his process, which, however, in so far as it seems to impart to a positive image the power of selective colour-absorption, would appear to be based upon a novel principle.

* * *

By the courtesy of Sir Henry Wood, we were enabled to examine some of M. Chassagne's results. The subjects were landscapes, portraits, and a copy of a picture. They appeared to be ordinary silver prints. The colours, though possibly truthful, were poor and weak, and at first sight the pictures struck us as resembling photographs that had been coloured from the back in a not too effective manner. On the other hand, a large transparency of a Japanese lady amid decorative surroundings was far more successful as regards the minute detail and fidelity of the various colours translated. M. Chassagne's results were undoubtedly produced, according to the evidence of four unimpeachable witnesses, in the manner claimed, and his process may be considered a somewhat novel one of colouring photographs; but the results we saw were decidedly inferior to Lumière's productions by the Lippmann method, while they are not comparable to Mr. Ives's photo-chromoscopic pictures; and we are also reluctant to admit that they present any appearance of taking us perceptibly nearer to the solution of the problem of photography in natural colours. The process, however, is only in its early stages, and is to be submitted to further experiment, so that opportunity may arise for forming a more favourable opinion of it.

* * *

We hope that Mr. Bennetto, of Newquay, and the syndicate alleged to have purchased his very mysterious colour process, are not perturbed at the announcement of M. Chassagne's discovery. Whatever opinions may ultimately be formed of the French inventor's process, it is in his favour that he has not hesitated to submit his results to competent authorities, and demonstrate his process before them. The daily and other

newspapers, we observe, are publishing sensational and misleading articles on the newest phases of colour photography, the result being that people are induced to form erroneous ideas on the subject. We may mention, that during the last few months we have had several requests for "a process of photography in natural colours such as a photographer could take up and work." Of course, no such process is yet practically available, although, to read the daily newspapers, one might be induced to think otherwise.

* * *

What is to be known as the Paper-makers', Printers', Stationers', Bookbinders', Fine Art Publishers', Photographers', and Allied Trades' Exhibition and Market, "held in conjunction with the games, sports, &c., exhibition and market," is to take place at the Royal Agricultural Hall, Islington, from June 23 to June 30 next. An attempt has been made to enlist the help of the Royal Photographic Society in promoting the success of the photographic section, but we are informed that the Council of the Society have declined to have anything to do with the matter, which, we apprehend, is entirely a commercial speculation on the part of a number of gentlemen constantly engaged in exhibition-promoting. It is on the cards that a representative technical and trade photographic Exhibition will shortly be held in London, under the auspices of those qualified to assume its management; but, even if that should not prove to be the case, the Printers', Stationers', and Bookbinders' Exhibition can hardly expect to receive any considerable support from the photographic trade, which, we apprehend, would prefer that an Exhibition got up in its interests should not be controlled by outsiders, practically unfamiliar with the special requirements of the case.

* * *

Mention of Exhibitions reminds us that the South London Photographic Society, whose annual Exhibition is to be held in March, has already let the whole of the very considerable space allotted to trade exhibits. The Society at its annual displays has always made a special feature of encouraging the trade to exhibit apparatus, &c., and have invariably met with success in their efforts to attract a representative collection. The support given by the trade shows that these efforts are appreciated by those on whose behalf they are made. The South London Executive is an energetic body, whose example should provoke imitation by other societies holding Exhibitions.

* * *

The Suffolk-street Galleries, Pall Mall East, are at present filled with the Forty-second Exhibition of the Society of Lady Artists, some hundreds of paintings and specimens of handicrafts filling the rooms. By dint of assiduous exploration we discovered in a corner of one of the smaller rooms about half a dozen photographs, for the inspection of which, we presume, the Society had invited us to attend. As these photographs come under the heading of what Mr. H. P. Robinson, in his article elsewhere in this week's Journal, lucidly describes as the "usual thing," we are absolved from the task of criticising them. We think that the Society of Lady Artists might endeavour to get together a larger and better collection of photographic work by ladies, or drop the feature altogether. The names of Messrs. Lyonel Clark and George Davison figure on the Selection Committee, but we take it that their office is a sinecure.

Mr. Robinson commences in the February number of our charming contemporary, *The Practical Photographer*, a series of autobiographical sketches. We give one quotation from the first paper, which has several capital illustrations of Ludlow, the author's birthplace: "It is usually the struggles of a life that provide the lessons. The early part of mine was full of struggles, but also full of what is called the luck that helps effort, and, with all its crosses, full of happiness. Taking a calm look backwards, I think that the episodes I would prefer *not* to have missed are the struggles. The fighting spirit, taken in its best sense, is the most useful a man can have." Mr. Robinson declares that one of the two supreme photographic pleasures of his life was leading the Convention to Ludlow in 1895. Judging by his first instalment, Mr. Robinson's autobiographical sketches will make interesting, instructive, and helpful reading to photographers. They are to be continued every alternate month.

A SIMPLE TEST FOR MOUNTS.

Not an inconsiderable proportion of the queries that reach us for reply in the Answers to Correspondents column have reference to the deterioration of silver prints—their fading, becoming yellow, stained, or spotty. In nine cases out of ten the writers suspect the mounts as being the cause. Indeed the mounts, according to some, appear to be considered as almost the sole cause of deterioration. That some mounts have had, and do have, a deleterious effect on prints mounted on them cannot be gainsaid, but, more often than not, perfunctory manipulation has been, and is, the real source of the evil.

Some time ago—1888—Mr. E. W. Foxlee read a paper before the Photographic Club on a very simple method by which any one, though quite unacquainted with chemistry, could test his mounts, and at the same time he showed the results of a number of experiments made with different samples of mounting boards. These same results he recently showed again at the Club, after the eight to nine years' keeping, and they are very interesting. We have since had the opportunity of carefully examining those prints, and some others treated at the same time, and have them before us as we write. Curiously enough, they do not, so far as one can judge, seem to have undergone any material change in the interval, as they correspond precisely with the results detailed in the paper which was given in our issue for November 9, 1888.

As it may prove useful to many of our newer readers, who may be in doubt as to the suitability of the mounts they are using, we here briefly recapitulate Mr. Foxlee's method of testing. It may at once be pointed out that this system does not show what the injurious matter may be, but simply indicates its presence, or otherwise, and that, the author of the paper states, it is what the practical photographer is most interested to know. If a silver print is kept in a damp condition, at a tolerably warm temperature, it will in a comparatively short time show unmistakable signs of deterioration; but, if a further disturbing element be present, the deterioration will be hastened. The method in practice is this, and it will be seen that the question of a doubtful mountant does not come in.

The mount to be tested is slightly moistened with distilled water, and over a part of it, say half, is placed some impervious material, such as a piece of gutta-percha tissue or a piece of talc; in the example before us it is three thicknesses of

ordinary paraffined paper. A silver print, preferably lightly printed or from a feeble negative, is laid, face downward, over the whole, and backed up with a piece of good-quality white paper. The lot is then secured together at one end with two or three paper-fasteners to keep it in position when examined. On the back of the plain paper are now placed several thicknesses of slightly damp, not wet, blotting-paper. The whole is then put between two glass plates, to retain the moisture, under pressure, and stored in a warm place. The print is then examined from day to day.

Now, it is obvious to every one that a silver print, kept under these trying conditions, will quickly succumb, and it will be equally manifest that, if the portion which is in contact with the mount shows signs of fading, spots, or stains, before that part which is isolated from it by the paraffined paper, the mount must be the cause. In the examples before us some of them showed a marked change in the parts in contact with the mounts in a couple of days, while with others three weeks' contact showed no change whatever. With some of the coloured surfaced mounts a staining of the paper occurred within an hour or two, but weeks' contact did not cause a fading of the silver image itself, as can be seen by examining it by transmitted light, though the stain is so deep that it quite hides it by reflected light. In some of the coloured mounts the image is not only stained but faded as well.

Some of the examples show, unmistakably, the pernicious effect of bronze powder on the prints when used for the lettering on the mount. Curiously enough, some of the commonest and cheapest boards—some of which came to pieces in the tests—proved more inert than some of the most costly ones; indeed, some of these showed no injurious action after three weeks' treatment. In one or two instances, however, the test has shown that mouldy paste was used in their manufacture, and the cardboard soon developed a good crop of mildew.

One noteworthy point with these examples is that, although they were produced so long ago, and were subjected to such a trying ordeal at the time, they do not appear to have undergone any change since. The prints are light—light prints were those recommended in the paper by its author—but they must have been carefully produced in the first instance.

Mr. Foxlee attributes the non-change in the prints, it may be mentioned, to the fact that, after the tests, they and the mounts were thoroughly dried, and have been stored in a very dry place ever since.

We refer to this subject again, as we have just intimated, to direct the attention of our newer readers to the fact that they have in their hands a simple, yet efficacious, method by which they can satisfy themselves as to whether their mounts are safe to use or not.

Curious Lantern Experiment.—Mr. Croft, at a recent meeting of the Physical Society, among a variety of simple and beautiful experiments exhibited one which would form a very interesting addition to the lanternist's *répertoire*. A double lantern is so arranged that the light discs partly overlap one another. A sheet of green glass is placed before one objective, and the light from the other decreased till the illumination is about even. The overlap is then apparently white, while the uncovered disc appears red. Professor Sylvanus Thompson was surprised to learn that the experiment could be successful when only patent plate glass was used.

A New Form of Gold.—Many years ago a curious and anomalous property of a mixture of hypo solution and chloride of gold was pointed out in these columns by a well-known contributor, and recently Mr. Carey Lea has described another singular gold experiment in the current number of the *American Journal of Science*. About half an ounce of a ten per cent. solution of hypo is placed in a small beaker, and about fifteen minims of a ten per cent. solution of chloride of gold added, and, finally, one drop of sulphuric acid. As soon as the solution begins to darken, an ounce of water is added. The solution then assumes a deep green colour, due to very finely divided blue gold suspended in the yellow solution.

A Novel Mode of Thawing Frozen Water-pipes.—Our contemporary, the *English Mechanic*, has recently given a novel method of overcoming a seasonable difficulty which, at this time of the year, is often of especial trouble to photographers, the thawing of frozen water service pipes, which, as every one knows, is apt to seriously delay all printing and dark-room work. It goes without saying that heat is the only remedy, the difficulty is how to apply it with the best chance of success. The new plan is simply to place unslacked lime around the pipe, keeping it in its place by straw wrappings, and then to pour on water. If the lime is properly applied and kept in its place, the heat given off by the slacking of the lime will be so great as to effectually prevent the frost effects. The same method, in a slightly different form, is recommended for preventing the freezing. The lime is similarly applied and kept *in situ* with straw, but, instead of adding water, the moisture of the atmosphere is allowed to play, and its gradual absorption by the lime leads to a constant rise of temperature sufficient, till the lime is slacked, to maintain a fluid condition of the contained water.

Sensitive Litmus Paper.—Most chemists and photographers have their own special mode of producing litmus paper, and we have from time to time published methods of manufacture as given by various authorities. A foreign pharmaceutical and chemical journal gives, perhaps, the simplest method yet published for a really sensitive paper, a sensitiveness put down at 1 in 150,000—say a drop of acid in two gallons of water. The strongly alkaline cubes of commerce are covered with twelve or fifteen times their weight of water, and allowed to stand for a day. The deep-blue mixture is then treated with sulphuric acid till it becomes a bright red, and heated for fifteen minutes in a steam bath. To the liquid, which generally turns blue again, dilute sulphuric acid is added until filter paper immersed in it becomes of a reddish-violet colour. When the liquid is cold, it is strained through cloth, and so adjusted by the addition of drops of sulphuric acid or traces of the litmus in powder, that pieces of paper immersed and quickly dried take the required tint, red or blue. It may be pointed out that the best litmus paper sold in this country is tinted, not by immersion, but by the coating one side only of a strong, but thin and hard, paper of sufficient purity.

Alcohol from Acetylene Gas.—It would scarcely be supposed that pure alcohol could be produced from such an unsavoury smelling substance as acetylene gas, but in *Le Monde Moderne* is given a full account of the method of performing the feat. Acetylene contains carbon and hydrogen. A little more hydrogen and a sufficient quantity of oxygen being added, we get alcohol. In a flask calcium carbide and scraps of zinc are placed; in a second flask, communicating with the first by an indiarubber tube connected with the lower part of flask number one, is placed dilute sulphuric acid. By raising or lowering it the liquid can be caused to enter at any rate. We, naturally, then obtain acetylene and hydrogen. The latter, being in a nascent form, has a tendency to combine with the former to the production of ethylene, and we now want oxygen. The evolved ethylene passes into a glass worm, through which slowly passes sulphuric acid, heated to 80° C. Oxygen is taken up, and ethyl sulphuric acid produced, which drops into a third flask. Upon boiling this last product, absolutely pure alcohol is produced, and collected by condensing the vapour produced

by the boiling. Whether all this could be done on a successful commercial scale or not is a question that remains to be solved. The industrial cost of alcohol produced in this way is estimated by *Le Monde Moderne* at twenty centimes per litre, a little under sixpence per pint.

Photography in Fiction.—We have from time to time alluded to the extraordinary and, in many cases, impossible uses made of photography by writers of fiction, and the latest that has come under notice is scarcely behind previous ones in the boldness and originality of its principal idea. If its probability does not strongly appeal to the practical photographer, it is, at least, *ben trovato*. The story is found in the first number of the new series of *Cassell's Magazine*, and the scene is laid in art circles in Paris "At the Third Pair" describes how one Labarre, a painter of historical battle pieces, is found dead in his studio with a sword thrust through the heart. The narrator of the story, his next neighbour, also an artist, relates how, shortly before retiring to rest, he saw Labarre enter his studio, and almost immediately afterwards a third artist, one Guerimond, passed the place in a somewhat hurried and excited manner. At just ten o'clock—note the time—having retired to rest, his attention is attracted by a shout somewhere in the neighbourhood, Labarre's gate having previously been opened by some one entering, and again as the visitor departs after a brief stay.

Such are the incidents of the night before or of the murder. In the morning Labarre is found by his caretaker lying dead in front of a large battle piece he is finishing for the Salon, and the suspicions of the narrator of the story at once, for reasons given in the story, but which space does not permit us to enter into here, fall upon Guerimond, between whom and Labarre some ill feeling existed. Suffice it that Guerimond is arrested on the charge, and things look very black against him. Meanwhile, the deceased artist's effects have been scattered by the auctioneer, and amongst the mementoes of his dead neighbour, bought by the narrator, is a photographic camera, fitted with an instantaneous shutter, that Labarre always kept ready set for securing difficult poses. Returning to his *appartement*, after the first day's trial, in a state of great anxiety on behalf of his friend, the narrator's eye falls upon the camera, which, fixed on its tripod, stands just as it has been brought in from next door some time back, and with shutter in the dark slide still drawn and flapping in the draught of the window. An idea strikes him, and he rushes off with the dark slide, having presumably had the sense and knowledge to close the shutter, to a friend—one Dafour—who dabbles in amateur photography. He, however, does not look very hopefully on getting any result.

But, after an anxious period in the "dark fluid" something begins to appear, and, after patient development, a picture is obtained showing Labarre's painting in every detail and the artist himself falling with a sword through his chest. But, unfortunately, the figure of his assailant is so blurred as to be utterly unrecognisable. It suffices, however, to prove Guerimond is not the assassin, since the blurred figure has a moustache, while the former's is bare. This marvellous negative is shown in court, and, together with the appearance of the real assassin—Guerimond's brother—who calmly declares the affair to have been one "of honour," the prisoner gets off. But what must we think of the wonderful camera and instantaneous shutter that are so set as to "go off" at the critical moment, by the fall of Labarre's body, and take a snap-shot of the scene at ten o'clock at night? Surely the dry plates of Parisian fiction are quicker than ours!

DIGRESSIONS.

No. XIV.—The Pictorial, the Usual, and the Critic.

I have been asked to define the difference between a pictorial photograph and what is now generally known as "the usual thing." The request I quite recognise as an attempt to draw me. To this I do not object, although I am aware that those who do not, without definition, feel the charm of art can never be taught to feel it fully, and those who feel it fully, usually resent being taught what it is. Even if I fail to give a satisfactory reply, at least something will be done; nothing can be more educational than the endeavour to crack hard nuts. One part of the problem need not give much trouble. "The usual thing" is a good photograph representing facts only. I say good advisedly, because everybody who can afford the materials, and is endowed with average common sense, can produce it good. Nothing more is now required. "The usual thing" used to take much skill to produce, but little is required now. Sufficient desire to make a good photograph, and some energy and patience, that is all.

Out of every hundred photographs, ninety are the usual thing, nine come to grief in some way or other, and the last is a picture. I do not, of course, count the failures of those who take medals for not having begun to practise till a year ago, or for being only fourteen years of age. The usual thing may suggest art possibilities, but never shows them carried out. A pictorial photograph exhibits something more than mechanical perfection. It must show that the photographer (whom we used to think of only for his mechanical dexterity), by his selection (a word of wide application), treatment throughout, from using the camera, through revising the negative, the printing, even down to the mounting and framing, yea, even unto the dodges to which I shall refer presently, sees and shows something beyond the material facts open to the producer of the usual thing.

There are varieties in the results we call pictures.

A picture may be a poem in paint or equivalent material, or it may simply represent the impression a prosaic scene in nature has on the mind of an artist, or combine something of both. The value of a poem, apart from the thought, depends largely upon the way in which the ideas are set forth. Bad grammar, or doggerel, would not be tolerated in an epic, or limping lines in a lyric. There is great similarity in the fundamentals of all means of art, and bad technique is no recommendation to a painting or photograph. It is true that it is not easy to say what is good technique. In photography much is called bad technique by mechanical photographers that is the result of careful consideration and infinite pains. A stroke of the brush by a master may be better technique than the most elaborate and minute niggling of a Durer or a Gerard Dow.

The second example of what may be a picture—the impression that says nothing further—seems to me to be nothing but a school exercise in certain methods of representing or interpreting nature, very useful in academic practice of methods, very interesting, and sometimes when the tune is harmoniously produced, very enjoyable; but, unless it goes further, it is never anything but a school exercise. Yet the impression that says nothing further than the effect a scene has on a sympathetic brain is infinitely more interesting and valuable than the machine-made "usual thing," however complete. I hope I have made clear what I should suppose that everybody by this time perfectly knows.

The misfortune to the photography of the present time is that the camera is the first tool used; it ought to be the last, after years of preparation, as I had occasion to note in a letter the other day.

A thorough study of impressions, carefully noted down, would be more valuable to the student than any amount of crude camera work, however perfect in mechanical technique.

The striving to make every photographer do nothing in the production of his picture but what everybody else does; the determination that a skilful artist shall take no more advantage of his knowledge in producing a picture than an analytical chemist would, has received a swinging blow and great discouragement the last five or six years, and is dying a natural death, but the unsuccessful still object that a pictorial photograph is not taken in a straightforward and honest manner, but must be the result of some trickery. The best and most typical instance of this effect of jealousy, envy, and excuse at any price for its own failures on the photographic mind, occurred over the pictures of Adam Solomon, too long ago for the present generation to remember. These portraits were undoubtedly much better than any ever seen in this country up to that time, except perhaps D. O. Hill's, which would certainly have been scouted

d photographs at that time. They displayed admirable technical ›graphy and good taste, but the secret of their beauty was great ledge of art in their producer. This important fact was stently ignored by the producers of the usual thing of the time. heir perfections were put down to dodges and trickery; it was size; retouching—then just introduced; paper that toned a cular colour; and more especially a particularly kind of wax which the surface was polished. Everybody so hunted for es, and so indulged in that modern scientific vice, the excessive ht and pride in "finding him out," that they lost the true scent. know more now, but still a good many of us are not hunting the quarry—or trying to.

nother cause of some of the pictures "no fellow can understand," yet are beautiful, is said to be the use of secret processes. I believe there is anything known that has not been published; if every photographer does not know everything, it is because he not read. But is there any encouragement to a photographer, n he has produced a new and successful effect, to give himself y by describing the minutiæ of its production? Only the other in a discussion on Mr. Storey's capital paper on Colour, a ker said "he thought judges and critics of photographic exhibi- s would be greatly assisted if photographers would make a few s of the time of exposure, setting forth the conditions obtaining e moment, and append them to their pictures. One would then v whether certain beautiful effects were 'flukes,' and whether were photographed at the particular time of day indicated in itle. He fancied that pictures called sunsets were often taken nrise; and, although some people said there was no difference ween the one and the other, he thought there was a good deal of rence." I apprehend it is for the critic himself to say, from t he sees in the picture and knows of nature, whether the sun setting or rising. One thing I don't mind telling him, how- . He thinks sunsets are often taken at sunrise. His know- e of human nature ought to tell him that it is probably the r way about, and that sun*rises* usually occur when the photo- her is in bed.

nent this subject of showing your hand and teaching your critic ay quote my own case. I began my photographic life with the rmination to have no secrets of production. The result of y years' experience is that, in every case where I have disclosed particular method of obtaining particular effects—received at with favour—the knowledge has been taken advantage of ad- ely.

pictorial idea is never allowed to be of any value, and if you eal a single artistic thought, or a new method of expressing tic thought, on the concealment of which much of the success of picture may depend, you are called illiberal, and accused of ery and faking. On the other hand, a mechanical idea, how- small, is patented almost before it is hatched, and nobody cts. About 30,000, I believe, were applied for last year.

is mention of critics having drifted me on to the subject, I may ell go a little further with it.

nder the conditions of a perfect state of things, the teaching c should know more than the author of the thing criticised. A icism should be the voice of authority. The objects of the ent-day critics are much simpler than they used to be. When icism was at its best, the critic would seriously reason and argue t his subject, so as to get out all its points, or its salient ts, one of his objects being to leave the reader with more vledge of the matter than he had before, and of the author or t's treatment of it, leaving him something to think over. He ld praise the strong points, and show why they were strong; I afraid he was never very tender to weaknesses, but he justified ensure. He treated them jocularly, severely, or with contempt, rding to their kind. The total results of his efforts would be to uct and amuse, and his article would be something to remember. should now, perhaps, consider him rather strong in some of his rks; there was the occasional knock-down blow, at that time n as all in the day's work, but in these more shockingly civilised s is replied to by threat of action for libel. Let us take a me of Hazlitt's *Criticisms*, and take the first passage we come to as a sample of the old work; I have no doubt it will be found full of "meat." Here it is, and it seems appropriate:—

"In general, it must happen in the first stages of the arts that, as none but those who had a natural genius for them would attempt to practise them, so none but those who had a natural taste for them would pretend to judge of or criticise them. This must be an incalculable advantage to the man of true genius; for it is no other than the privilege of being tried by his peers." Hazlitt goes on to point out how the public taste is vitiated as it widens; how criticism gets weaker the more it is watered; how the greater number of judges the less capable must they be of judging, for the addition to the number of good ones will always be small, while the multitude of bad ones is endless, "and thus the decay of art may be said to be the necessary consequence of its progress." He must have had the multitude of paragraphists instead of reviewers we now have in his prophetic eye.

Photography especially suffers. I do not speak of the photographic press (though some of my friends would be none the worse for a more profound study of the possibilities of the art they are supposed to protect), but of that outside press which usually supplies us with paragraphs about photography in colours, and the members of which, when the season comes round, are detailed off by their editors to "do that little job," the Salon, or the Pall Mall. "Just a few lines, not too gushing, nor too severe." The quality of the work does not matter; the "few inches" are filled up to order. In consequence of competition everything is hurried, there is no time for original thought even if there was capacity, and most of the accounts of exhibitions are as much alike as the country reporter's notice of a banquet when he says, "the excellent and seasonable repast of choice viands was served up in mine host's well-known first-class style, and done ample justice to."

H. P. Robinson.

PHOTOGRAPHY IN COLOURS.

[Journal of the Society of Arts.]

I am anxious to make, through the medium of the Society of Arts *Journal*, at all events a preliminary announcement of a very remarkable process for producing photographs in colours which was brought to my notice the other day. To say that it enables photographs to be produced in natural colours would not, perhaps, be precisely true, since colouring media are employed; but the result of the process is a photograph in the colours of nature—a faithful reproduction in colour of the object photographed—and so, for all practical purposes, it may be said that the long-sought object of photographic research, photography in colour, has actually been obtained.

The inventor is Mons. Villedieu Chassagne, of Paris, who has developed a process originally suggested by Dr. Adrian Dansac. The following is his method: (It must be premised that he keeps secret, at all events for the present, the nature of the four solutions he employs.) A negative is taken on a gelatine plate prepared by treatment with one of his solutions. This is developed and fixed in the ordinary manner. It shows no trace of colour. From it a print is taken on glass or paper, the plate or paper being specially prepared by treatment with the same solution. The transparency or the paper print in no way differs to all appearance from an ordinary positive, and shows no trace of colour by transmitted or by reflected light. It is then washed over successively with three coloured solutions, blue, green, and red, and it takes up the appropriate colours in the appropriate parts, these three colours giving, by their various combinations, all varieties of hue. How it is that this power of selective absorption is given to the components of the photographic image (principally, of course, metallic silver) is, it appears to me, the interesting question connected with the process. The action is certainly previously unknown, and it will as certainly repay scientific investigation.

As I declined to be convinced by mere inspection of the finished results, M. Chassagne was good enough to demonstrate the whole process for my benefit, and by the kindness of Professor Thomson, of King's College, the demonstration was allowed to take place in the laboratory of King's College on two mornings last week. Professor

Thomson and Mr. Herbert Jackson, of King's College, were present on both occasions, and Captain Abney on the second. I must not speak for those gentlemen, but I believe they were as much impressed as I was myself by the remarkable nature of the process and its results.

That such results should be obtained by such a process seemed *à priori* in the highest degree improbable, but obtained they certainly were.

The photographs taken by ourselves were poor, the light (on the morning of Wednesday, 20th) being extremely bad. Nevertheless, the positives (made by one of ourselves on the following day) showed with perfect distinctness, when treated as above described, the colours of a bunch of flowers I had bought at Covent Garden, on my way to King's College, and of various other test objects.

Our own experiments were confined to gelatine films, but M. Chassagne treated with complete success some paper positives he had brought from Paris. These looked like ordinary silver prints toned with gold, but I omitted to ask about the toning.

Further experiments and independent investigation (for which M. Chassagne has kindly promised me the materials) will, no doubt, throw further light on the nature of the process, but I cannot believe that any investigation will throw doubt on its genuine character, for it was carried out under test conditions last week, the sole reservation being the nature of the materials employed.

I hope that a fuller account of the method may shortly be presented to the Society in the form of a paper, but in the meantime it appeared to me that members of the Society would be interested by having placed before them the first information about so remarkable and promising an invention. H. Trueman Wood.

FOREIGN NEWS AND NOTES.

Anti-halation.—At a recent meeting of the Grand Section of the Association Belge de Photographie, M. Goderus stated that, by using a diaphragm of about *f*-200, the light is so feeble that it cannot penetrate the film, and therefore halation is not caused.

Blue Prints on Linen.—Tranchaut, in his little work, *La Linotypie*, which deals with the making of prints on material, and not with the linotype machines, gives the following method of sensitising linen for blue printing. The well-washed linen should be first immersed in a one per cent. solution of hard gelatine, and dried, and then sensitised with one of the following mixtures:—

A.

Ammonio-citrate of iron	27 parts.
Water	100 „

B.

Ferridcyanide of potassium	23 parts.
Water	100 „

Add A to B, and filter, and keep in the dark. Or the following may be used:—

A.

Citric or tartaric acid	26 parts.
Water	100 „

B.

Ferric chloride	20 parts.
Water	100 „

C.

Ferridcyanide of potassium	22 parts.
Water	100 „

D.

Ammonia	about 40 parts.

Add A to B, and then D, gradually shaking between each addition, add, finally, add C in the same way, and then filter the mixture. The linen can be sensitised by brushing the solution on with a water-colour brush. The latter mixture gives a more sensitive preparation than the former.

Fixing Prints With Salt.—M. de Saint Florent, recalling Liesegang's experiments on the fixation of prints with an alkaline chloride, such as magnesium, details some experiments he has using magnesium and sodium chloride, and he finds that prin not eaten out, and that the half-tones do not suffer. He pr the immersion of prints for four or five hours in a bath compo

Saturated solution of salt	100 parts.
„ „ „ hypo	0·5 „
Water	100 „

Prints may be left in this for twelve or twenty-four hours wi harm. This bath must be made fresh every day.

Three-colour Projection.—According to M. Margue the *Moniteur de la Photographie*, the positives made in the way with bichromated gelatine can be coloured with the foll solutions. For the red sensation:—

Carmine	5 parts.
Ammonia	15 „
Water	100 „

For the green sensation, a saturated solution of picric acid; f blue-violet sensation, a ten per cent. solution of methyl violet.

Metol Developer without Alkali.—Kastner state if metol is used without any alkali, all plates will give abso clear glass, and that plates which have received various exp may be developed in from ten to twenty-five minutes, wit details, with perfect immunity from fog. The developer m repeatedly used, and gives prints on bromide paper with blacks to platinotype.

Thiosinamine Toning.—According to Liardin (*graphische Mittheilungen*) the following mixture may be used combined toning and fixing bath with good results for gel chloride paper:—

Water	100 parts.
Thiosinamine	100 „
Solution of chloride of gold (one per cent)	100 „

The prints must remain in this bath about eight minutes. I following chlorides are used, the various tones are obtained. Pota chloride gives brown, salt yellowish brown; cadmium chloride first orange, then grey green; aluminium chloride gives g brown, yellowish brown, and greenish grey tones; nickel ch gives yellowish sepia; cupric chloride in fresh solution, yell green; when old, grey green; platinum chloride, grey brown; pota chloro-platinite, brown; gold and potassium chloro-platinite blackish violet; and aluminium and platinic chloride brownish

THE COLOUR OF EMULSION FILMS AND RIPENING AMMONIA IN GELATINE EMULSION.

II.

In 1876 or 1877, Mr. J. Johnston, of Glasgow, published in these p modified collodion emulsion process, for which great sensitivene claimed, the novelty in the process consisting in the employm ammonio-nitrate of silver in the crystalline form in place of the or nitrate. It fell to my lot to have to investigate the metho which purpose I was supplied by Mr. Johnston with samples own material as well as finished emulsion. Although in my own with these materials I was unable to produce as satisfactory resu those claimed by the inventor of the process, there is no disputin fact that the finished product supplied by Mr. Johnston fully bor his claims both as regards sensitiveness and quality, and this em may, I think, be taken as proving that "ripening" really consists chemical rather than a physical change.

I have already mentioned the action of ammonia upon the pyrox the result of which is to quickly convert a collodion emulsion t granular blue or green state, and eventually cause its precipit Now, Johnston's emulsion, although smelling most pungently of monia, reached me, several days after it left him, in perfect cond giving a rich creamy film of perfect fineness, and exhibiting rather than the usual ruby colour of a collodion emulsion in first-rate cond and in this state it remained for some days, after which the bro gradually subsided, and the emulsion became useless.

The portion of Johnston's process by which he overcame, at partially, the disintegrating effect of the ammonia, consisted in a certain organic substances to the collodion, amongst which were albu

olive oil. But it was in this part of the process I failed to follow successfully, for my emulsions were generally blue and granular, if I lect rightly, almost from the start, so that I have nothing much to about them in this connexion.

ıt, returning to Johnston's own emulsion, some considerable time I had dropped the matter I found the bottle containing it on my -room shelf, the bromide settled into a compact layer at the bottom, the supernatant liquid perfectly clear. This was poured off quite ely, the solidity of the layer of bromide permitting this to be easily e, and some fresh plain collodion poured in to replace it. Then a stir a glass rod and vigorous shaking for a minute or two converted it one of the most perfect emulsions I ever used. Its sensitiveness considerably higher than that obtained by ordinary methods, it was tifully fine in grain, and a very rich ruby colour, and, after reemulsi- ion, exhibited no further tendency to separate—no more, at any rate, n is usually manifested by collodion emulsion.

he conclusions to be arrived at from the behaviour of this emulsion —(1) That sensitiveness does not depend upon either coarseness or eness; (2) That it is rather dependent upon some organic com- ation, which the collodion alone is unable to fulfil; and (3) That rseness and change of colour do not necessarily follow the use of monia. I could give numerous other instances from my own practice, wing both with gelatine and collodion that "ripening" does not sist of a purely physical change, and that the highest sensitiveness y be obtained without either coarseness or loss of red colour.

Before concluding, it strikes me to remark that a short time ago a stion was raised as to the first use of ammonia in connexion with atine emulsion. To Johnston belongs the credit of introducing it for lsion purposes, and its first published application to gelatine will be nd in a leading article on Johnston's process some time in 1876 or 7; I have not the volumes by me for reference. Later on, in 1879, Van Monckhoven took it up, but I cannot tell the precise date. I ve a letter of his, dated October 19, in which it is mentioned, and o a hitherto unpublished method of obtaining sensitiveness. Professor bbing could probably fix the date when Monckhoven was working with monia, as he was in London in the summer of 1879, and took with n direct to Gand some samples of emulsion prepared in my dark room, out which Dr. Monckhoven and I subsequently corresponded; but I ve only the one letter of October 19 by me now. It was somewhere out this date that Monckhoven published the ammonia process in the *lletin Belge.*

W. B. Bolton.

THE STATUS OF PHOTOGRAPHY AND PHOTOGRAPHERS.*

IENCE, the philosophy of the senses, and the fine arts are to be vanced when photographic materials are more sensitive and processes re certain. These have been achieved, and the claims of photography an auxiliary of physical science, and even its title to be something re than the handmaid of science, have never been less open to question. e philosophy of the senses has yet to be extended by photography, ough the rumours of "thought photography" seem on the borders of e subject. The X rays may also help in this direction.

It is on the third point that progress has been greatest. A vigorous pulse has been given to the fine arts, but artists, unlike the scientists th science, will not allow the claim. The *Edinburgh* admits "that e art of painting will derive incalculable advantages from photography," d this, without doubt, even amongst painters themselves, was the evalent faith of the time. Not otherwise can we account for the first esident of the then London Photographic Society, Sir Charles Eastlake, ing also President of the Royal Academy. It is only necessary, to ppose a Leighton or a Millais occupying a similar position, to be aware w radical a change has come over the bearing of the painter towards e photographer. This cannot be on artistic grounds. For, although a audet would charge two-and-a-half guineas for a quarter-plate, and ur guineas for a half-plate Daguerreotype, it cannot be urged that the istic quality of these productions was on a level with the best of more ent work. Certain it is, however, that to-day the painter considers e photographer as outside the sacred sphere of art, yet he has less ounds than previously for his unfavourable verdict, and we cannot sume that the master of the past had less artistic insight than the aster of the present.

The antipathy springs from a growing conviction that photography s destroyed the validity of painted pictures—in portraiture almost mpletely. As a delineator of the human countenance the camera is eferred to the brush, because of its greater truth and its impersonal aracter. A personal impression of a personality may be art, but it is t portraiture. The *Edinburgh Reviewer* also brings out this value of otography. He says: "In considering the relations of photography

* Concluded from page 72.

to the art of painting, we are disposed to give it still higher rank. Could we now see in photogenic light and shadow Demosthenes launching his thunder against Macedon, or Brutus at Pompey's statue bending over the bleeding Cæsar, or Paul preaching at Athens, or Him whom we must not name, in Godlike attitude and celestial beauty, proclaiming goodwill to man, with what rapture would we gaze upon impersonations so exciting and divine!"

Regarded from another aspect, the validity of photography may be tested by weighing all the reputed paintings of Shakspeare against a single cabinet negative of undoubted authenticity. In spite of the artistic skill of the paintings, the photograph would outweigh them, for in that we should behold the man Shakspeare as he lived and appeared in the flesh. This advantage brings photography very close to painting. Never before the present day have photographers had an equal right to compare their productions with paintings, and the comparison in portraiture leaves the victory often with the photographer rather than the painter. In gracefulness of posture, excellence of lighting, the use of accessories, in all matters showing a sense of taste and artistic insight, the photographer is often in front of the painter; in not a few instances he surpasses the efforts of the best painters. This was done in the case of Tennyson. The painters failed entirely to reproduce the delicate and beautiful outlines of the poet's countenance, the only portrait which admittedly pleased those who associated with him being a fine photograph taken by photographers. They selected the side face of Tennyson, the better view, whilst the painters chose the full face, thinking that, by force of artistic genius, they could raise the worse above the better. Watts's portrait, in the National Gallery, is of this class, a mystical, dreamy face, with veiled eyes, inferior to the photograph as an index to the poet's nature, and being more characteristic of Watts than Tennyson.

Another noted man with whom the painters failed was John Stuart Mill. A portrait of Mill, by Watts, hangs near Tennyson's in the National Gallery; on looking at the painting, a student of the works of this philosopher and humanitarian must suffer some disappointment over it, by comparing the man as here depicted and the man as revealed in his books. There is also a photograph of Mill, often seen in shop windows, a profile head; in this we observe a high, compact forehead, a well-shaped, longish nose, a firm, severe mouth, the clear, calm eye of the logician, altogether a superior, open countenance, and the most ardent admirer of Mill could not complain that the features were below the life and character of the man. In reality the photograph is the ideal, the painting the gross, material man.

Compare, again, the paintings and photographs of Carlyle, noting the fire and power of his eye in the photographs that no painter can give. The same force of the human eye is also most remarkable in the full-faced photographs of Bismarck or Gladstone, no painter being skilful enough to express this peculiarity.

In these instances the photographer triumphs because his means of rendering subtle shades are greater, the painter being unable to show upon his canvas those delicate gradations and lines which go to make up the character of a face. Photographs may not be "soul studies," to use the cant art term of the day, but they supply the deficiency of soul by giving fidelity of body. It would be hard to find a photograph that could be said to err from the reputation of a man, yet one has only to look upon the painting of Milton in the National Collection to find it almost impossible to believe that it represents the author of *Paradise Lost*, and, in addition, a man noted for his beauty amongst his contemporaries. In striving for the "soul" the painter is apt to forget the body.

Considering the undoubted superiority of photography over handiwork as a means of graphic representation, the finest painting, etching, engraving, or lithograph, seeming crude and bald beside a photograph, it is only fitting that the status of photography amongst the arts should be much higher than it has been, and as it must be, now that its possibilities have been amply demonstrated by numerous workers. Artists, however, have always shown themselves more ready to cling to old ideals than to admit the new and progressive. For photographers to remain content to accept the value artists choose to put upon their works is for ever to under-estimate the powers of the camera when matched against the brush.

Fortunately, events are working on the side of the photographer, and it seems likely that in the future photography will stand to art as the press now stands to the pulpit. The status of a body of men is determined quite as much by the number of minds they influence as by the quality of their work. Thus we see the press has taken the place of the pulpit by reason of the facility with which it reaches large masses of men. So, too, in the public mind, photography is taking the place of art, and in consequence its status must of necessity become higher.

With this responsibility before them, it is imperative upon those who in any way represent photographic art to keep before them a high ideal of what that art is, and of what it is capable. In portraiture, at least, photography is able to express in a high degree what men call art. If it is not so, then what denies art to the camera also denies art to every other method of pictorial representation.

Photographers having by reason of their art a naturally high status, it only remains for them to form an ideal within the possibilities of that art, to live up to it in their works, and so justify the inclusion of photographers in the professional class.

John A. Randall.

THE PHOTO-CHEMISTRY OF THE SILVER COMPOUNDS.

[Read before the New York Camera Club.]

Probably the most important of the photo-reducible metallic salts are the salts of silver, which now hold so important a place in most photographic processes, that a separate consideration of their properties and behaviour is not only in order, but of the utmost importance.

These salts are not only of the highest practical importance at the present time, but are also historically of interest as having been among the first compounds recorded in which a change of colour occurred when exposed to the light. Thus the darkening of the skin when touched with nitrate of silver was known to Albertus Magnus in the thirteenth century, who says in his celebrated work, *Compositum de Compositis*, "It colours the skin of man a black colour difficult to remove." Although Albertus Magnus was the first to note this photo-chemical action of the silver salts, he failed to recognise the cause of the action.

Fabricius also describes in his work, *De Rebus Metallicis*, published in 1556, the darkening of horn silver when removed from the mines.

The well-known alchemist, Glauber, says in his work, *Explicatio Miraculi Mundi*, published in 1658: "If from saltpetre and vitriol you distil a strong water, and dissolve a little silver in the same, and add common rain water to the mixture in order to dilute the aqua fortis, then this water will stain all kinds of hard wood so as to resemble ebony, and will also stain fabrics and feathers jet black."

Glauber overlooked, as well as Albertus Magnus, that the light in these reactions plays the principal *rôle*. Even Boyle, in his work entitled, *Experimentis et Considerationibus*, published in 1660, says "that the darkening of horn silver is brought about by the action of the air, and not by the action of light."

The first distinct statement of the darkening of a silver compound by the influence of light was made by a German physician, J. H. Schultze, in 1727, who observed that, when a solution of silver in nitric acid was poured on to chalk, the precipitate blackened on the side exposed to the light. This, he clearly proved, was caused by the light, and not by heat.

The salts of silver, whether organic or inorganic, are all more or less affected by the influence of light; this is especially so in the presence of oxidisable substances.

Thus a solution of nitrate of silver in water is not acted upon by light; but, if some oxidisable organic substance be added to it, the nitrate will be decomposed or reduced with the formation of metallic silver. Many examples of the photo-chemical action of light upon the salts of silver might be mentioned, but it will be better to limit our attention to those compounds which are of the greatest importance in photography, namely, the chloride, iodide, and bromide of silver, and which are known to chemists under the appellation of silver haloids.

It has been known since the middle of the eighteenth century that chloride of silver, when exposed to the light, first turns violet, and finally brownish violet. The earliest statement with respect to the precipitated chloride, as distinguished from the native chloride, or horn silver, was made by Professor Johann Baptist Beccarius, of Turin.

The cases of photo-chemical decomposition mentioned in a previous lecture on the "Chemistry of Photography," will have prepared you, I think, for the questions which we must now ask ourselves.

What chemical change does the discolouration of silver chloride indicate?

Is it a chemical change, or is it a purely physical one?

If chemical, is it a process of dissociation, of double decomposition, or of oxidation?

Some authorities hold that the change is a purely physical one, and that the violet-coloured silver chloride has the same composition as the unaltered compound.

This hypothesis may be dismissed at once, for it is a well-known fact that silver chloride loses chlorine when exposed to the light, which fact was known to Scheele as far back as 1777.

It has been shown by numerous analyses that the darkest chloride contains less chlorine than the white chloride. For this reason we might consider the change to be a chemical one, especially as there are means of estimating the amount of chlorine, or at least chlorine containing gas liberated.

We, furthermore, have indirect proof that chlorine is given off, owing to the fact that chlorine absorbents, such, for example, as nitrate of silver, stannous chloride, and organic matter, accelerate or hasten photo-decomposition, similar to the action of light upon a mixture of alcohol or ferric chloride. Such oxidising agents as mercuric chloride, stannic chloride, ferric salts, or chlorine itself, however, retard photo-decomposition, and, if present in sufficient quantity, arrest it altogether.

Taking it for a fact that the discolouration of silver chloride is due to a photo-chemical and not a photo-physical action, we will next be obliged to ask ourselves what is the chemical difference between the darkened and the white chloride? Until recently, it must be confessed that, beyond the fact that the violet chloride contains less chlorine than the white compound, we were very much in the dark; but, within a couple of years, this question has been pretty well cleared up, by the discovery of silver subchloride, whose existence, for some time past, had been surmised, but whose isolation in a chemically pure state had utterly failed.

It may, therefore, be of interest, if I point out what was known upon this subject prior to the discovery of pure silver subchloride.

It is usually stated in text-books that the change is due to the formation of a subchloride of silver, according to the following equation:—

$$4AgCl = 2Ag_2Cl + Cl_2.$$

Until recently the plausibility of this reaction could only be inferred from the similarity of silver with the metals of the copper group, as no chemist had succeeded in isolating the sub-salt Ag_2Cl in a sufficient state of purity for analysis. The idea that the sub-salt is the product of the photo-decomposition of silver chloride was first advanced by Fischer in 1814, and was reiterated in 1834 by Wetzlar, and since then has received general acceptance. It is easy to see why this theory has found its way into text-books, as though it expressed an accepted chemical truth. I have already shown that, when chloride of silver is exposed to light, it loses chlorine; hence it has been reasoned that either one of two things must happen, viz., the salt must be either reduced to the metallic state, or to a sub-salt. If the above is true, we should have a mixture of the unaltered chloride with metallic silver, or a mixture of unaltered chloride with the sub-chloride.

But it has been shown that the darkening of silver chloride can take place under nitric acid, and, as the latter does not dissolve any appreciable quantity of silver, it has been concluded that the silver chloride does not contain any free metal.

Hence it is safe to say that the darkening of silver chloride is due to the formation of silver subchloride.

What has modern chemistry to say with regard to the existence of the subchloride? As already stated, we have the analogy of silver to mercury and copper, both of which metals form subchlorides; but, though analogy at times is a useful guide, it is at times likely to lead us into difficulties, if trusted too implicitly. It is, therefore, safer to turn to the laboratory for information upon this point.

One strong argument in favour of the existence of the sub-salts of silver has been the suboxide, Ag_4O, which Wöhler claimed to have obtained in 1839, by reducing the citrate of silver in a current of hydrogen at 100° C.; but recent investigations by Muthmann (*Ber. d. d. Chem. Gesell.* 1887, p. 983); by Friedheim (*Ber.* 1887, p. 2554, and 1888, p. 307); and by Bailey & Fowler (*Jour. Chem. Soc. Trans.*, 1887, p. 416), appear to render the existence of Wöhler's suboxide extremely doubtful, and consequently the formation of the subchloride by the action of hydrochloric acid upon the suboxide, as problematical.

Such being the fate of the sub-oxide, it will be well to come back to the main question, and ask ourselves whether the darkened chloride has been submitted to such a rigorous chemical examination as to furnish distinct evidence of its existence. In answer to this, it must be stated that the evidence, until within the past two years, went no further than to show that the darkened chloride contained less chlorine than the unaltered chloride.

This result has in nearly all cases been arrived at by determining either the silver or the chlorine, and the calculating the loss of chlorine to represent the amount of subchloride formed. In this way different experimenters have given different estimates of the amount of chlorine formed. Thus Carey Lea, for example, states that, when silver chloride is exposed under water to the light for five days, one per cent. of the chloride is converted into sub-chloride, and Riche states that, after exposure for a year and a half, the reduced salt may be represented by the formula Ag_3Cl_2. But it will be granted that the consideration of such methods can never give satisfactory evidence of the existence of the subchloride, because its existence is first assumed, and then the loss of chlorine is attributed to its production.

So far, we are therefore not justified in the belief of the formation of the subchloride by the photo-reduction of the normal chloride. The product was not definite enough to be identified as a sub-salt, with the same sharpness that we can distinguish between other chlorides and subchlorides, as for example cupric and cuprous chlorides, or mercuric and mercurous chlorides. On treating the darkened chloride with such solvents as sodium hyposulphite, potassium cyanide or ammonia, a small amount of metallic silver is always left undissolved. Here again, however, we get no definite information as to the presence of the subchloride, for its existence was assumed, and the action of the before-named solvent may be represented by the following equations:—

$$Ag_2Cl + Na_2S_2O_3 = AgNaS_2O_3 + NaCl + Ag;$$
$$Ag_2Cl + 2KCN = KAg(CN)_2 + KCl + Ag;$$
$$2Ag_2Cl + 3NH_3 = (2AgCl + 3NH_3) + 2Ag.$$

As already stated, silver chloride darkens under nitric acid, and for this reason the foregoing equations appear rather problematical, for, if the subchloride were such an unstable compound as to be decomposed by these solvents, it is not likely that it could be formed in the presence of such a powerful oxidiser as nitric acid.

Enough has already been said in the foregoing for or against the existence of the photo-chloride, Ag_2Cl, to enable you to appreciate the uncertainty with which scientists had to contend while investigating this interesting subject; but all doubts as to the existence of this compound have now been laid at rest by the discovery and isolation in a chemically pure state of the much-doubted silver subchloride, Ag_2Cl.

The discovery of this compound was preceded by the production of a sub-fluoride of silver, which was described in the *Journal* of the *Chem. Soc. Abstr.*, 1890, p. 1055, and Güntz (*Compt. Rend.*, cxii. pp. 861–2), says: "When dry hydrogen chloride is passed over silver sub fluoride the latter becomes violet, and when the latter has reached its limit the product has the composition, Ag, 83·35 per cent. to 84·08 per cent. Cl–15·07 to 14·19 per cent., whereas the theory for Ag_2Cl calls for silver 85·88 per cent., and Cl–15·12 per cent. Carbon tetrachloride, silicontetrachloride, phosphorus chloride, &c., behave in a similar manner. Güntz has also prepared the sub-iodide by the action of hydrogen iodide, the sub-fluoride by the action of hydrogen fluoride, and the suboxide by the action of aqueous vapour at 160°C.

In a later article (*Compt. Rend.*, 861–2, cxii. p. 1212–13) Güntz says: Silver subchloride Ag_2Cl varies in colour from deep violet red to violet black, exposure to sunlight tending to convert it into the latter modification without loss of chlorine. When heated, it splits up into the normal argentic chloride AgCl and metallic silver. It is not attacked by dilute nitric acid; but, when warmed with the concentrated acid, it is converted into argentic chloride, mixed with a varying proportion of argentous chloride, or subchloride, forming the coloured products described by Carey Lea (*Journ. Chem. Soc. Abstr.*, 1888, p. 1). Potassium cyanide decomposes it according to the equation $Ag_2Cl + 2KCN = AgCN + KCl$; and the heat of formation was determined by means of this reaction, $Ag_2 + Cl = Ag_2Cl + 29·7$ Cal., whilst $Ag + Cl = AgCl + 29·2$ Cal., a difference similar to that observed in the case of the two fluorides.

A few words now in regard to the photo-decomposition of silver chloride. It is well known that under ordinary circumstances, *i.e.*, in the absence of chlorine-absorbing compounds, the reaction is a diminishing one, that is to say, that the compound does not go on losing chlorine until a reduction product of a distinct composition is left, but the quantity of decomposition product becomes smaller and smaller, until a limit is reached, and in this way the end product is always a mixture of the subchloride with unaltered normal chloride. As the quantity of argentous chloride formed under these conditions is so small, it can readily be imagined the difficulties the chemist had to contend with while attempting to isolate this substance from the large body of unchanged chloride. Hence it is not at all surprising that it took so many years to discover this interesting compound.

It may next be asked whether the darkened product of photodecomposition is really only composed of silver and chlorine, or whether it may not also contain oxygen or the elements of water as essential constituents? It is known that moisture accelerates photo-decomposition, but it is not known whether, in the absence of air and moisture, the change is altogether arrested. There is a certain amount of evidence that moisture and oxygen are necessary for the photo-decomposition of silver chloride, as was distinctly announced by Hunt (*Researches on Light*, second edition, 1854, p. 80).

The absorption of oxygen, or rather its absorption with the decomposing chloride, may be illustrated by the following simple experiment: If a little chloride of silver be placed in a bent tube, closed at one end, and, at the other end, be immersed in distilled water, and the whole be then exposed for several days to the action of the solar rays, care being taken to frequently shake the chloride of silver contained in the tube so as to expose fresh surfaces to the action of the light, it will be observed that, as the chloride darkens, the water will rise in the tube, and, if the latter is then treated with a few drops of silver nitrate, a precipitate of silver chloride will be obtained, thus appearing to prove the substitution of oxygen for chlorine under the influence of the solar radiation; but, it is also probable that some absorption of atmospheric air takes place.

If we criticise this experiment in the light of modern chemical knowledge, it must be admitted that the proof that the oxygen which disappears is absorbed by the darkening chloride is not perfectly conclusive, because it is possible that the nascent chlorine, in the presence of aqueous vapour and under the influence of light, may form some oxide of nitrogen which dissolves in the water. But, in spite of this objection, the experiment is a very interesting one, and worthy of further study. At all events, this shows that oxygen is necessary for the darkening of the silver chloride; but, whether the oxygen is derived from the air, or whether it is obtained from the aqueous vapour, is, up o the present time, doubtful.

What has been said concerning the photo-chemistry of silver chloride will simplify our work in dealing with the other haloids, as there is every reason to believe that such compounds as Ag_2Br, or Ag_2I, are also formed from the corresponding bromide and iodide of silver, under the influence of light.

Silver bromide darkens under the influence of light and loses bromine, the product finally becoming of a greyish-violet colour, but never as dark as the subchloride. Like the chloride, bromine absorbents, such as silver nitrate, stannous chloride or organic matter, accelerate the photodecomposition, while oxidisers, like ferric chloride, stannic chloride or mercuric chloride, retard the decomposition. In the case of the iodide, the discolouration is even less than with the bromide, and does not take place at all, unless some accelerator or iodine absorbent is present. The pure iodide, free from excess of silver nitrate, is apparently unchanged by light, but, in the presence of free silver nitrate, or other chlorine absorbent, it will assume a greenish-grey colour, and the darkened product is more readily decomposed by nitric acid than the subbromide.

Before leaving the photo-chemistry of the silver haloids, I would call your attention to the coloured forms of these salts, which were obtained only a few years ago by Carey Lea, and described by him under the names of photo-chloride, photo-bromide, and photo-iodide. These compounds are produced by such reactions as would tend to give rise to the formation of sub-salts in admixture with the normal haloids. In carrying out these experiments, a silver salt should be first reduced by a suitable reducing agent, and, after being freed from impurities, it is converted into the haloid by treatment with the necessary acid. The photo-chloride may be obtained of a red colour in the following manner:—

To a solution of silver nitrate add common salt, until the silver is all precipitated as chloride, and then add ammonia, until the chloride is all dissolved. To the ammoniacal solution add ferrous sulphate, and allow the black precipitate formed to subside. The precipitate is now washed two or three times by decantation, and acidified with dilute sulphuric acid, after which it is again washed by decantation. On boiling the latter with dilute nitric acid, and washing as before, and then boiling with dilute hydrochloric acid, we obtain the red-coloured photo-chloride, in accordance with Carey Lea's statement.

Lea calls these salts, of which the photo-chloride is an example, "photo-salts" because he considers them to be identical with the products formed by photo-decomposition. They contain less halogen than the normal haloids, and the reasons given in support of the view that the latent photographic image is formed of such photo-salts seemed to be perfectly valid, and have now become a certainty, since the discovery and isolation of the pure argentous chloride, argentous bromide, and argentous iodide.

J. H. Stebbins.

THE SUCCESSFUL INTENSIFICATION OF GELATINE NEGATIVES.

Some months ago an article appeared in these pages on Irregularities in Intensification, and an opinion was expressed therein that the after-strengthening of gelatine negatives was less resorted to now than formerly. This is probably so, but I must confess to a belief that, if intensification could be reduced to a reliable and expeditious process, many negatives, even in the present day, would receive just that slight additional density requisite for the production of a brilliant print which, rather than subject a valuable and almost perfect negative to the uncertainties of intensification they are now deprived of. That these uncertainties and irregularities may be reduced to a minimum, indeed entirely eliminated from the process, by the exercise of ordinary care and intelligence, I feel convinced, and it is to supplement the excellent advice given in the article referred to that some points in my own practice, contributing very materially to successful intensification are here emphasised. With regard to the permanence of an intensified negative, it may be stated at the outset that such negatives, in my hands, are equally permanent with negatives whose density was obtained in the process of development. Negatives intensified five or six years ago, and from which large numbers of prints have been obtained, are still as fresh as when first treated, and I would not hesitate, on the score of permanence, to subject the most valuable negative to the process of intensification.

The need for thorough fixation, alluded to by the writer of the article already mentioned, cannot be too frequently iterated, seeing how few photographers realise the supreme importance of this phase in the evolution of a negative. It is a matter for exclamation that photographers who exercise the most fastidious care in compounding and applying the developer yet perform the operations of fixing and intensification in a perfunctory and unintelligent manner. No negative that has remained in the fixing bath only until such time as the visible unaltered silver salts are just cleared from the film is either permanent or in a fit state for intensification, and those photographers who desire successfully to practise intensification should make fixation thorough by the use of a second fixing bath, discarding the first when it begins to show signs of saturation. In all cases it is my practice to immerse the negative, when washed, in the following acid bath, which minimises any possibility of hyposulphite remaining:—

Chrome alum	5 grammes.
Hydrochloric acid	20 c. c.
Water	500 c. c.

After a short washing the negative may be regarded as perfectly safe for intensification.

While much has been written in disparagement of mercurial intensification, it probably still remains the most popular of the many methods of intensification, and for permanence of result, when all operations have been carefully carried out, it has no superior. Previous to writing these lines commending mercurial intensification, some dozens of negatives thus intensified during the last six years, and which have spent a large proportion of that time in the printing frames exposed to spring and summer light, were critically reviewed for traces of deterioration, and in only one case was fading discernible, this instance being

a well-remembered one where intensification was hurriedly performed away from home with a limited supply of water, and, after bleaching, merely blackened with sodium carbonate. All the rest were in perfect condition. It may be laid down as an axiom that under-exposed negatives are useless for mercurial intensification, their salvation lies in uranium, an intensifier simply invaluable in its place. The negative most suitable for mercury is one fully, or indeed rather over-exposed, the quality of prints from such negatives when intensified cannot easily be surpassed, and the range of gradation is excellent.

Passing now to the details of my own method of procedure and formulæ I may state that they have been chosen after several years careful experiment and observation as giving the most uniform and reliable results. The preliminary bleaching was a simple matter and did not admit of much variation, a plain 1:20 solution of mercuric chloride in distilled water, without any foreign additions, is thoroughly efficient. It was the reducing agent that caused so much consideration, and after trying carefully, and for protracted periods, simply blackening agents such as ammonium hydrate, carbonates and sulphites, the conviction came that to be complete and reliable the bleaching should be followed by redevelopment, *i.e.*, if absolute permanence is desired. No length of immersion in hyposulphite will reduce a negative thus intensified, which fact has always appeared to me a testimony to its permanence. If the negative should be over-intensified, the only means of reducing it is by the application of a weak solution of Howard Farmer's reducer. The amount of bleaching I proportion to the degree of intensity required. It is usually stated that the bleaching should be thorough, and carried right through the film; this I have never found necessary except where the maximum density was required. Negatives which want a very slight increment of density receive only a momentary application of the bleaching solution, and seem equally permanent with those completely whitened. The washing after bleaching *must be thorough*, the success of the operation depends on it. Merely soaking for an hour or two in standing water is the way to court stains and disaster when redevelopment takes place. If the bleached negative cannot be washed in running water, at least the water should be frequently changed, and at each change the surface of the negative rubbed with a tuft of cotton-wool. After an hour's washing under running water the bleached negatives are placed in a bath of sodium chloride (1:10) for several minutes, and it was the introduction of this bath that made mercurial intensification in my hands a reliable process. A fair amount of washing after the salt bath leaves the negative in a fit state for redevelopment. This, after trying several agents, I effect with metol, as more certain in its action and less liable to produce iridescent stains. The formula used is as follows:—

A.

Metol	3	grammes.
Sodium sulphite	30	,,
Potassium bromide	½	,,
Water	300	c. c.

B.

Sodium carbonate	30	grammes.
Water	300	c. c.

To make up the developer three parts of A are taken to one of B, and applied until the bleached image is thoroughly reduced, when a fine black will result, very different in appearance from the brown image left after blackening with carbonate of sodium. If the density should be considered excessive, it may be reduced, as stated above, by a weak solution of ferridcyanide and hypo; but with practice a discrimination in bleaching will be attained that renders unnecessary any such operation. Very slight washing suffices to remove the developer, but it is desirable to pass the negatives through a weak hydrochloric acid bath, as the carbonate of soda often precipitates the lime suspended in the water, and causes a white powdery film to appear on the negative when dry.

This is the outline of a process that has come to be regarded by me in the light of an old and tried friend. Very few photographers can say they have no negatives that would be the better for intensification, and, although the method of procedure here described may seem to entail tedious and complicated operations, when once intensification is carefully mastered, and no conscientious photographer can afford to ignore it, the operation is infinitely more simple and straightforward than development. In businesses where many hundreds of negatives are made annually, and under conditions constantly varying, there will be a large percentage of negatives to be either reduced or intensified to a standard printing density, and reliable methods become a necessity. A reliable method of reduction has long been with us, and that intensification has hitherto been looked at somewhat askance is due more to inability on the photographer's part than to any lack of formulæ.

George T. Harris.

ON THE REMOVAL OF STAINS FROM GELATINO-CHLORIDE AND BROMIDE PRINTS.

II.

In a previous article reference was made to a simple method whereby a weak solution of ferricyanide of potassium might be utilised for the purpose of removing stains and slug markings from vignetted prints on gelatino-chloride of silver paper.

It is not only, however, in the removal of these eyesores or flaws from such portions of a print that this highly useful reducer is of so much benefit, for its application may be utilised in a far wider range, and much improvement effected on prints in which the high lights are devoid of sparkle, provided the same be applied with a reasonable amount of caution to such portions containing no detail that would be liable to suffer from its application.

The improvement to high lights is no doubt equally well effected by working up the negative in such parts as it is desired to print lighter in the finished copy, and is the method generally adopted by photographers having this object in view where a large number of prints have to be pulled from a simple negative.

Instances, however, will occur where prints exist in which the neglect to retouch or model the negative has resulted in the production of degraded high lights, and, very possibly, through over-printing, also the same thing may happen where negatives of a thin type are being dealt with.

Very many examples of such might be stated where the finished prints can be taken in hand and greatly improved by simply touching the extreme points of light with a very finely pointed brush made damp with a weak solution of the ferricyanide.

To any one having an experience of the benefit that accrues to this mode of treatment the following experiment will prove instructive Let any suitable photograph be selected in which the general result is judged flat by reason of over-printing or want of vigour in the high lights.

As I turn over my album in search for a descriptive instance, my eye lights on a portrait print in which the white-lace drapery is sunken and entirely devoid of any points of lighting; or again I see in a large head an entire want of sparkle in the white portions of the eyeballs, and the white shirt front and cuffs and collar, are as degraded as the light suit of clothes in which the sitter was arrayed. Any amount of similar examples could be stated.

Let any of such be taken in hand, and, with the brush only just moistened with the solution, those prints are merely touched on the dry prints, in a few seconds the result is seen. I am aware that with some of my pupils this mode of treating a faulty print offers great attraction, and, once it is accomplished, the inducement is very great to overdo matters,—judgment must be displayed; the results, however, are very striking.

When dealing with gelatino-chloride prints that have been finished but are in the scrap form, all that remains to do is to wash well and then lay them down again on their enamelling supports.

It is not only in chloride of silver printing that this treatment becomes invaluable, it is equally applicable to bromide working, and perhaps in no other way can such absolutely pure high lights be obtained, when dealing with enlargements, as by this means.

Dirty degraded skies, or any portion of them, can be lightened up, and strong patches of pure high lights made to stand out in bold relief with the greatest of ease, and in many cases an entire background is removed without in any way injuring the detail of the picture. In machinery working, perhaps more than in anything else connected with photography, recourse has to be had to a tedious blocking out of undesirable surroundings, whereby the machinery is made to stand out in bold relief; in such case the working on the print in the manner I have indicated will yield the most happy results. There is really no difficulty, even when working on prints of very large dimensions, provided they are taken in hand in a suitable condition of moisture and the brushes are not overcharged.

Under such conditions a steady hand will be able to trace round the finest line or band without doing any serious damage by overlapping, and, should any small portions suffer by reason of careless manipulation, the blacks are easily filled in, as every one knows.

Many workers imagine that the introduction of a white, or removal of a black portion of a print is an operation beyond the power of a photographer; this is not so, and, the larger the print, the more easy it is of accomplishment.

In enlarging I look upon the after making up of the print as a matter of primary importance when faulty negatives are being dealt with. The blacks are easily strengthened, and the half-tones also, by the application of suitable medium made to level down, and the absolute high lights are worked in also by a brush, but not with colour, as some imagine.

To many this chemical retouching may appear difficult and dangerous of accomplishment; not so, however. The three factors to bear in mind are, first, the brushes must not be overcharged; and the solution not

too strong; and wide expanses of surface are best treated with cotton-wool.

T. N. Armstrong.

PHOTOGRAPHING ROYALTY.

In the February number of the *Windsor Magazine* appears an interview with Mr. J. Russell, who tells many interesting things concerning his royal sitters. "So far as my own experience goes, the royal personages who have been good enough to favour me with sittings have always done so with the utmost readiness, and without the slightest trace of boredom. Sometimes, indeed, the occasions have been productive of the greatest merriment. A few years ago I was three weeks on board the *Osborne*, taking groups every day, and frequently the sitters seemed to find a great deal of amusement in the proceedings."

"In what language are you usually addressed at foreign courts?"

"Invariably their Majesties speak English, and perfect English too. I may say that nowhere have I heard more beautiful English than that spoken at the Russian court. There was not the smallest hint of accent about it."

"Have royalty the same desire to see proofs of their photographs as ordinary mortals?"

"Certainly; and in many cases duplicate sets have to be sent to other members of the royal family."

"Do royal sitters purchase many of their own portraits?"

"Oh, yes. Sometimes an order has come in for as much as 300*l*. They must of necessity give away a great number in the course of a year, I should think; and that is not only a fortunate thing for the favoured recipient, but it is likewise fortunate for the photographer."

"For delightful personality," says Mr. Russell, "it would be difficult to find any one to eclipse the Princess of Wales, consequently photographing at Sandringham is exceptionally pleasant work. There is such perfect naturalness, and one might almost say homeliness, about the Princess and her daughters. They take the liveliest interest in the portraits, the grouping, and general arrangement, and they chat with such easy graciousness, one is more than sorry when it is over. The Prince of Wales, too, is most thoughtful, and remembers faces and events with wonderful accuracy. On one occasion, when I was at Coburg, the Prince of Wales saw me, and, after returning my salute, stopped and said, 'There will be a party at Rosenau to-morrow. You might get some good groups if you go,' and he asked the equerry to get a pass for me. I thanked his Royal Highness, and then went to the palace with the equerry, who then left me while he made application forthwith to the Hofmarshal. He returned, however, with the information that it was to be a private meeting, and that, in consequence, no passes could possibly be issued for that occasion. I was coming down the grand staircase again when I met the Prince of Wales coming up. 'Well,' he said, 'is it all right? Have you obtained a pass for the gathering I told you about?' I informed him as to the result of my application. 'Oh, they don't understand!' he replied; 'I'll go and see what I can do.' And he left me, an official bringing me word almost immediately that, if I would be at a certain restaurant, which was close to Rosenau, they would send for me when they were ready to be photographed. I did so, and was summoned in due course to take photographs of the royal personages and their guests. The occasion was a particularly interesting one, it being the celebration of the betrothal of the present Emperor and Empress of Russia (then the Tsarevitch and Princess Alice of Hesse). I remarked to the Tsarevitch that I had had the honour of photographing him about twenty years before with his father. He replied at once: 'Yes, it will be exactly twenty years ago.' I had taken a number of plates of various groups, and at last the Prince of Wales, who had been suggesting and directing throughout, said, 'And now is there any one else you wish to photograph? I should think you have every one.' I replied that I would like to take a special plate of the German Emperor, as I only had him in a group with others on this occasion. 'The German Emperor is wanted,' the Prince of Wales called out. 'Where is the German Emperor?' His Majesty came and said, 'You have taken me alone so many times before, you can't want me again!' 'But I have never taken your Majesty in that uniform,' I protested; and he laughed and consented to the ordeal."

"The first time I ever had the honour of taking photographs at a foreign court," continues Mr. Russell, "was at Berlin, on the occasion of the marriage of Princess Margaret (the daughter of the Empress Frederick) to Prince Charles of Hesse. Later on, the Empress Frederick was good enough to allow me to take photographs of her house, 'Friedrickshof,' at Homburg, and then I was wonderfully impressed with her pleasant, unaffected bearing. She said she would like to show me over the grounds, and point out which she considered the finest views; so, throwing a wrap over her head and shoulders, she there and then took me round, and seemed to evince such an interest in everything and to be so pleased when she saw that I was delighted with the scenery. The Empress Frederick is an exceptionally interesting sitter. Being an accomplished artist, she will go into the general details of the photographs, and herself arrange the background and surroundings with the utmost intelligence and skill, and she spares no pains to get just the effect she desires. The first time I was summoned to Potsdam to photograph the present Emperor remains very vividly on my mind. The appointment was for eight o'clock in the morning. I was in Berlin one evening when the telegram arrived, and had to leave very early next morning in order to reach Potsdam at the hour named. By a most unfortunate misunderstanding, however, the man from my hotel drove me in the morning to the wrong station in Berlin. When we got there, we found was no train to Potsdam, and, what was still more vexatious, we had there lost the one from the other station. There was nothing for it but to wire to His Majesty, and, in a most uneasy frame of mind, I eventually reached the palace by about 8.30. The officials received me with various remarks to the effect that His Majesty was not in the habit of being kept waiting, &c., and advised me to get my camera ready with as much dispatch as possible, and then they would ascertain His Majesty's pleasure regarding my backsliding self—all of which was not particularly reassuring. As soon as I was ready, the Emperor came out (I was to photograph him in the open air in front of the palace). I immediately expressed my regret at the unfortunate delay. 'Oh, I quite understand how it happened,' he replied, most affably; 'pray say no more about it.' And thereupon he began to speak about the work in hand. I was most anxious to have him photographed in more than one uniform, if possible, but hardly liked to suggest it, as it would take up still more of his time. However, he immediately consented, and, after being photographed in the uniform of an honorary English admiral, he quickly reappeared in a German uniform, and he then favoured me with a sitting on horseback as a finale. When he was riding away, he turned again and said, 'The Empress will let you know when she will be at liberty to see you.' Later on, a telegram came to my hotel, naming the hour when Her Majesty would be disengaged. When I arrived again at the palace, she herself took me through the various rooms, in order that I might select which would be the most advantageous for the photograph. Then she suggested various flowers which she thought would look effective, and she had them brought, and arranged them experimentally. She was very bright, and chatted most freely concerning the photographs."

ROYAL PHOTOGRAPHIC SOCIETY'S COUNCIL ELECTION.

A correspondent, a member of the Royal Photographic Society, writes us: "I venture to send you a forecast of the probable result of the election for Council of the Royal Photographic Society, which takes place on Tuesday, February 9. Perhaps you might like to publish it. I have chosen my list of names from those receiving the greatest number of nominations; and, therefore, as evidencing the wishes of those members of the Society who have so far interested themselves in the Election of Council as to indicate whom they would wish the Society to be governed by."

President.

The Earl of Crawford and Balcarres.

Vice-Presidents.

T. R. Dallmeyer; Chapman Jones; J. W. Swan; Sir H. T. Wood.

Council.

Thomas Bedding.	Major Lysaght.
T. Bolas, F.I.C.	A. Mackie.
F. A. Bridge.	J. W. Marchant.
J. Bulbeck.	J. C. S. Mummery.
J. Cadett.	J. Spiller.
E. Clifton.	J. A. Sinclair.
A. Cowan.	E. J. Wall.
W. E. Debenham.	H. Snowden Ward.
Frank Haes.	L. Warnerke.
F. E. Ives.	Horace Wilmer.

Treasurer.

G. Scamell.

ROYAL PHOTOGRAPHIC SOCIETY: CAPTAIN ABNEY'S RESIGNATION.

The following appears in the last number of the *Royal Photographic Society's Journal*:—

"In the last issue of the *Journal* I gave my reasons for resigning the honourable office of President of the Society. Had I been able to quote the resolution passed by the Council to which I referred, I should have given it in my statement. As it seems that my interpretation of it has been challenged, I now quote it by the favour of my late colleagues:—

"'That of those elected as Vice-Presidents and ordinary members of Council at least five shall not have served in either capacity within the preceding year, any retirement rendered necessary being by seniority of service.'

"I have nothing to add to what I previously wrote, except to remark that my objection to the principle proposed would hold good if but one member of Council were disqualified instead of a possible five.

"It has been hinted that my opposition is due to the effect it will have upon myself personally. Whatever weakness I may have, it certainly does not lie in the desire for continuous office-holding; but, even if it were so, and if it were sufficiently strong to make 'self-seeking' capable of warping my judgment as to what I thought to be for the best interests of the Society, the Council left my mind perfectly unhampered by passing the resolution 'that Past Presidents of the Society shall be exempted from this recommendation.' It will be seen, then, that, however looked at, my opinion of the principle of 'disqualification' is as unbiassed, at all events, as that of those who wish to give it a place in the Articles of Association. W. DE W. ABNEY."

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

COLLODION EMULSION QUERY.—H. Tolpie asks: "Can you tell me if bromide of ethyl is an article of commerce, and if so where I can obtain it. I want to try it in collodion emulsion in order to get rid of the crystalline matter formed by double decomposition without the trouble of washing the emulsion. Do you think the plan is feasible, and has it ever been done before?"—The bromide of ethyl can be obtained from Hopkin & Williams, but we cannot say anything as to the practicability of the plan. We believe it has been suggested before, but, as we never heard of its proving successful, we assume that it does not work out in practice so favourably as it looks on paper.—EDS.

STAINED FINGERS.—APPRENTICE writes: "Can you give me any assistance? if so, I shall be deeply obliged. My parents have apprenticed me to a photographer, and, of course, I have to do a lot of the drudgery, including sensitising paper. Do what I will, I cannot avoid stains. I first tried indiarubber gloves, but they were awkward, and the head printer eventually made me give them up. I have used lifting forceps and every care, but the silver will get about me, and, as I spend most of my evenings at musical parties and the like, my hands are a constant source of trouble to me, for my friends do not understand the stains. I may say I have used cyanide until my fingers are so sore that I dare not use it any more, and, for the same reason, pumice stone is no use. Can you or any reader help me?"—By all means discontinue the cyanide if that is the result of its use. Perhaps a little more practice in handling the paper will get over the difficulty; meanwhile perhaps some of our readers may suggest something.

CARBONATE OF SODA.—H. Lawrance says: "I have a developing formula in which anhydrous carbonate of soda is included instead of the ordinary crystallised. I may say that it was given to me by a friend who prides himself on being a 'chemist,' and he says that ordinary carbonate of soda is too uncertain a product to be relied upon, and insists on the anhydrous salt. The formula is, undoubtedly, a good one, better than any I have tried, but I have great difficulty in obtaining the anhydrous carbonate. How can I convert the crystals to the anhydrous state: I suppose that is possible? Or can I calculate or ascertain by testing the relative value of any sample of crystals?"—Your "chemical" friend is a hair-splitter, and, being such, a "chemist" ought to know that "anhydrous" carbonate of soda is at least as "uncertain a product" as the crystals unless freshly dehydrated every time of use. We should advise you to calculate the relative proportions of crystals to use in place of the anhydrous (286 parts of the former for 106 of the latter), and stick to that. Your crystals will have to be very far wrong to lead you much astray.

Our Editorial Table.

THE EAST NORFOLK ANNUAL.

Published by the East Norfolk Printing Company, Regent street, Great Yarmouth.

THIS volume is full of such local, official, and general information as is best calculated to make it a useful remembrancer for inhabitants of Great Yarmouth and Lowestoft. It is, in fact, the Whittaker of East Norfolk. There are portraits of civic officials, statistics of fishing vessels, tide tables, a list of carriers, and many other features. We note an excellent account of a *Hasty Trip through the Rows of Great Yarmouth*, with which famous but narrow thoroughfares every visitor to Great Yarmouth is, of course, familiar. Doubtless, next July, many of our readers will endeavour to secure photographs of some of them, on the occasion of the assembling of the Photographic Convention of the United Kingdom in the East Coast town.

EVERYBODY'S GUIDE TO PHOTOGRAPHY.

By OPERATOR. London: Saxon & Co., 23, Bouverie-street, E.C.

AN old and practised hand may be discerned in this little book, which has been compiled with the view of "giving up-to-date information and practical instruction in all branches of photography." This programme has been conscientiously carried out, and the result is a useful guide, freely illustrated, which, without superfluity of language or floridness, takes the reader through most branches of every-day photography. It is a book that we have no hesitation in recommending to the beginner.

CATALOGUE RECEIVED.

Lévy et ses Fils, 25, Rue Louis-le-Grand, Paris.

A CHANCE inquiry of a friend in Paris as to the identity of the successors of Messrs. Ferrier & Soulier, the once well-known stereoscopic transparency makers, brings us the catalogue of the firm that is still carrying on the business. This catalogue lists many thousands of stereoscopic and lantern slides of scenes in France, Algeria, Tunis, Italy, Spain, Portugal, Austria, Switzerland, and many other countries of the world. We observe that the transparencies are stated to be made by the albumen process.

LA TRIPLICE PHOTOGRAPHIQUE ET L'IMPRIMERIE.

By ALCIDE DUCOS DU HAURON. Paris: Gauthier-Villars et Fils.

THIS book, which extends to nearly 500 pages, deals with the three-colour work and experiments of Louis Ducos du Hauron. The earlier chapters treat of the theoretical aspect of three-colour work, and are succeeded by a section touching on the preparation and use of the screens; optical considerations, and the various applications of the principles of tricolour photography also receive exhaustive attention, and a chapter is written upon anaglyphic pictures. The work appears to be a complete exposition of theory and practice, and has some useful historical notes.

News and Notes.

THE Goldsmiths' Institute Camera Club's Annual Exhibition takes place on February 18, 19, and 20, in the Technical Museum of the Institute.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C. Wednesday next, February 10, Members' Open Night, Slides, &c., *Great Yarmouth and Neighbourhood*, Mr. Lewis Medland.

THE *employés* of Mr. Jonathan Fallowfield hold their Second Annual Smoking Concert at the Duval Restaurant, 17, Newgate-street, on Friday, February 12. Mr. F. W. Hindley will occupy the chair.

MESSRS. ADAMSON BROS., electricians and photo-light specialists, have amalgamated with another firm, and have removed from 18A, Eldon-street. All communications should now be addressed to Allan & Adamson, Limited, 88 & 90, Tabernacle-street, London, E.C.

THE NEW LAWYER.—"Gentlemen of the jury," said the attorney for the man who had been sued for breach of promise, "my learned brother, who represents the fair plaintiff in this case, is trying to work upon your sympathies, and to do it has gone outside the facts. He has talked at length about his client's broken heart, in spite of the fact that no evidence has been introduced to show that her heart is broken or ever has been broken." (Sensation on the other side.) "Gentlemen," continued the lawyer, impressively, after a pause, "I don't believe her heart is broken, and, although on such short notice I am unable to produce any evidence of the exact condition, I think I can convince you that I am right. Do you suppose that my learned brother would have let a matter that would affect the case so seriously stand upon a mere statement if her heart was really broken? You know that he would not. That might have been permissible before the days of X rays, but it is not now. If her heart is broken, why does he not produce a photograph of it and prove his statement? Gentlemen, he dare not. He knows that the cathode rays would show a healthy and sound heart." And the jurors gave a verdict for the young man without leaving their seats.

T a General Meeting of the Society of English Artists, held at the Regent lery, Regent-street, the following resolution was passed respecting the e of the Society, to which the Royal Society of British Artists has raised an ection :—"That there is no legal obligation on the part of the Society of glish Artists to change the name as suggested in the letter received from Secretary of the Royal Society of British Artists, as there is no infringe- nt of title, as alleged ; at the same time there is a feeling that the similarity names is objectionable, and, therefore, we, as a young Society, are desirous meeting the wishes of the older body, and, with this view, it be resolved to r the name to the Society of English Painters."

HOTOGRAPHERS' ANNUAL ASSEMBLY.—On Wednesday the photographers of rdeen held their Third Annual Assembly in the Albert Hall. Dancing menced at eight o'clock to music by Miss Anderson's band. At eleven ock the company adjourned for supper under the chairmanship of Mr. rge Morgan, F.R.P.S. After a few remarks by the Chairman and the al votes of thanks, dancing was recommenced and kept up to an early r. The arrangements were carried out by the M.C.'s, Messrs. W. L. n, jun.. and D. Milne, assisted by the other members of the Committee— ssrs. W. Balneaves, J. E. Henderson, J. Milne, and T. R. Watson, who also iently performed the duties of Secretary.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

ruary.	Name of Society.	Subject.
8	Camera Club	Captain Abney, C.B., F.R.S.
8	Ealing	*Intensification and Reduction.* A. Ernest Smith.
8	Ireland	Opening of Exhibition (Full-dress *Conversazione*).
8	North Middlesex	*Intensification and Reduction.* J. McIntosh.
8	Nottingham	*At Home Subjects.* W. Thomas, F.R.P.S.
8	Richmond	*Architectural Photography.* H. W. Bennett, F.R.P.S.
9	Birmingham Photo. Society	*From Lucerne to the Lakes Maggiore and Como.* A. E. Bayliss.
9	Hackney	Enlarging Demonstration. J. O. Grant.
9 3	Ireland	Annual Exhibition.
9	Munster	Demonstration on Chemical Enlarging. R. E. Doran.
9	Royal Photographic Society	Annual General Meeting.
10	Ashton-under-Lyne	*Half-tone Negative-making by Artificial Light.* William Shaw.
10	Borough Polytechnic	Demonstration by the Cresco-Fylma Company.
10	Croydon Camera Club	Seventh Annual Meeting.
10	Leeds Camera Club	*Trip to Norway.* Major Norwood.
10	Leytonstone	*Flower Studies and How to Make Them.* J. Carpenter.
10	Photographic Club	*My Holiday Tour: Great Yarmouth and Neighbourhood.* Lewis Medland.
11	Aston	*Practical Enlarging.* G. Priddin.
11	Camera Club	*The Making and Exhibiting of Living Photographs.* Birt Acres.
11	Darwen	Lecture: *Pictorial Photography.*
11	Stockport	*Flashlight Photography.* J. W. Buckley.
11	Liverpool Amateur	*The Artigue Process.* J. A. Sinclair.
11	London and Provincial	*The Backing of Plates.* A. Haddon.
11	Manchester Photo. Society	*Flashlight Photography.* H. Wade.
11	Oldham	*Enlarging.* James Whitehead.
11	West Surrey	Discussion: *Plates and How to Use them.*
11	Woolwich Photo. Society	*The Preparation of Chemical Solutions Useful in Photography.* W. H. Dawson.—Slide-testing Night.
12	Bournemouth	*Carbon Printing.* H. Maitland Roberts.
12	Bromley	*Practical Hand-camera Work.* Walter D. Welford, F.R.P.S.
12	Croydon Microscopical	Discussion as to a Circulating Photographic Portfolio.
13	Halifax Camera Club	Prize Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ANUARY 28,—Mr. A. Haddon in the chair.
r. E. J. WALL addressed the meeting on

LIGHT,

n with the help of Mr. T. E. Freshwater, performed some interesting ex- eriments. The lecturer commenced by describing what light was. By means f diagram he showed a representation of the particles of ether, a medium f hich we had no proof, but which was, nevertheless, supposed to exist and ervade all space. The vibration of this ether gives us light, which, it was oted out, was absolutely invisible in itself, and it was propagated in the th by wave-motions. This effect was shown upon the screen, the dots epresenting the particles running up and down, but not forward. Regarding he statement that light travels in straight lines, he showed this to be the case y means of a cloud of tobacco smoke, from the Chairman's pipe, being irected across the path of the rays proceeding from the lantern. Although ig was invisible in itself, it had been manifested to the eye by its encounter rith the smoke, which provided a reflecting medium, where before there was ot ing to render the light visible, and this brought one to the subject of scattered reflection. That light was invisible if there was nothing to reflect it had been proved by Tyndall in a very pretty experiment. Taking an iron tube, in which was fitted a glass window, he had heated it to a very high temperature in order to thoroughly burn all particles of dust which might reflect light, and then passed through the window a beam of light. Nothing was visible, but the moment an ivory ball was raised into the path of the rays it reflected the light to the observer's eye. Therefore anything which reflected light enabled one to see light. It was obvious that nothing could be seen in a darkened room, but directly a light was struck the shape and colour of things could be made out, and this effect was entirely due to scattered reflection. By means of a mirror the lecturer produced definite or total reflection, as distinct from scattered reflection. The light from the lantern was then thrown upon a cylindrical vessel of water, and the effect of scattered reflection demonstrated by the addition of a quantity of milk. Coming to the question of regular reflection, such as by a mirror, there were several laws to deal with. The angle of reflection was equal to the angle of incidence, and this was expressed by a well-known diagram upon the blackboard, and practically shown by the use of a mirror. If the incident light fall at a very oblique angle to the reflecting surface, total reflection is obtained, but, when the angle is less acute, refraction also comes in. This phenomenon was experimentally shown with the aid of a special tank partially filled with water. The light from the lantern was passed through a slit in the top and the beam refracted into the water, and, by altering the angle, total reflection, either from the upper or lower surface of the water, was again shown. Accompanying refraction was, of course, the index of refraction, and Mr. Wall proceeded to sketch a method of measuring the same. Although the index of refraction was not of interest to photographers as a rule, by its means the optician was enabled to determine the form to be taken by his lenses, and he proceeded to illustrate the different refractive indices of various substances, including flint glass, Iceland spar, dense flint, and crown glass. Placing prisms of these substances one above another in the path of the rays, he pointed out the positions on the walls of the room of their respective refractions as follows, commencing with the least refractive: (1) crown glass, (2) flint glass, (3) Iceland spar, (4) dense flint glass, proving that glasses of different composition had different refractive power. This property enables the optician to construct achromatic lenses. Mr. Wall then showed that it was possible to counteract the refraction of one substance to a certain degree by its combination with another. By means of a direct-vision spectroscope—a combination of flint and crown glasses in which the refraction of the glass is destroyed, but not its dispersion—a spectrum was projected upon the screen, and another immediately above this by a spectroscope composed of prisms of thallium glass. The latter yielded a much longer spectrum, illustrating the difference in dispersion between the crown and flint and the thallium glasses. Lenses practically consist of a series of prisms of different angles, and by varying the angles of his prisms an optician can make achromatic lenses by using two glasses; but with more glasses, as in the case of the newer lenses, it is rendered possible for him to achromatise his lenses for two or even three spectrum rays, and so to obtain better correction. White light which has been split up to form a spectrum should be very easily recomposed into white light. Messrs. Newton & Co. have made a very ingenious device, in which the spectrum colours have been made artificially, and have been properly tested, to produce this result. It takes the form of a slide, consisting of bands of colour radiating from its centre, which, being rapidly revolved in the lantern, produces a blending of the colours approximating to white light. This was also shown by interposing between the spectroscope and the screen a large lens, which gave a fair representation of the white light, save for a fringe of colour due to the non-achromatic lens. Spectre were shown by means of diffraction gratings of 3000 and 5000 lines to the inch. Diffraction by small perforations in a zinc plate was shown, and by interposing a prism a spectrum resulted, owing to the holes acting similarly to slits, with a curious mixture of colours. Water-marking effects, produced by crossing cross-line screens at various angles, were displayed upon the sheet, as also the phenomenon of interference, utilised by Lippmann in his process of colour photography, by a beam of light impinging upon a piece of mother-of-pearl. The effect was due to the many extremely thin layers of carbonate of lime of which the mother-of-pearl is composed. Mr. Wall concluded with a number of kaleidoscope effects.

Mr. J. A. SINCLAIR described how, accidentally placing his fingers in front of the objective, when showing some slides of fishes' scales, he had produced some very beautiful colour effects, and inquired how the cutting off of the light had caused this.

Mr. WALL could only suggest that he had practically made a slit of his fingers. It was well known that, to a certain extent, fishes' scales were of the same substance as mother-of-pearl; one would get all the phenomena of diffraction, and so the colours.

Votes of thanks were passed to Messrs. Wall and Freshwater for the demonstration, and to Messrs. Newton & Co. for the loan of the necessary apparatus, and

The HON. SECRETARY announced that they proposed to continue the work by some experiments with polarised light on February 25, the next Open Night.

PHOTOGRAPHIC CLUB.

JANUARY 27,—Mr. Frank Haes in the chair.

The evening was devoted to the annual Ladies' Night. The programme consisted of a series of lantern slides by Messrs Spiller, Welford, Newell, Mrs. Snowden Ward, Fry, Lee, Bridgman, Fraser, Hindley, Fall, Haes, Cembrano, Evans, and Williams. The musical portion of the entertainment was contributed by Miss Louisa Pyne and Miss May Tindall, Messrs. Bennett, Welford, Bridge, and McConnell. The whole was under the able direction of Mr. F. A. Bridge, whose efforts to please were thoroughly appreciated by an audience which filled the large hall at Anderton's Hotel.

Brixton and Clapham Camera Club.—On Tuesday, January 4, the Annual General Meeting was held at Brixton Hall, Mr. W. Fraser (Vice-President) in the chair. A letter was read from the President (Mr. J. W. Coade) regretting his inability, through illness, to attend, and stating this to be his first time of absence from the annual meeting, since the Club was founded. The eighth annual report was then read by the Secretary, showing the Club to be in a highly prosperous condition. The only alteration of rules was an addition providing that Club business should be suspended at 8.30, when a lantern show or demonstration is to follow. The following were elected as officers of the Club for 1897 :—*President :* Mr. J. W. Coade.—*Vice-Presidents :* Messrs. E. Dockree, W. Fraser, A. Horsley Hinton.—*Council :* Messrs. C. F. Archer, J. Gunston, R. G. F. Kidson, J. Price, G. W. Welham, W. H. Whittard.—*Hon. Auditors :* Messrs. F. J. Burgoyne, L. E. Cotterell.—*Librarian and Curator :* Mr. W. H. Stoneman.—*Lanternist :* Mr. R. G. Mason.—*Delegates to A.P.S. :* Messrs. E. Dockree, F. W. Levett.—*Recorder :* Mr. A. Whittaker.—*Hon. Secretary :* Mr. F. W. Levett.—*Assistant Secretary :* Mr. J. R. Welch.

Croydon Camera Club.—There was a full room on Wednesday evening, the 27th ult., when Mr. A. E. Isaac opened a discussion upon

THE EXPOSURE AND DEVELOPMENT OF SNOW SCENE NEGATIVES.

He advocated a somewhat brief exposure, viz., about half the normal, and that development should not be pushed too far, but rather that a thin, although not weak, negative should be obtained, and full printing density secured by intensification. An animated discussion ensued, in which Messrs. J. Smith, Kough, Richardson, Carley, Packham, Langfier, Hirst, and A. Jenkins took part, and also showed negatives or prints in illustration of their contentions. The PRESIDENT (Mr. Hector Maclean), in closing the discussion, remarked that the differences in amount of exposure, ranging from thirty-five seconds down to one two-hundredth of a second, related by members, are explicable by the different object each had in view. He thought that the secret of good snow scenes lay more in effective lighting than in absolute correct exposure. A cordial vote of thanks to Mr. Isaac was carried by acclamation. Following the above, Mr. ADOLPHE LANGFIER showed and explained great part of the mechanism of the improved model of the

GRAND KINEMATOGRAPH.

The machine in question was compared with the original design (the one used at the last lantern show) and the various improvements pointed out. Without entering minutely into technicalities, the main improvements consisted in less power being needed to work the machine, much less noise, less flicker ; finally, much steadier pictures were obtainable, due to an improved film perforator, which ensures accurate registering. Mr. Langfier showed a number of positive and negative reels of celluloid photographs, including a set of 1200 snap-shots taken about 11.30 on that same morning of skating at the Morland pond. He also handed each member a print taken from one of the above negatives, about fifty prints being thus distributed, all made within the course of about six hours. The estimated exposure of the foregoing negatives was between one-two-hundredth and one one-hundredth of a second. Mr. T. J. HARRISON, who, on behalf of Messrs. Bender, constructed the improved grand kinematograph, from the designs of his son, Mr. G. H. Harrison, explained some of the technical difficulties which had to be surmounted in perfecting the machine. Many questions having been put and answered, the meeting accorded Mr. Langfier a loudly expressed vote of thanks. Mr. Kough was selected to audit the accounts for presentation to the annual meeting. The Mayor (Coun. Martin Luther Moss), with several other gentlemen, was elected a member of the Club.

North Middlesex Photographic Society.—February 1, Mr. Mummery in the chair.—Mr. W. Willams showed an actinometer in the shape of a small metal box with an opal lid, with graduated numbers underneath, made by Wynne, which seemed very compact, and likely to prove useful. The first special lantern-slide competition then took place, members voting on the slides as they were thrown on the screen. Three slides were passed through at a time, and they were gradually weeded out. Mr. A. H. Lisett proved the winner, with a charming little view of sea and a sunset sky. This, and several others were selected by the Lantern Committee to form a Society set. At the conclusion, the President announced that next Monday, February 8, Mr. J. McIntosh would give his paper on *Intensification and Reduction.*

Polytechnic Photographic Society.—January 28, Mr. R. F. Pearce in the chair.—A great number of lantern slides were shown ; indeed, the members responded so heartily that many were left for the next show. The Hon. Secretary operated at the lantern, and each exhibitor explained his slides. A series of about forty views, *Up the Thames*, by the Chairman, were first thrown on the sheet, some of the pictures calling forth great applause. Of the smaller sets, those by Mr. F. Locke and Mr. Readless, the latter consisting of military subjects, taken with a Griffiths camera, were the best. Altogether about 150 slides were passed through the lantern. February 11, commencing at 8 p.m., for beginners, a plate will be exposed and developed by the Hon. Secretary. At 8.30 an open discussion will take place.

Birmingham Photographic Society.—The Second Annual *Conversazione* was held at the Grosvenor Rooms, Grand Hotel, on Tuesday, January 26. About 160 members and friends spent a very enjoyable evening. Dance music was provided by Mr. Alfred Gregory's band.

Cardiff Photographic Society.—January 22.—A paper was read by Mr. W. J. JENKINS on

PLATINOTYPE PRINTING.

Confining his remarks to the "cold-bath" process, Mr. Jenkins gave a very interesting description of the subject. After describing in detail the points that recommended his own plan of working, he proceeded to develop a large number of variously exposed prints, using in the main a solution of oxalate very largely diluted with glycerine. This solution (one in eight) was o value in controlling the development of over-printed proofs, and assistance from stronger solutions enabled him to exercise a great de local treatment when this was necessary. All the solutions were appli a brush. The demonstration was most successful in showing what a process this could be made, and the results in Mr. Jenkins's hands w that could be desired.

JANUARY 29, a short paper was read by Mr. C. E. HANCOCK on

PHOTOGRAPHIC OPTICS.

The paper was followed with interest by the members, who agreed t subject deserved more attention than photographers usually gave it. lecturer, at the close, recommended that all should obtain the late Mr. Taylor's most interesting book on the subject.

Leeds Camera Club.—The members had an intellectual treat on W day evening, January 26, when Mr. S. MARGERISON addressed them on

CHURCH NOTES FROM VARIOUS COUNTRIES.

There was a large and appreciative audience, which was held almost bound by the lecturer. He went most exhaustively into the subject of architecture, from very Early English to the present time, and treat subject in a terse, masterly manner. The lecture was illustrated lantern slides, the great majority of them being the lecturer's own work.

Liverpool Amateur Photographic Association.—January 28, th sident (Dr. J. W. Ellis) in the chair.—Messrs. Alexander Prentice, J. W. Bore, T. Williams, G. Y. Tickle, J.P., and Thomas Clarke were members. The medals awarded in the recent annual competition we sented to the successful competitors, after which the President ann that a radical change had been made in the rules for the next comp classes being abolished. Further particulars will be found in the report, which will shortly be in the hands of members. The H Secretary announced that the Society had won a prize of 10*l.* 10*s.* i for the library, offered by the proprietors of *Photogram*. Mr. JOHN E was then called upon to deliver his lecture, entitled

FROM WEST TO EAST OF THE DINARIC ALPS.

It was illustrated by about 120 slides from negatives taken by the during a tour last summer, and proved to be of an extremely inte character, numerous places in Dalmatia, Herzegovinia, and Bosnia visited. A vote of thanks to Mr. Bushby concluded an enjoyable e

FORTHCOMING EXHIBITIONS.

1897.

February 5–27 ..... Glasgow *Evening Times* Camera Club. The Secr *Evening Times* Camera Club, 46, Gordon Glasgow.

February 8–13 ..... Photographic Society of Ireland. Hon. Secretary, E. Smyth, 35, Dawson-street, Dublin.

„ 25–27 ..... Woolwich Photographic Society. Hon. Secretary, Machen, 161, Griffin-road, Plumstead, S.E.

March 6–13 ..... South London Photographic Society. Charles H. O 30, Henslowe-road, East Dulwich, S.E.

Patent News.

THE following applications for Patents were made between January January 27, 1897 :—

STEREOSCOPIC APPARATUS.—No. 1336. "Improvements in Stereosco other Photographic Apparatus." H. J. H. MACKENSTEIN.

CAMERAS. — No. 1482. "Improvements in Photographic Cameras Accessories therefor." ALBERT HILL and THE CRESCO-FYLMA PANY, Ltd.

CAMERAS.—No. 1483. "Improvements relating to Photographic Ca ALBERT HILL and THE CRESCO-FYLMA COMPANY, Ltd.

SCREEN KINETOSCOPY.—No. 1569. "Improvements in Mechanism for a Series of Instantaneous Photographs upon a Continuous B Film and for Projecting the same upon a Screen." R. E. GILL.

DISSOLVER AND SLIDE-CHANGING APPARATUS.—No. 1610. "An El Dissolver and Slide-changing Apparatus for Optical Lanterns." PYNE and A. ELSEE.

FRAMES.—No. 1625. "Improvements in Photograph and similar Frames." W. GILYARD.

SCREEN KINETOSCOPY.—No. 1676. "Improvements in and Additi Apparatus for the production of Animated Photographs." C. A

COUNTING MECHANISM.—No. 1698. "Improvements in or relating to C Mechanism for Photographic Cameras." H. J. REDDING.

CAMERA.—No. 1711. "Reflecting Type Camera." G. HARROP.

SCREEN KINETOSCOPY. —No. 1808. "Improvements in the Means Mode of Taking and Reproducing Moving and Stationary Pi J. PUMPHREY.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM: GREAT YARMOUTH MEETING, 1897.

To the EDITORS.

GENTLEMEN,—On Wednesday evening, February 10, a fine collection of slides, illustrating Great Yarmouth and surrounding districts, will be shown by Mr. Medland at the Photographic Club, Anderton's Hotel, Fleet-street, at 8 p.m.

All members of the Convention are hereby cordially invited to attend, and any prospective members of Convention, or any one interested in the locality may obtain an invitation card by applying to the Hon. Secretary of the Photographic Club, Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.—I am, yours, &c., R. P. DRAGE, *Hon. Sec.*, P.C.U.K.

ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—Members of the Royal Photographic Society who take a real interest in its welfare must feel some anxiety as to the decision of the annual meeting with reference to the proposed new rule affecting the constitution of the Council. As a country member of some years' standing, who probably, like many others, will not be able to attend the annual meeting, I venture to ask for an opportunity to express certain views, which, I have reason to believe, are shared by not a few others.

The new rule, as I understand, is to provide that, after being re-elected four times, or serving five years altogether, a member of Council must retire, whether the members want to re-elect him or not, and cannot be re-elected until a year has elapsed.

The most obvious reason for such a proposal would be, that some such regulation was necessary, in order to give opportunity for the election of new members on the Council. There is, however, no evidence that any such necessity exists. Nominations may be made by any member of the Society, and every member has an opportunity of voting. The Council roll shows that fresh members are frequently on it, and, if, on the other hand, we find that certain members are re-elected year after year, the only possible conclusion is that those members who have sufficient interest in the Society to take the trouble to vote desire to have them re-elected, and surely they are only exercising an unquestionable right when they give effect to their desire.

Since no case has been made out for the necessity of such a rule, it is impossible to avoid the conclusion that the proposed new rule is really aimed at a certain number of men who have held seats on the Council for a long time. I know nothing as to the efficiency in Council of the senior members of the Council, but they have been re-elected time after time by a majority of the members of the Society voting, and therefore it is a fair conclusion that they have gained the confidence of the members.

We certainly ought not to forget that the said members of the Council have for years given much time and trouble towards furthering what they conceived to be the interests of the Society, and, even if some of them are not sufficiently "progressive" to suit everybody, surely the Council is large enough to contain representatives of every line of policy. In any case, is it not a reasonable view that the Society should show some consideration towards those who have endeavoured to serve it for some many years? and would not the refusal of such consideration strike at one of the fundamental conditions upon which alone the continued and useful existence of societies is possible? No one, so far as I am aware, has ventured to assert that new members of Council are necessarily more efficient than old ones, and the probabilities are rather the other way.

I trust, therefore, that the annual meeting will reject the proposed new rule as being unnecessary and undesirable. Whatever the decision may be, all those who desire to see the Society in fact as well as in name, the leading (not necessarily the rushing and hurrying) photographic society in the country, will sincerely hope that the energy of the new Council will be devoted to the objects for which the Society is supposed to exist, and that the time of the Council will no longer be wasted over what seem to so many members to be unnecessary discussions about comparatively trivial details of internal policy.—I am, yours, &c.,

Weston-super-Mare, February 1, 1897. C. H. BOTHAMLEY.

[The suggested alterations of the rules of the Society do not come for discussion at the annual general meeting on Tuesday. It will probably be several weeks before members have an opportunity of discussing them; meanwhile Professor Bothamley's letter, as the utterance of a country member on the proposed "new blood" scheme will, we are sure, be read with very considerable interest.—EDS.]

PIRACY OF PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—In to-day's JOURNAL you have a few words on copyright, and say that "during the last year or two you have been the means of drawing photographers' attention to reproductions of their photographs which have turned out to be infringements of copyrights."

Last week a gentleman was in my shop when he saw a print of my photograph called *Stern Reality*, a row of boys' backs leaning over a wall, which you may have seen. He said that one of the Soap people had used this some three or four years ago, and had either given away or sold reproductions of it. He promised to try and get me one; but I am afraid he has not been able to do so. I venture to ask if you remember having seen a copy of this, as any reproduction of it is a piracy, excepting one which my London agent once allowed the *Pall Mall Budget* to use some years ago.

We country photographers are at a disadvantage, for we do not see one hundredth part of the illustrated papers, and may often seem to take no notice of piracies, simply because we do not know of them.

Last year a local printer got some blocks made from some of my things, and was advertising stereos of them in a printer's trade journal which I accidentally came across, as it happened. I was out of pocket in prosecuting him, for he was not worth powder and shot, and the expenses of the lawyer's letters added up so, as they have a habit of doing.

Two or three years ago I got 20*l.* from one of the so-called religious papers for a piracy of *Stern Reality*. I happened to pick up a copy at the railway bookstall; but one cannot hang about Smith & Sons' stall always.

The publishers, too, are deep, for they give the photographer's name even when they have stolen the print, and are making piracies.

Thanking you in anticipation,—I am, yours, &c.,

FRANK M. SUTCLIFFE.

Photographer, Whitby, Yorks, January 29, 1897.

[We are under the impression that we have seen coloured reproductions of Mr. Sutcliffe's well-known picture, but are unable at the moment to recall when or where. Possibly some of our readers can help in the matter.—EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

RECEIVED.—G. BRUCE; J. WICKENS; R. FLAMANK & SON; IN DIFFICULTIES; ANXIOUS; H. WAKEFORD; J. PENN. In our next.

MEDICO.—You simply reversed the image through gross over-exposure.

"SNARK."—We have a letter for this correspondent. Will he kindly send us his address?

K. N.—It is a curious phenomenon that we ourselves have met with, but we know of no feasible theory accounting for it.

OPERATOR.—On such data as you give, we can only surmise that some alum is left in the film before fixation. Why not try the effect of omitting the alum bath?

B. J. (Bethnal Green).—1. We should advise you to offer the copyright to some such firm as Messrs. Marion & Co., Soho-square. 2. By all means let us see a copy.

A. M.—You have omitted your name and address; hence according to our rule—published in every number of the JOURNAL—your question remains unanswered.

J. HUFF & SON.—You probably have the 1897 ALMANAC, in the formulæ section of which are several pyro-metol formulæ, to which we refer you. On the data given, we cannot give the particular formula alluded to.

PRINT.—W. KOHLER. The prints are collotype, printed in a very black ink to resemble engravings. You do not seem to be aware that collotypes can be printed in any colour, and not necessarily to resemble silver pictures.

PATENTS IN CARBON PRINTING.—LEEDS. All the patents in carbon printing have expired. The Artigue method, or the manufacture of the tissue, is not patented, so that you can work the process and make the tissue without let or hindrance.

COLLODIO-CHLORIDE PRINTING.—H. ANSON. The surface of collodio-chloride paper is a little more tender, perhaps, than that of albumen paper, but less so than, under certain conditions, is gelatino-chloride paper. A little extra care will avoid the trouble.

TONING BATH.—S. S. A. We are not at all in favour of combined toning and fixing baths that contain such things as alum, lead, &c. Separate toning and fixing really involves very little extra trouble, and that is well repaid by the probable extra permanence of the printer.

WINTER SCENERY.—M. BLAKE. Unless the light is very yellow, as it generally is at this season, no great advantage will accrue from the use of orthochromatic plates in photographing snow and frost scenes. A great advantage will be gained by backing the plates, however, and that we should advise you to do.

WINTER IN KEW GARDENS.—LONDONER. 1. Yes, many excellent pictures of snow and frost subjects are to be got in Kew Gardens. The fine old trees and shrubs, when covered with snow or hoar frost, form fine subjects for the camera. 2. A permit is required. It may be obtained by writing to Mr. Thistleton Dyer, at the Gardens.

IMPERFECT FIXATION.—PRINTER. Yours is another case of imperfect fixation. You should bear in mind that, when the solution is very cold, its action is slower than under normal conditions. Hence, in cold weather, the hyposulphite solution should either be made stronger, or a longer time should be allowed for its action. Either alternative will do.

DISTILLED WATER.—ALPHA. The condensed steam from the engine would certainly be "distilled water," but it would be far more impure than ordinary tap water owing to contamination by the lubricating oil of the cylinder set. Although this water would cost nothing, even supposing it were pure, it would offer no advantage over tap water in ordinary photographic work.

WOTHYTYPE.—A SIMPSON. A confusion. This process is not the invention of the late Colonel Stuart Wortley, though patented in his name as a communication from the inventor, one Jacob Wothly. Paper was coated with collodion containing nitrate of uranium and nitrate of silver. The process was introduced about 1865, but it was very little practised at the time, nor has it been since.

F. KINGSBURY.—Possibly this process will answer. Take a fixed gelatino-bromide print, go over the outlines with a steel pen charged with very black ink. When dry, convert the image into silver bromide or chloride, and dissolve out; or, instead of dissolving out the converted image, you can make a negative of the outlined picture, and a print from this negative will give you what you require.

VESSELS FOR SILVER EMULSIONS.—C. C. C. Copper vessels, electro-plated with silver, are not reliable for emulsions containing free nitrate of silver, as the slightest abrasion of the silver coating will expose the baser metal, which will at once be acted upon. Even with a very thick coating of silver, deposited by electricity, it is found, in practice, that the free nitrate quickly finds its way to the copper.

DISSOLVING SANDARAC.—SANDARAC asks: "Can you inform me how to dissolve gum sandarac? I want to use it in a retouching medium. I have not found methylated spirits a very successful solvent."—Alcohol is one of the best solvents of sandarac. There should be no difficulty whatever in dissolving the resin in methylated spirit, provided that and the sandarac are of good quality. Possibly the spirit used has been weak.

STAMP AND VICTORIA PORTRAITS.—COUNTRY PHOTOGRAPHER. All the necessary apparatus for the production of these portraits is supplied by all the large dealers. Consult the advertisement pages of the ALMANAC. We can, of course, give no opinion as to whether these portraits would prove a "good line" in your business. You should be a better judge of that than any one else. In some cheap neighbourhoods we believe they take well.

NUISANCE.—W. A. We do not see how you can prevent the children in the school next door looking through the studio windows and making grimaces, to the annoyance of your sitters and yourself, so long as they do not trespass on your property. Why not glaze the side windows of the studio with either fluted or ground glass, then they could not see in? That is the best thing we can suggest. The law will certainly give you no redress.

PICTURE FOR REVIEW.—R. C. We should be sorry to say anything to hurt your feelings, but you ask our candid opinion. It is that the picture is very bad. The composition is faulty to a degree, and the posing of the figures even worse. However, don't be disheartened; try on, and in the mean time study the works of the great masters of similar subjects. Pay a few visits to the National Gallery, and study the pictures shown in printsellers' windows.

WET COLLODION.—AMATEUR (Sunderland). Ruby light is not at all necessary in working the wet-collodion process. If the dark-room window faces the north, one thickness of pot-metal orange glass will be quite sufficient. This will be a very nice light to work with, though it would not do for gelatine plates. If the same dark room is used for both processes, it will be well to have a sliding sash, glazed with ruby glass, to slide over when gelatine plates are being manipulated.

F. W. ROOKEBY.—1. We cannot say precisely how long such a solution will keep; but our experience of glycin is that, made up according to formula, it keeps better than other reagents. 2. We do not think special precautions as regards light are necessary. 3. We should inclined to allow about three or four ounces for each half-plate. will, we think, find the diluted solution keep perfectly, at any rat long as you require it for this mode of development.

SMOKING IN DARK ROOM.—R. FOX. It is very unlikely that the fog on negatives was caused by the fumes from the tobacco. If they were cause, we strongly suspect there would be far more foggy negati amongst amateurs, and professionals too for that matter, than there Smoking in the dark room may, however, be a source of fogging matches are struck to light the pipe with while developing is going or the plates are exposed. Will that account for your trouble?

PINK PRINTS.—QUERIST (Wakefield). The piece of picture sent is printed carbon, but we have not seen any before of that particular col You say it was produced in France, but we are quite unable to tell by whom, or where the same colour tissue is to be obtained. The m likely source, in this country at least, would be the Autotype Compa though we doubt if they stock it. If they do not, they would, dou less, make it to order, if you require sufficient to make it worth t while.

TERMS OF AGREEMENT.—OPERATOR. We do not consider the terms of proposed agreement at all unreasonable, and we do not think, if signed it, you could get out of it on the grounds you suggest. It o restrains you from practising photography in the town at its conclusi and the town is but a very small one. If the agreement applied to country, the case might be different. Is it honest, however, to sign agreement while, at the same time, you have an idea of breaking possible?

FASHION PORTRAITS WANTED.—G. L. says: "Can you give me any idea wh portraits of fashionable ladies can be obtained who have been photograp or otherwise during the reign of Her Most Gracious Majesty, Qu Victoria? I am desirous of obtaining a collection of same, both fr paintings and portraits, showing the different fashions from the ginning of her reign up till the present day."—In reply: We are una to offer a suggestion. Perhaps, however, some reader can help correspondent.

DISSOLVED GELATINE.—C. JAMES. The trouble has been caused by washing waters being used too warm. We agree with you that "d bling in the icy cold water as it now comes from the tap makes pri washing anything but pleasant," but there is no reason why the wa should be used so warm as to cause the gelatine to run. If it be m to a temperature of, say, 60° to 65°, or even 70°, it will be no lon unpleasant to work with, and can be used with safety. With albu prints the water may be used as warm as you like without injury.

NITRATE OF SILVER.—W. & Co. write as follows: "Our firm use, at printing place, about twenty to twenty-five ounces of nitrate of silve week; in summer more; indeed, we have a standing order with for 100 ounces a month. Do you consider, with this consumption, t it would be more economical to make it ourselves, as things have t cut very fine these hard times?"—No, we do not. If the consumpt of the nitrate were very much larger than that named, it would be more profitable to purchase it, at the price it is now sold, than make it yourselves.

WET COLLODION.—S. JONES. As the collodion has been iodised over t years, and become quite brown, we doubt if you will get on very with it, as probably the film it will yield will be too rotten, also insensitive. It need not, however, be thrown away, as a little added to some that is freshly iodised will greatly improve the lat working qualities, especially for copying purposes, where the nega are to be used for photo-mechanical processes, and such as you re them for. A film of very old collodion, such as this will yield, is likely to be dissolved in varnishing, particularly if the plate be very warm, as the spirit in the varnish is strong.

A TROUBLE.—ANNOYED writes: "Last week I sent to a chemical store four dozen plates of my favourite brand. On their receipt, I not that only two of the boxes bore the same number, and there was a difference in the number of the others. On using the plates, I found two boxes with the lowest numbers were quite useless, as they sho a broad band all round the edges from long keeping. On complain I was told the plates were as received, and that dry plates did deteriorate by keeping, &c. Who is responsible?"—The chemist sold you stale plates. Why go to pharmaceutical chemists for ph graphic goods? It is much better to go to photographic dealers. T understand their business.

CHLORIDE OF GOLD.—T. W. S. says: "I have reduced one ounce of pure to the chloride, according to the formula on page 534 of THE BRI JOURNAL PHOTOGRAPHIC ALMANAC, 1892. Have done it often success, but in this last operation the solution was left on top of ra all night, and in the morning the acids were dried up, and, on dissol in water, the solution is quite brown in forty ounces of water, wit yellow deposit. Will be obliged if you can inform me what deposit is. There were thirty-nine grains of the gold undissol Nitric acid might have been weak, being old stock."—If a little mor the mixed acids and water be poured on the yellow deposit, whic gold, it will be dissolved, and may then be added to the rest of solution.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1919. Vol. XLIV.—FEBRUARY 12, 1897.

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EX CATHEDRÂ.

USUAL interest attached to the Annual General Meeting of the Royal Photographic Society, which was held on Tuesday evening last. The recent annals of the Society invested the election of the Council with considerable importance, so that no surprise was felt at the meeting-room of the Society—which has been irreverently termed "a cross between a disused bath and a glorified rabbit hutch"—being well filled with members by the time the meeting was opened by Sir Henry Trueman Wood, who took the chair.

* * *

THE formal business of the evening was varied by the exhibition of several examples of M. Chassagne's process of colour-photographs, to which we referred last week, and of which mention is also made elsewhere in the present number of the JOURNAL. Sir Henry Wood produced the specimens he was kind enough to show us, and to which we made reference last week. Mr. Wilmer, the Honorary Secretary, who has recently been in Paris, added to the exhibition several specimens which he had obtained from M. Chassagne. Among these were some fine prints and transparencies, which appeared to be more pleasing, effective, and truthful than Sir Henry Wood's results. At the same time, we gathered that the members present were not too favourably impressed by these latest productions of photography in colours, which have a by no means satisfying effect as regards the translation of colour.

* * *

THE election of Council resulted in the choice of the Earl of Crawford as President, and Mr. Dallmeyer, Mr. Chapman Jones, Mr. J. Spiller, and Sir H. T. Wood as Vice-Presidents. Mr. Scamell was re-elected Treasurer. The ordinary members of Council chosen were Messrs. Bedding, Bolas, Bridge, Cadett, Cowan, Clifton, Debenham, Ives, Rev. F. C. Lambert, Mackie, Marchant, Pringle, Sinclair, Arnold Spiller, Swan, Wall, Snowden Ward, Warnerke, P. L. Waterlow, and Wilmer. The "new blood" is represented by Mr. Ives, Rev. F. C. Lambert, Mr. Pringle, Mr. Arnold Spiller, and Mr. Snowden Ward. It is very good new blood, upon the choice of which the members are to be congratulated. But were those members who voted for the Rev. F. C. Lambert aware that that gentleman is a member of the General Committee of the Salon, an institution that is essentially hostile and antagonistic to the Royal Photographic Society? Does Mr. Lambert himself consider the two positions compatible?

* * *

OUR last week's comments upon the qualities of M. Chassagne's coloured photographs have brought us several requests for an opinion upon the results produced by the colour method of Mr. John Wallace Bennetto. We are unable to say anything about Mr. Bennetto's colour photographs, for the simple reason that we have not seen them. We are, however, informed, on excellent authority, that a frame of specimens produced by the Bennetto method was sent into the Royal Photographic Society's Exhibition last September, and submitted to the Hanging Committee, a member of which—one of the ablest photographers of the day—tells us that he was not favourably impressed with these so-called photographs in natural colours, which appeared to him no better than the kind of result produced by the old familiar "crystoleum process."

* * *

CAPTAIN ABNEY sends to last week's *Nature* a most interesting communication with regard to the colour-photography process of M. Chassagne. We reprint Captain Abney's article elsewhere. It is the utterance of a cautious man of science, who is careful not to say one word either in praise or dis-

paragement of the process that was demonstrated before him. He confesses himself a sceptic, but is anxious to test the process, and so M. Chassagne is to be provided with negatives on prepared plates, the densities of which shall give no clue to the colours of the originals, from which the inventor is to have the opportunity of making colour prints. Meanwhile the alleged property of a positive image of exercising selective colour absorption continues to excite much discussion without eliciting any explanation or theory.

* * *

Copyright is a subject upon which a great part of our recent correspondence has touched. Our hint that many copyright photographs are pirated unknown to their owners brings us several lamentations and regrets that it is impossible for the ordinary photographer to keep an eye on the whole of the illustrated press, and we are asked to suggest a means whereby photographers owning copyright photographs could be placed in possession of information relating to their infringement when such takes place. We must confess ourselves baffled on this point, but shall be glad to give those interested the opportunity of discussing the matter. But that the need for some such protective agency is a real and undoubted one must be obvious when, according to evidence with which we have been recently supplied, wealthy magazines and newspapers, notwithstanding the labours of the Copyright Union, still systematically infringe photographers' copyrights, and trust to luck, we suppose, to be not found out. On no other grounds than these can we understand some cases of infringement that have just been brought to our notice.

* * *

The Institute of Photographic Artists, of Chancery-lane, to which we have more than once lately made pointed reference, appears, from information that we have received, to be one of five or six "Institutes" or "Associations" that have been organized by apparently the same body of men. Recently a friend sent to the address named for a prospectus. The premises of the Institutes, he says, consisted of one room and the visible staff of an office youth. According to a report published in a daily contemporary, an International Society of Auctioneers and Valuers, of Chancery-lane, is engaging the attention of the Bankruptcy Court. A Mr. J. H. Wilkinson figures in the case as President of the Institute, and the name of J. H. Wilkinson appears on the prospectus of the Institute of Photographic Artists as "Organizing Secretary." Further comment would be premature pending the result of inquiries which we have reason to believe are on foot.

* * *

Messrs. Marion & Co., Soho-square, W., announce a clearance sale, which will be held from February 15 to February 27. In addition to the entire London stock of Messrs. Wratten & Wainwright, which Messrs. Marion recently bought, their catalogue includes mounts, cameras, lenses, fancy goods of all kinds, frames, purses, publications, stationery, &c.

* * *

On Wednesday evening, February 24, Sir Henry Trueman Wood, M.A., will read a paper at the Society of Arts on *Reproduction of Colour by Photographic Methods.* The subject is of unusual interest at the present time. We believe that results by both the Chassagne and Bennetto methods will be shown.

WHAT IS PHOTOGRAPHY IN NATURAL COLOURS

Of the many problems which modern science has set itself f solution, the photographic reproduction of objects in the natural colours is admittedly one of the severest. Th severity, however, is somewhat softened by the attractivene which the subject itself essentially possesses. The invest gator who attacks the problem is animated by the knowled that, apart from the new triumph which science, through hi would claim were he to reach his goal, world-wide interest his discovery would also be excited, so that his consequen fame, to say nothing of more material rewards, would be grea On the other hand, coeval with photography itself, there h always been, on the part of the public, a vague aspiration aft photography in natural colours, and thus we have a number elements combining to invest this problem of science with unique fascination.

Now, what is a photograph in natural colours? Clearly th answer to such a question is more than difficult to retur assuming, as we may, that photography in natural colours do not yet exist. But, again, are we justified in affirming th photographs in natural colours are not produced, in the absen of a definition of our meaning when we make use of the term It is obvious that this question admits of more than o answer. We might, indeed, quote from the writings of m who have been long identified with research in colour pho graphy, which show that, even among those who actually pr duce, or attempt, work of this nature, the most antagonist ideas prevail as to what constitutes a photograph in natur colours.

Let us, however, suppose that the ideal process of pho graphy in natural colours is one in which the results a directly produced in the camera. At once we say that we a limited to supposition, and are obliged to own that we a as far from the realisation of the ideal as ever we were. Th silver haloids that are impressed by light cannot yet be ma to exercise the property of yielding up coloured images by an form of development; neither has any known chemical physical treatment made those haloids colour sensitive in t sense we here specially mean; while, as regards direct colou on positive printing surfaces, fifty years of experiment ha produced virtually no results worth consideration. Thus, what might be termed direct photography in natural colou practically nothing has been done.

It cannot be denied that, not only by the general publ but also by thousands of photographers, and not a f scientific men, the "direct" method of photography in natu colours, as we have just briefly outlined it, is the only o which, if achieved, would be considered entitled to the ter It is such a process that is probably present in their min when they refer to the subject. A little knowledge a reflection would, however, reveal the extreme improbability such a process ever being worked out.

If we are right in the foregoing conclusions, much of t apathy with which the very beautiful work in colour that h so far been produced may be understood. The Lippman Lumière interference results are not only not strictly pho graphs in natural colours, but, except when viewed or projec at a certain angle of incidence, are practically of an entir indefinable order, that is to say, they are neither negative n positive. The process has not yet emerged from the e perimental stage, and at present affords little hope that it w develop into a workable method of fulfilling popular desi

gain, notwithstanding its scientific interest and the extreme auty of the few results that have been produced by it, the terference process has stood still since it was published six ars ago—a by no means encouraging sign.

Theoretically, but not practically, three-colour work approaches somewhat near to the requirements of the case. The ssibilities of the process are great for the purposes of production of very many subjects in colours; but the ture and difficulties of the process deprive the individual otographer of the opportunity of employing it. The etched ock and the typographic printing press appear to swamp the rely photographic parts of the process, and incline many to fuse to consider it, however worked, as a method of photoaphy in natural colours.

Three-colour collotypy makes little advances, and needs no rther reference, but the three-colour process on glass, so successfully studied and perfected by Mr. Ives, is, in the beauty d fidelity of its results, deserving of the highest praise. It however, based upon physical principles, is not pigmentary, d is not available for many purposes. It would serve useful purpose if we made allusion to the many experiental processes that have from time to time been published; t sufficient has perhaps been said to show, by the light of e practical results to which we have referred, that the quesn at the head of this article is not only not easily answered, t may be taken as casting a doubt on the assumption that a otograph in natural colours has yet been produced.

The subject has derived increased interest from recently blished "discoveries." Time and experiment alone can ow whether these "discoveries" will stand the rigid tests d scrutiny to which they must inevitably be put. We strust the financial element in connexion with these "disveries," as tending to obscure the judgment and produce ntrustworthiness of opinion. The future, however, will infillibly right matters in this respect.

Snow Prognostics.—According to Mr. G. F. Chambers, who s recently published a little book, *Story of the Weather*, certain gnostics can be made from the size of snow flakes. For instance, states, if they are large in size, or, if beginning small they crease in size, there will soon be thaw, especially if the wind southerly. Snow can never fall, according to the same authority, en the temperature is very low. When the temperature is low, t not low enough to prevent their fall, they are at their smallest, d increase in size up to 32° Fahr.

London Fogs.—"It has been remarked," says the *English echanic*, "that we have had few fogs of late years, and the jority of them have not been real fogs, but 'black clouds,' necesating the use of artificial illuminants, though the atmosphere near e surface was comparatively clear. Choking fogs of the 'peasoup' der have been rare of late years, and Londoners do not call it g now so long as the lamps can be seen on the other side of the d. The foggiest months, according to statistics, are, in order, cember, January, November, February. The average number of gy days is twenty-five. We have had nine this season, and not e a real, old-fashioned specimen." This ought to be good news for tographers, but we must confess to not having heard of any fresh ess of business in consequence.

How Artists are Classed in France.—In this country nters, sculptors, and the like generally consider themselves something more than ordinary tradesmen. Evidently they manage things differently, if not better, in France, for the Paris correspondent of one of the daily papers telegraphs that the Licences Commission has decided that painters, sculptors, engravers, and artists, who sell the products of their art, are to pay a licence duty, like any French tradesman or manufacturer. This would seem to show that in France artists and sculptors are in future to be treated as mere tradesmen or manufacturers. Is this a levelling up or a levelling down? We know many artists in this country, though they are not R.A.s, or even aspire to ever being A.R.A.s, who would feel highly indignant at being classed as either tradesmen or manufacturers, though they get their living by selling their work.

Peterborough Cathedral.—The further the pulling down of the north-west gable proceeds the greater is the proof of the Dean and Chapter's wisdom in their determination, in spite of the clamours of a certain number of antiquaries and artists, to take down what is necessary. As the work has proceeded the workmen have found that many of the stones, which had the appearance of being very massive, were only a few inches thick, and it is quite a wonder, as they say, how they have remained in position so long. From this and other facts in connexion with this building it would seem that the "jerry builder" is not of such modern creation as many imagine. However, the front is to be restored substantially, and in such a way that it will last as long as it has hitherto done. There is one fact that the restorers must bear in mind, namely, that, when their work is completed, they will have to face photographs of the front before the work was commenced, as well as endure the, doubtless, adverse criticism of a few antiquaries and artists.

The Metric System.—There still seems to be some, though at present remote, prospect of this system being adopted in this country. On Friday last, Mr. Ritchie, in reply to a query put to him in the House of Commons, said that he was unable to fix a date for the introduction of last session's Bill for the metric system of weights and measures, but he hoped that it might not be long delayed. This reply does not seem very hopeful for the speedy adoption of the system, which, sooner or later, must come. All Continental and many American photographic formulæ are given in the metric system, and they often suffer by translation into English weights and measures. The most practical method of utilising the two systems is to have one's fluid measures graduated, on one side according to the English system, and on the other according to the metric one. With regard to the weights, supposing them to be the ordinary gramme weights, it suffices to stamp upon them their value in English grains; then one set of weights and measures will do for both systems, and no calculations will be necessary.

Cheap Electricity.—It is stated that the St. Pancras Vestry have come to an understanding with a new company which is about to put motor cars on the streets. They are to have the electricity at twopence per unit. There is no doubt that this will be considered a grievance by photographic and other consumers paying a larger price, unless, indeed, which is not likely, they are to be put on the same terms. Under the Act of 1882, such preferential rates are illegal; but, as there is no practical method of obtaining penalties against infringers, the prohibition is virtually a dead letter. Possibly an injunction might be obtained, but the game would not be worth the candle. In connexion with the subject of electrical lighting, it is interesting to learn, on the authority of a recent report to the State Department of the United States, that the charcoal, of which the filaments are made, is the most expensive product in the world. It is said that some of the filaments are so light that nearly a million and a half would be needed to weigh a pound. The cost per pound is put down at 12,000 dollars, or, say, 2400 pounds sterling.

The History of the Röntgen Rays.—This history would appear to be like the manners of certain aboriginal races of whom it is reported that, when a raw diplomat was sent to report upon the manners and customs thereof, he wrote: "As

to their customs, they are beastly; as to manners, they have none." Professor Thompson, in a recent lecture before the Royal Institution, said: "So much that is misleading has been written concerning the now-famous Röntgen rays" that he commenced "by clearing the air." He said: "So many fabulous stories have been circulated, principally in photographic journals, and other papers written by unscientific people (clearly not referring to THE BRITISH JOURNAL OF PHOTOGRAPHY), that he thought it worth while to read Röntgen's own account of what occurred, as given to a student of physics last year in his own laboratory. From this it appeared there was really no history to the discovery. "There was no New Photography. It was the old photography of dry plates. That which was new was the light." Knowing as much as our readers do on this subject, they can draw their own conclusions as to how far Professor Thompson has substantiated his statement.

Daguerreotype Negatives!!—One of our contemporaries, in an editorial paragraph last week, says, and says it too in all seriousness and without comment: "At a meeting of the Ealing Society, Mr. Whiting handed round a number of old prints on plain salted paper, taken by negatives made by the daguerreotype process by Mr. Ruskin, the celebrated art critic." Negatives made by the Daguerreotype process! Great Scot! Had prints from "daguerreotype" negatives—mark the spelling—been shown at the Brondesbury Society by Dr. Burton Coxe, of hydroxyl-mono-hydride fame, we should have surmised that the learned Doctor, with his hydroxyl, had perhaps discovered some means of rendering the silvered copper plate transparent, so that it could be printed from.

BUT, joking aside, as we have said on former occasions, it is to be regretted that modern writers should put into print about the old processes, of which they know nothing, that which, if perpetuated, will be misleading to future generations of photographers. There are even now hundreds—nay, thousands—of the present generation who know nothing of Daguerreotype that, if they read the paragraph in question, would naturally conclude that negatives could be made by the Daguerreotype process. How often have modern writers on photography, for example, confounded the old combined toning and fixing bath with the Sel-d'-or method of toning, or treated the calotype as being the same as the waxed-paper process, &c.?

Beautiful Electrical Photographs.—Mr. J. Brown, writing to *Nature* from Belfast, describes how, by allowing sparks from an induction coil to play in various ways over photographic plates, he obtained novel effects. "Now that induction coils have become so much more widely distributed," he says, "it seems worth while to again draw attention to the exceedingly beautiful and interesting effects easily produced in this way. A very fine set of prints from similar spark traces was exhibited by Mr. A. C. Swinton at the Royal Society's *Conversazione* of June 15, 1892." It will be understood that no intervention of a Crookes' tube is required. All that is necessary is to let the sparks from the separated wire terminals of the coil play across the plate in various directions.

Electrical Images.—The letter calling forth Mr. Brown's was a very remarkable one by Mr. L'Anson in a previous number of *Nature*, who wrote that he had secured "very perfect images of the invisible electric discharge without the plates being exposed to either X rays or light. This discharge—or, possibly, more strictly speaking, the electrified streams of air driven off by it—appears to act upon the plate exactly as light does. It is thus possible to secure impressions of such discharges by simple electrification and subsequent development. Under certain conditions, very perfect images of the relief upon coins and similar objects can be obtained. This seems to account for the fact that in some cases radiographs of coins have shown some trace of designs upon the under side, which was in contact with the film." He sends prints, which are reproduced in *Nature* (vol. lv. No. 1421, p. 270), showing impressions of the head and inscription which clearly arise from no other cau though the letters of the inscription are mostly represented irregularly shaped marks. The coins "were laid upon a phot graphic dry plate, enclosed in a cardboard box, electrified for tw seconds from one pole of a small induction coil, and develope The images are surrounded by a brush-like discharge.

Prosecution for Misuse of the Royal Arms. On a former occasion we called attention to the fact that son photographers were illegally using the Royal Arms, though qui innocently, not thinking they were doing any wrong. It seems be a very common impression that, if any one supplies any article the order of the Queen, they are entitled to put up the Royal Arm and use them on their circulars, billheads, &c. That is a great mi take, and they render themselves liable to a penalty of 20*l.* by doing. Last week a butcher at the West-end was proceeded again at the Marylebone Police-court by the Incorporated Association Her Majesty's Warrant-holders, Limited, for using the Royal Arr without authority. The defendant was fined 15*l.*, with 5 guine costs. The case was this—and it is on all fours with similar ones, which photographers surmise they have the right to use the arn —the defendants received an order to supply a joint of beef from beast bred at the Windsor Royal Farm, which he had purchase and from this he assumed he was entitled to do as he had don Further, he contended that, as he had taken out a patent for an i provement in suspending carcases of meat, he was, on that accou entitled to the use of the Royal Arms; but this did not avail.

THE Incorporated Association of Her Majesty's Warrant-holde is a body of tradespeople who are entitled to use the Royal Arn banded together to protect the interests of those traders who a properly authorised to use the Royal Arms. It has, by advertis ment, from time to time, cautioned traders against the illegal use the Arms, and threatened prosecution. We believe it is the custo of the Association to always write, requesting a discontinuance use of the Royal Arms, before commencing proceedings, and, if th is complied with, there is an end to the matter, so that it cannot considered an arbitrary Association. We give prominence to th case because, as we have just said, some photographers are using t Royal Arms, on the strength of their having supplied photograp to the Queen, innocently surmising they have a right to do so.

THE METHOD OF TESTING A DEVELOPER.

I.

IN the current issue of the *Bulletin de la Société Française de Ph graphie* there is an important paper by M. le Capitaine Houda from which we make the following extracts. It will be noted t in the main it bears out the contention of Mr. Alfred Watkins as the relation between the appearance of the image and the durat of the development.

Captain Houdaille points out that it is sufficient to open any wo on photography or any journal to be struck with the multiplicity developing formulæ; these are generally tried by amateurs and fou no worse and no better than what they have used before, and fina they go back to pyrogallol or hydroquinone, the choice betwe these two developers being a matter of temperament and characte

For certain amateurs the pleasure of photography lies in t development of a negative, and amongst this class are to be found t most adherents of pyrogallol; others, again, and they are legion, o look upon development as a tiresome job, which is unavoidable if o wants to obtain a print, and they therefore prefer an automa developer.

Captain Houdaille's studies have been specially undertaken this second class of amateurs, and a hydroquinone formula has be used; but the method is applicable to every developer.

There are six general considerations:—

(*a*) Scale of tints in a subject, in the negative and the positive.
(*b*) The qualities required in a developer.
(*c*) The necessary operations to apply the method.
(*d*) Study of the law of the appearance of the image. Energy.

(*e*) Study of the law of the increase of the opacity. Concentrated · dilute developer.

(*f*) Influence of the duration of exposure.

The whole art of photography may be summed up in a few lines, ıus :—

Given a scale of tints, produce a negative which will permit one to ›produce a similar scale in a positive.

For the human eye the scale of tints in a subject depends upon the ıminous intensity of each object combined with the sensation of ɔlour.

For the photographic objective the sensation of colour disappears, ıd the actinic intensity alone comes into play.

If we take as a particular example a landscape which consists of a 'hitewashed wall in sunlight, the luminosity of this in sunlight will e 48, in the shade it will be 8, and objects in shadow will be 1.

A scale of luminosities, then, ranging from 1 to 48, appears ɔ be sufficient to represent the majority of objects to be repro-uced. In portraiture in the studio this scale is reduced to 1 to 25, r 1 to 16.

In the negative the scale of tints is represented by the opacity of ıe deposit of silver. It is usual to speak of the opacity as equal to , 10, 20 when the film transmits $\frac{1}{5}$, $\frac{1}{0}$, ^{1} of the light which it eceives. The absolute opacity thus defined is not of much value, ut the value of the print depends solely on the ratio of the different pacities. It would seem preferable, therefore, to take as the unit f opacity the clearest tint of the negative. In most negatives this ale of tints may be represented by 1 to 15, or 1 to 20; for very igorous negatives it may range from 1 to 40. It will thus be seen ıat the scale of tints in the negative is, as a rule, less rich than the ıminosity scale of the subject photographed; it is, therefore, of ıterest to find a developer which will increase this scale as much as ossible.

In paper prints the scale is represented by a series of tints vary-ng from white to black, or red-brown, these tints being dependent n the duration of exposure, and varying with the nature of the aper used.

With Lumière's citrate of silver paper one minute is sufficient in iffused light to obtain a distinct trace. Twelve minutes are re-uired to produce a black tone, and twenty-five minutes to arrive at uniform black.

The scale of tints with this paper, then, may be represented by he numbers 1 to 25. If the duration of insolation is longer than his, the eye is incapable of detecting any difference.

With Lumière's A bromide paper, developed with amidol, this cale is more extended, and, representing by 1 the exposure which will ive a visible impression, 30 will correspond to a black tone, and 50 o a uniform black. These two papers are taken as types, each of vhich has its advantages and disadvantages.

The citrate paper enables one to utilise weak negatives, the naximum opacity of which is comprised between 10 and 25, but it s incapable of reproducing all the shades of a negative rich in tones. With bromide paper, ordinary negatives give grey and flat prints; ut, on the other hand, with a vigorous harmonious negative, the rints are full of half-tone.

The considerations which we have laid down on the subject of a cale of tints enable us to define the ideal developer.

It is that which will reproduce the scale of the luminous intensi-ies by a scale of opacities of the same value. This developer should lay the curious *rôle* of furnishing indefinitely a series of *clichés* and ontretypes absolutely identical one with the other. We must point ut that this developer does not exist, or, at least, we have not met with it.

According to the result which one wishes to obtain, one ought to e able to increase or decrease the extension of the scale of opacity. There are, however, certain limits beyond which it is not permissible o go if the negative is to give a proper print.

1. The developer ought to allow one to obtain a scale of opacity varying at least from 1 to 12, and, if possible, from 1 to 25, if the negative is to be used for the majority of the commercial papers.

2. If it is desired to reproduce a subject exactly, a developer as nearly as possible as ideal should be employed.

3. The different effects of increasing or diminishing the contrasts ought to be possible of attainment by a modification as simple as possible of the formula.

4. The duration of development ought to be less than eight minutes in order to avoid yellowing of the negative, and more than three minutes in order to allow the appearance of the image to be easily followed.

BY THE WAY.

Of course, *the* topic of the day, I will not say in the studios, but at the meetings, in the street, and in the journals, is the election of the Royal Photographic Society, though, as far as I can see, not, of course, being behind the scenes on the opposition side, opinion seems to be all against the party of so-called reform. And here, by the way, as a comparative outsider, I should like to ask who constitute this great reforming party? Looking at the list of members proposed for official honours, as well as their proposers, I see a number of names that are perfectly unfamiliar to me, and many more that I only know through seeing them in the reports of the minor metropolitan societies. Even in the "forecast" list, published in last week's issue, although I am personally acquainted with the majority, there are names that are quite new to me, and others that I personally should not vote for, and I dare say a large proportion of the country members of the Society are even worse off in that respect than myself.

In speaking of unknown members, of course I know they may be, and possibly are, very much known in the immediate circles in which they move, hence their appearance on the scene. But why should I, or any other member, be asked to vote for an individual I or they do not know, simply because a few of his friends choose to put him up as a "new-blood" member? There was a similar agitation to the present one outside the Council some years ago, and some of the malcontents of that day have since secured seats, but, as far as I can see, are not yet satisfied, but still pursue the policy of friction. Would it not be well, at the first opportunity, to so alter the laws of the Society that no President or Vice-President can hold office for more than one year, then perhaps the discontented ones would have a nearer prospect of attaining their ambition?

Seriously, there ought to be some committee of selection, before whom the names of proposed candidates should pass before being put upon the voting papers, and, if I mistake not, some such process was formerly gone through, though I believe then the revision of the candidature list was in the hands of the Council itself, which is not a desirable plan. But, at least, a sub-committee, independent of the Council, might be elected each year to examine into the list of candidates put forward, and to pass only those whose claims appear to be *bonâ fide*. The committee could consist of members of all shades of "politics," and it would offer the advantage that all the fighting about "new blood" and kindred subjects could be carried on by the more vigorous members of the respective parties in the semi-privacy of the committee-room instead of in public, and without interfering with the ordinary business of the Society.

But I am personally of opinion that the absolutely best way of settling the elections would be to "trot out" the whole of the candidates before a full meeting of the Society, if it were possible to get such, and to leave the members to make their selections from the samples before them.

I do not know whether much advantage has been generally taken of the recent opportunities for winter photography; but, in a part of the country where I have been, I do not remember to have seen better chances of snow scenes—as distinguished from frost scenes—in the whole course of my photographic experience. In the case of frost scenes, the effects are too frequently evanescent, the hoar and rime being accompanied by an amount of mist or frozen fog that entirely precludes the possibility of exposure, and disappearing entirely the instant the sun clears away the obstructing fog; but,

with snow scenes, under favourable circumstances, the case is very different. Although, as a rule, an open landscape covered with snow does not, pretty though it may look, offer the best opportunities for pictorial rendering, at any rate by photography, still, where the conditions are favourable, I think even better pictures can be made with snow than with frost.

For instance, I have before me a print from a negative taken a week or two ago, the foreground of which is broken up with shrubs and flower-beds, all snow-clad; the middle distance consists of evergreen trees, such as cedar, arbor vitæ, yew, *et hoc genus omne*, heavily laden also with snow, and affording a glimpse of open landscape in the distance just visible through an apparent mist or fog. The whole is rendered in the most delicate gradation, without a symptom of the patchiness so usual with large masses of snow, and the atmosphere is as apparently perfect as if the picture had been taken under the most favourable summer conditions. I say apparently perfect, because, although as a picture the photograph is a success, it is not an accurate rendering of the scene as it appeared to the eye, and further than this the negative, when developed, was thrown on one side *as a failure*.

As a matter of fact, at the time the picture was taken the atmosphere was perfectly still and clear, so still that, in spite of the mass of snow about and the great flood of light, an exposure of a couple of seconds was given. The long exposure gave softness in the foreground objects, but the distance, which to the eye was perfectly clear, was over-exposed or "halated" to such an extent as to appear fogged. The result was that the friend who developed the picture, and who is one of those who love a "pretty" negative, cast it aside as of no account, and scorned the idea when I suggested it to him of wasting a piece of paper in trying a print. He was correspondingly surprised when the result appeared as I have stated—a really lovely picture, though not exactly true to nature. But what matter?

It seems to me not at all improbable that many *pictures*, not only of snow, but of other subjects as well, are annually lost through the inability of the artist to recognise the character of the negative at sight. In the ordinary rendering of landscape subjects we are all prone to look more or less for pretty negatives, that is to say, for negatives that are as clear and bright as possibly may be without loss of delicacy of gradation; and we do not like to see anything that looks like veil or fog. But I remember the *dictum* of an old master of landscape work in the early collodion days, namely, that "the best prints often come from the worst-looking negatives." Messrs. Hurter & Driffield define a perfect negative as one that will give the best print in the shortest time; all very well as far as it goes, like other of those gentlemen's conclusions. But never mind the shortness of time if the result is attained in the end from a veiled negative.

A similar instance to the snow negative of my friend, though under entirely different circumstances, strikes me as being on record. Many readers of the JOURNAL will remember a picture exhibited at Pall Mall twelve or fifteen years ago—*A Misty Morning on the Wear*—a distant view of Durham Cathedral, seen through a veil of mist. As a matter of fact, this negative was taken in the glare of midday sunshine, and, like my friend's snow picture, cast aside as a failure; but subsequently its pictorial qualities were recognised, and it lived to take a medal at Pall Mall, and to be one of the pictures of that year's Exhibition.

Sir Henry Trueman Wood's description of M. Chassagne's new colour process strikes me in an almost familiar form, for it *is* the first published step in the direction of the fulfilment of an imaginary process of many years ago. It must be thirty years ago now, or in the early days of photo-lithography, I was looking over with an old friend some of Bullock Bros.' photo-lithographs. My friend, long since gone to the majority, was one of the early waxed-paper men, attracted to photography from sheer love of anything scientific, and dabbled in a lot of different branches of science. "Ah," he said, "wait till I perfect my photo-chromo-litho process!" Then he sketched out a process in which a sensitive surface was exposed to light, by which it was impressed with a selective colour sensation. It was afterwards rolled up with an ink which, if applied to an ordinary litho stone, would give a monochromatic picture; but, when applied to the specially prepared transfer, the latter, by virtue of its selective power, produced a coloured image by attracting the corresponding constituents of the ink to those portions where the colour sensation had been impressed by light. "But how are you going to do this?" I asked. "Ah, there's the rub!" was the reply. And then I knew it was but a dream. DOGBERRY.

CHASSAGNE'S COLOUR PROCESS.

[Nature.]

THE process of colour photography, which I had the pleasure of seeing demonstrated at King's College some ten days ago, through the kindness of Sir H. T. Wood, is a very remarkable one. I went as a sceptic. The process may be described in a very few lines. In the first place a negative is taken on a gelatine plate, which has been specially prepared. The plate is developed and fixed in the ordinary way, and the image appears of the same character as if taken on a good density-giving plate. A transparency (a positive) is next taken on a similar plate from this negative, or a silver print made on specially prepared albumenised paper, on either of which the colour process is worked. The colouring is of a very simple nature. There are three dyes—a crimson-red, a grass-green, and a very good blue, all in solution, and mixed with some other ingredients besides water. There is also what we may call a mordant in the shape of a colourless liquid containing, I should say, albumen and salt.

This last liquid is brushed copiously over the face of the positive (or the silver print), and the blue dye applied a little at a time. If the light be good (and it was stated that the colouring must take place in good daylight), the blue dye rapidly takes hold of those portions of the surface which represent in monochrome what are blues in the original. For instance, a china vase will take the blue tint, and the face or hands a faint amount of the same colour. The green dye is applied in the same manner, and the greens in the original make their appearance in the positive, and so with the red. Finally the print or positive presents a picture in colours, underlying which is the dark brown silver image. It appears as if the image took up selectively these three colours; but why it takes them up it is hard to see. I have by me a portrait done in the manner described, and the negative has evidently been retouched with the pencil. It is difficult to understand why a pencil mark should be the cause of selective absorption of the colours, or that a special plate should be necessary. That the success of the process does not depend upon the inventor's manipulation is quite evident, for negatives were taken by Sir H. T. Wood, quite independently of him, but, of course, on prepared plates given him for the purpose, and from these he made positives. These last, when treated with the colouring matter, gave the correct colours of the original. Still I am somewhat sceptical—I believe it is my failing to be so—and I shall not be satisfied till I get the plates that have been promised me by the inventor (M. Chassagne), and taken negatives of certain test objects which will be unknown to the inventor. If he can reproduce their colours, it will have to be without any reference to the amounts of silver which ordinarily indicate the colour in the original, for in the negatives sent every colour will be represented by approximately an equal density. Some few years ago a powder process was seen by Mr. C. V. Boys, in which three coloured powders selectively adhered to the surface of paper. The paper was prepared with some glutinous substance and bichromate of potash, and which remained more or less tacky according to the amount of exposure to light it received. These three powders, a red, a green, and a blue, I believe, if applied in a certain order, adhered to the print, and gave approximately correct results of colour, though no special negative was required. Whether this new process now described depends on any similar grounds, it is hard to say at present.

The point that strikes me in the latest process is that it is only from a specially prepared negative that a print suitable for colouring can be made. Were it the negative which took up the colour, one might understand the matter better. To me at present the process as stated is a mystery; but, if it does all that it is claimed for it, it

must be a great success, and the theory of it will have to be investigated in a thoroughly scientific manner. At present the details are a secret; but I am given to understand that the seal of secrecy will be withdrawn before long, as a patent is applied for. We shall then be able to ascertain on what principles the process is worked.

CAPTAIN W. DE W. ABNEY.

FOREIGN NEWS AND NOTES.

Photo Reliefs.—Schmidt suggests the following method for making reliefs by photography: A sheet of glass is coated with bichromated gelatine, which is prepared by allowing fifty parts of gelatine to swell for some hours in water, melting and adding two parts of potassium bichromate dissolved in forty-eight parts of water. The bichromate should be added by lamp light, the gelatine solution being constantly stirred and kept warm meanwhile. The glass should be carefully levelled and warmed, and the gelatine should be poured into the middle of the plate, using a glass rod for it to run down to avoid air bubbles, and the rod may be used to distribute the gelatine if necessary. As much solution as possible should be poured on the glass without allowing it to run over the edge, and, when set, it should be dried in a warm place free from dust, and used as soon as dry, as it will not keep long. It should be printed under the negative until an equally dense negative gives a fully printed-out image on collodio-chloride paper. It is advisable to use direct sunlight, and allow the rays to fall on it as nearly as possible at right angles to the negative, as this ensures greater sharpness. The plate should, after exposure, be well washed in cold water till full relief is obtained, and then placed on one side till surface-dry, and then brushed over with a soft brush with linseed oil, and then a thin cream of plaster of Paris poured on to it and allowed to set. The relief may be readily stripped from the gelatine, and may, of course, be used as a mould for electrolytic deposition of metals.

Death of M. Berthiot.—The death of M. C. Berthiot, the eminent optician of Paris, is announced. Migrating to Paris at an early age, he completed his studies, and then entered the business of an optician. In 1870 he took out a patent for casket lenses of variable focus, and in 1888 produced periscopic lenses of extremely wide angle, and was one of the first to use the Jena glass in France. To him also belongs the honour of having suggested and patented the use of coloured screens with parallel faces; but, as this was in 1875, when orthochromatic plates were little used, his suggestion was not taken much notice of.

Insoluble Carbon Tissue.—Kastner states that carbon tissue which has become insoluble on the surface may be rendered fit for use by floating the paper films downwards on hot water, by which means the insoluble film floats off, and the tissue should be immediately immersed in cold water, and squeegeed down to glass or ferrotype, again sensitised and dried. He states that this gives absolutely pure whites, and the small quantity of film removed has no effect on the intensity of the image.

THE STIGMATIC LENS IN USE.

Read before the London and Provincial Photographic Association.]

WHEN, by the publication of the discoveries of Daguerre and Fox Talbot, photography became a practicable art, Professor Joseph Petzval devoted his energies to the construction of a lens which should be capable of covering a fairly wide angle of view, and be so free from spherical aberration as to yield fine definition, whilst admitting a volume of light sufficient to give rapidity. The resulting Petzval lens—the ordinary portrait lens—has always, and rightly, been considered as a triumph of mathematical optics. So perfect was it, that it remains in use to the present day in most portrait studios. In comparing, therefore, as I have done, the work of the new "stigmatic" lens with that of a first-rate example of the Petzval lens (by Voigtlander), it is evident that, if the latter suffers materially by the comparison, the construction of the new instrument must be regarded as a very important advance in photographic optics.

The weak points in the Petzval lens—inevitable perhaps whilst the supply of glass was limited to that which was obtainable at the time of its production—which, it has long been felt, left a good deal to be desired, are, a want of flatness of field, and the existence of an amount of astigmatism which causes the definition to fall away rapidly as soon as the centre of the field is left. Either of these defects may be to some extent remedied by tolerating an increase of the other, and compromises, leaning more to this or that side, were arranged by different manufacturers. A third disadvantage is the unequal illumination of the field, the margins being much less lighted than the centre. In all these respects, the stigmatic lens shows a very marked improvement upon the older form.

In order to make a comparison of the work of the instruments, a column of type about three feet long was affixed to a board. At intervals of three inches along the column, small pieces of white paper, each bearing a number, and a cross with vertical and horizontal lines, were pasted down. The board was set up with one end opposite to the centre of the field of the lens, and means were taken to ensure that the board should be at a right angle to the axis of the lens, and consequently that the camera back should be parallel with the printed matter. The plate-holder was arranged so that a strip half an inch wide and six inches in length could be exposed, and, by shifting the plate, half a dozen exposures could be made side by side, thus facilitating the comparison. A special camera front was so fitted as to bring the lens opposite to a point on a half-plate, which point was situated at a distance of one inch from the end. The image was photographed one-sixth of the size of the original; and, as it appears as far at the No. 10, and each three-inch division of the original occupies half an inch on the plate, the tenth division is at a distance of five inches from the centre of the field, and represents what is included in a circle of ten inches diameter on the focussing screen.

The lenses tried were of about eleven and a half inches focus, and the results are as follows: In the Petzval lens, with aperture equal to No. 1, U.S., the definition is very fine at the centre; but at half an inch from the centre there is already some falling off, and at a second cross, one inch from the centre, only the large capital at the beginning of the advertisement can be read. With the stigmatic lens, the same degree of legibility extends to cross No. 5, or a distance of two and a half inches from the centre. This distance, two and a half inches, from the centre of the field of the lens and of the plate is about as far as the head or feet of a full-length cabinet portrait come; and, as a lens of the focus of those tried is commonly used for portraits of that size, it is a position of importance. Compared with the definition of the stigmatic lens, an open aperture at this angle, the Petzval with No. 4 stop (=*f*-8), is distinctly inferior.

Continuing the examination of the image of the Petzval lens, we find that almost all trace of the form of the cross is lost in the fourth division of the strip, with aperture No. 1; between the fifth and sixth divisions, with aperture No. 2; and, at the seventh division, with aperture No. 4. With the stigmatic lens there is rather more distinctness than this with the No. 1 (open) aperture as far as the eighth division, whilst, with No. 4 aperture, the form of the cross is not entirely lost as far as the image extends, or up to No. 10, which represents the circle of ten inches diameter, or about 45°, a much larger angle than is used with portraits, when the position of the head, and not the corner of the plate, is the point considered.

It must be remembered that these examples are taken from a flat surface, and that an arrangement of objects to suit the curve of field of either instrument would show somewhat different results, but the flat field is that which is generally useful. Certainly it is for portraiture in the ordinary way.

The advantages, so far, found in the images yielded by the stigmatic lens arise partly from its freedom from astigmatism, and partly from its flatness of field. The evil arising from curvature may be, to some extent, remedied in the case of groups by bringing the side figures forward, but such a practice is to be avoided, if for no other reason than that it suggests at once the limitation by which the photographer has been bound, and the artifice that has been employed to disguise the fault. A small stop, when practicable, will very much get over the difficulty; but, of course, if one lens will give a result with a large aperture, which another instrument, otherwise of a like character, will only give with a smaller opening, the former is the preferable instrument.

Curvature of field was measured by focussing the cross at each interval of half an inch on the screen, measuring the amount that the lens had to be turned in, and plotting the curve from these measures. It was found that the curvature of field of the stigmatic was rather less than half that of the Petzval. That is to say, that, for a spot at a given distance from the centre of the field, the Petzval would have to be racked in twice as much as the stigmatic, to bring the details into focus.

The greater equality of illumination in the stigmatic lens, which

is very evident on inspection of the exposed slips, is partly due to the nearer setting of the lenses, and partly to the fact that, with this instrument, rays, whether central or marginal, pass through surfaces to which they are nearly normal. With regard to the former condition, it is obvious that, if a lens, consisting of two components at the ends of a tube with no fixed diaphragm, be looked through otherwise than centrally, portions only of each lens come into play, and one edge of the lens at the front of the tube, and the other edge at the opposite end, are cut out of use, and this more and more as the instrument is held more obliquely; consequently it is only at about the centre that we get the full power of the light, and the margins suffer.

To come to a practical illustration, which will be easily understood; a full-length figure was photographed of the ordinary cabinet size, in the one case with the Petzval and No. 2 stop, and in the other with the stigmatic open. In the former the feet are not so well defined as in the latter, the face being focussed in both instances. I have never, till now, been able to get what I consider satisfactory definition in a full-length cabinet with a larger than No. 2 stop, and have generally employed No. 4. With our rapid plates, the use of such a stop may in most cases be not objected to; but there are cases, such as portraits of young children, flashlight work, &c., when all the rapidity that can be obtained is desirable. Another very important case is, when groups are concerned, to avoid the mechanical crescent arrangement, which has been before mentioned.

If there is any feeling of regret in connexion with the stigmatic lens, it is in the idea that the Petzval or portrait lens, which has been the admiration of scientific opticians, and the instrument which has been of such immense service to photographers for the last half century, should at last be surpassed, if not doomed.

W. E. Debenham.

THE PHOTOGRAPHIC OBSERVATION OF CLOUDS.

[Nature.]

It is a commonplace to say that the phenomena that present themselves most frequently are also those that are least observed with accuracy and intelligence. The ever-changing aspect of our sky, and the screen of vapour covering that adds charm to landscape and variety to scenery, present numberless opportunities, says *Nature*, for study and critical examination, but they have long waited for adequate description and representation. It was not till the beginning of this century that any special nomenclature was invented to describe the alterations that take place from hour to hour, and the very slight additions that have been made to this special vocabulary since Luke Howard proposed the three well-known terms of description, show the neglect from which this department of meteorology has suffered. These terms, too, though they have become the common property of all nations, are limited to description, and suggest nothing of the physical causes that determine the appearances he so happily described. Indeed, meteorology in his day was not in a position to push the inquiry with hope of success, and it may even still be urged that the explanations offered to account for some of the recognised types of cloud formation are largely speculative. The neglect of a very charming study has been brought about, not only by the fact that clouds are of ordinary, every-day occurrence, and therefore not worth noting, but students of practical meteorology have perhaps too much considered that barometer and thermometer readings are the one thing needful, and have looked to the preparation of a weather chart as a veritable sheet anchor to maintain and support the position of the science, for hitherto the general character of cloud observation among even painstaking meteorologists has been lamentably insufficient. A rough personal estimate of the percentage of area covered by cloud is frequently all that is given, with very little reference to the distance from the zenith at which these clouds are seen, and consequently neglecting the effects of foreshortening. Altitude, density, direction of motion, character of formation, have all been regarded as of small consequence, but it is to be hoped that an epoch of more useful and more exact observation is dawning, and possibly we may run into the other extreme, now that attention is being called to the subject, and devote too much time to the consideration of these fleeting appearances, and accumulate more results than can be effectively studied.

It might have been anticipated that artists, who maintain so constantly that they reproduce precisely what they see, would have given us pictures of clouds in some degree approaching to accuracy, and have made the discussion of their forms and characteristics easier for men of science. But, as a rule, the study of these specialists has scarcely been more exact or painstaking than that of the ordinary public, who, from the causes hinted at, are especially unfitted to apply that wholesome criticism which might have resulted in promoting more accurate representation. We believe there is a case on record in which a painter represented a rainbow with the colours reversed. This was unwise, because, a rainbow being a rarer phenomenon than ordinary clouds, it has attracted more attention from the public, and the error was noticed. But faults as egregious too often accompany artistic production of clouds, and pass without censure or remark. Painters may make rain fall from a thin strip of cloud, or from impossible cumulus, and escape without ridicule. But these are freaks it is no longer safe to indulge in.

The artist, too, who paints by sunlight, and without the aid of brushes and colours, is often as glaringly incorrect as his more respected and ambitious brother. We have heard in the past, we know not with what truth, of artfully placed pieces of cotton-wool on the printing frame, and of other devices which, by judicious handling, have been made to give an appearance remotely resembling that of natural clouds, and that competent judges have been deceived by these means. A great authority on photographic reproduction has laid it down as a rule that the same "sky" should not be printed on more than one picture; and that such advice should be considered necessary shows the length to which ingenious fraud has been carried in this matter. And yet it might be thought that, if accurate reproduction of cloud forms was attempted anywhere, it would be found in photographs of landscape. Some of the reasons for its non-appearance, very well known to practical photographers, have recently been discussed in *Nature* (No. 1367), and valuable suggestions made to overcome these difficulties. The photographer does not always wish to reproduce the actual state of the sky at the time his photograph was taken. He thinks he can produce a better artistic effect by employing clouds of his own manufacture; but, apart from this, there is an inherent difficulty in obtaining a satisfactory negative of the lighter forms of cirrus and cirro-cumulus. The blue colour of the sky has practically the same chemical action on the sensitised plate as that exercised by the white colour of these fleecy clouds, and the contrast on which the photographer relies for his effects is wanting. The rules of procedure there given have resulted in some excellent representations, of which specimens will be found in the recently issued *International Cloud Atlas*, a work that may possibly revolutionise our methods of cloud observation.

Although the processes of photography have been sadly abused, it is, undoubtedly, to the employment of the camera, scientifically used, that we must look for the best results. Every day sees these results accumulating, and, as a necessary consequence, the introduction of greater uniformity in the classification and nomenclature of cloud observations; also, greater and more frequent use suggests numerous devices to the expert, by which he may win more trustworthy pictures of the lighter forms.

It is now possible to reproduce very light cirro-cumulus clouds, and, though some of the delicacy of the original may be lost in the method of printing, sufficient detail remains to enable one to judge of the success that attends the processes that Prof. Riggenbach, of Basle, and others have successfully advocated. Prof. Riggenbach avails himself of the fact that, while the light from a cloud is only slightly polarised, the light from the blue sky is much more so, especially at points which are 90° from the sky. By employing a Nicol prism, therefore, the skylight may be darkened to a very considerable extent, while the fleecy filaments of the cloud will come out with greater sharpness and distinctness. A dark mirror may be employed instead of the Nicol prism, and a still simpler means is to use the still surface of a lake as a polarising mirror. When clouds have an altitude of about 37°, and differ in azimuth from the sun by about 90°, they can be photographed in this way with ease and truthfulness. Another method which secures admirable results, though it may not be at the disposal of every one, is to photograph the clouds directly, at a considerable elevation above the sea level. Here, on the top of a mountain summit, the sky appears much darker than in the plain, caused probably by the absence of scattered light from dust particles, which are more numerous in the lower strata. The observer, too, has the additional advantage of lessening the distance between himself and the cloud photographed.

But it must not for a moment be supposed that the object sought is to secure pretty pictures, or even accurate pictures. In clouds we have portions of the atmosphere which, from natural causes, have become temporarily visible, and, as clouds exist at practically all heights above the surface, their study must reveal to us something of the behaviour of the atmosphere at otherwise inaccessible points. Wind and currents of the atmosphere, to say nothing of the vertical displacement of large masses of the air, must betray themselves by the motion of the clouds, if the cloud movements are interpreted correctly; and the connexion between wind and "weather" is so intimate, that the possibility of predicting the one depends in a large measure upon our knowledge of the other. The definite knowledge of the height of a cloud, and the means of accurately determining its distance becomes, therefore, a problem of the highest importance in meteorology, and it is one in which, fortunately, photography can render efficient assistance. If two simultaneous instantaneous photographs of the same cloud be secured at stations, distant possibly half a mile apart from each other, the height of the cloud can be determined by trigonometry. This process has been carried out systematically at various observatories. Two observers, a suitable distance apart, and in connexion with each other by telephone, select a cloud by arrangement to which each points a camera, and the simultaneous exposure is effected by one of the operators releasing the shutters of both cameras at the same instant. Considerable impetus has been given to inquiries of this nature, not only by the possibility of greater accuracy being secured to the photographs when improved methods have been employed, but by the action of the International Meteorological Congress,

ho, mainly at the instance of M. Hildebrandsson, have arranged a heme by which observers in all countries are invited to take part in a mmon investigation, which has for its aim the determination of the ltitudes and the motions of different kinds of cloud. Theodolites can lso be used advantageously in this work. This scheme, which was riginally contemplated to be in force for one year from May, 1896, will on be completed, and will add materially to our knowledge of the mo- ons of the clouds, and, by inference, of the motion of the atmosphere. he observation of the behaviour of a kite, when at a considerable eleva- on it plays in some measure the part of a cloud, can be made, in skilful nds, to reveal the direction of atmospheric currents at generally inac- essible heights. This method, which is being actively prosecuted under he auspices of the Weather Meteorological Bureau of America, has the dvantage that the height of the kite is always approximately known, nd is free from eddies and currents likely to be produced by irregularities n the earth's surface. Moreover, if the object of cloud observation be ot so much the methods of formation as the study of air currents, kite- ying is likely to afford on some grounds more accurate information, ecause a cloud produced under peculiar circumstances, such as a moun- ain-cloud cap, for example, may appear stationary under even a strong urrent of wind.

As an instance of another welcome result that attends cloud photo- raphy, we might refer to the confirmation it affords of recent mathemati- al investigation concerning the origin of cloud. Herr von Helmholtz as demonstrated that, when one current of air passes over another of ifferent density or different temperature, waves must arise at the two urfaces in contact, similar to those produced on water under the action f wind. These atmospheric waves are, however, of quite different imensions to the ordinary water wave. The distance between two con- guous crests in the atmosphere is incomparably larger than the similar ave-length in water, and, indeed, may be reckoned in kilometres. Air aves become visible when sufficient moisture is present, and the wave rests can be seen in the form of clouds presenting the appearance of arallel billows, and for which the name of "Wogen Wolken" has been uggested. In this form they have been repeatedly photographed. A ell-known example that has been frequently reproduced has been taken om the Lick Observatory. From other elevated stations, where the onditions have been favourable, pictures of these nebulous waves have een secured, proving the justness of the views held by Helmholtz. A nass of allo-stratus cloud will frequently show that a subsequent stage of he process of formation has been reached. When the regular parallel illows produced between strata of air have met other currents having ifferent velocities and densities, the result is to break up the regular orm into more or less lozenge-shaped pieces, of which the appearance is ery familar, and the methods and terms of description equally numerous. o do away with these vague terms of description, and to substitute others hich may have closer reference to the physical structure, and perhaps ndicate something of the relative heights of clouds, is one result for hich we may look from the more satisfactory application of photography o cloud phenomena.

SPURRIER'S IMPROVED METHOD FOR SHOWING LANTERN SLIDES.

R. Spurrier's description of his improvements, as given in the rovisional specification, is as follows:—

"I construct specially suitable automatic magazines or a revolving ide-carrier, somewhat after the style of the sails of a windmill, for the ception of, and automatic insertion and withdrawal of, the pictures, the id magazines or revolving carrier being driven by a motor, such as a ring, weight, electricity or the like, as may be desired. The magazine carrier is conveniently placed to place the pictures in position to be ewed or shown on a transparent screen by a specially constructed tical lantern having a short-focus lens, the said screen being attached connected by stretchers, cords, or chains, so that, by merely pulling out e screen and lighting the lamp or jet and starting the motor, the pparatus is instantly ready for exhibition. To facilitate the use of the id lamp, that is oil lamp, I arrange the oil-container so that it can be wered, or the wicks (in either case the latter being enclosed in a tube or ge) raised, so that the wick is removed from contact with the oil; thereby e flame of the lamp soon consumes the oil in the wick, burns out and nsumes the charred portion of the wick, so that it is trimmed ready for lighting by again being returned to the oil. For this purpose I connect e container to the burner by means of jointed links, rack and pinion, or her suitable mechanism. I also construct a reversible catch to connect, will, the wick tube to the container, so that it, the said wick, may be wered for lighting. The whole apparatus is enclosed in a case or binet, there being an outer cover to the before-mentioned screen, which jointed thereto, the said cover being decorated with a picture or panels, form a cabinet or cupboard. The said screen and cover may be ounted as on an easel, the cover being jointed to the screen at its lower ge; I further joint upon the opposite edge of the cover two short legs, hich, when the cover is closed, I arrange to act as fastenings to keep the ver closed. For the purpose of exhibiting the pictures in the daytime, cover the space between the lens and the screen with light, impervious material, and provide a hood, connected in front, with an opening for viewing the pictures through, or the screen may be jointed at the corrrect focus (so that it may be folded away) in a dark chamber, such as a photographer's dark room, and viewed through an aperture for the purpose.

"The revolving carrier may be operated by hand, and when used automatically the magazine consists of a grooved box and another for the store; these two latter are made to work synchronously by means of a connecting rod and gear wheels driven by revolving the said carrier, which is constructed with at least two receptacles for the lantern slides, provided with pads upon which the slides may fall noiselessly, and spring catches to hold in and release the slides. Another way of arranging the two grooved boxes or magazines is to place one above and the other below the lens tube, mounted in a frame, slides, or runners. The magazine is placed upon a board or bottom, the frames, slides, or runners are provided with notches or pegs upon which a pusher rod acts each time it is actuated for changing a slide or picture, opening and closing a stop or rest for the slide while in the lantern. When there is not sufficient space to allow of the before-mentioned magazines, I adapt that form of changing set forth in my patent, number 17,022, September 11, 1893, figures 7, 8, providing lengthened changing grippers, a stop or rest as before mentioned and gripping springs in the store to hold the shown slides or plates. When these magazines are actuated automatically, the mechanism is arranged to allow a specified time for each picture to be viewed."

COMBINATION PHOTOGRAPH FRAMES AND STANDS FOR JEWELLERY AND THE LIKE: MANDER'S IMPROVEMENTS.

Mr. Richard Mander, of Birmingham, gives the following brief description of this improved frame:—

"It is well known that photographic prints are most frequently cut in an oblong form. In some cases it is necessary to view them when standing upon end, and, in others, when upon their side. This is usually accomplished by complicated and expensive mechanical arrangements. The object of this invention is to obviate these objections. My invention combines both positions by a simple arrangement at the back of the stand. A piece of the material used is cut into a right angle. The said right angle is attached by a suitable method to the back of the frame by a hinge (which latter may be made by half slitting the material itself or by metal hinges, or hinges of other material, cloth, or leather). The hinge is placed upon the slanting side of the right angle or the hypothenuse, and the perpendiculars lie edge upon edge with the sides of the frame. If, now, the hinged right angle is raised, the frame can be made to stand in an inclined plane upon either end or side of the frame, and upon either of the perpendiculars of the right angle.

"The article can be made of cardboard, metal, wood, or any material applicable to the purpose."

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Aluminium Castings.—Photogeorgos says: "I much wish to have the address of one or two places in London or Paris where I could have made aluminium castings of Edison gauge wheel (sprocket) for cinematography."

A Question of Prices.—Phog says: "Could you give me your opinion of a fair price for a lantern-slide dealer to give for fifty transparencies from quarter-plate negatives (to sell slides proceeding therefrom), both from good artistic and popular views, and just ordinary views, in every case clean negatives; also price for negative itself?"—We are unable to hazard a guess; possibly, therefore, some readers will help our correspondent.

Stained Fingers (To "Apprentice").—You ask if any readers can assist him with advice as to cleansing them. I think, if he will make a solution of iodide of potassium, and add a little tincture of iodine, and soak his fingers in this for a few minutes (especially before they have got dry and darkened in the light), a wash afterwards in weak cyanide will remove the stains easily, and not run so much risk of poisoning by absorption through the skin. Between 1860 and 1870 I worked wet collodion a good deal on 12 × 10 plates (landscape work in a tent, &c.), and you may imagine I got pretty well-stained hands; but I always found them easily cleaned by the foregoing treatment,

and without using the cyanide so strong as would be necessary on the stain direct without the soak in iodine.—AJAX.

LET "Apprentice" dip his fingers into an aqueous solution of iodine after he has been using silver solution, follow by cyanide or hypo. If he never neglects this, his hands will be free from silver stains. The iodine solution may be of almost any strength. Put a few crystals of iodine into a couple of ounces of water, and now add crystals of iodide of potassium till the former is dissolved. A solution of the colour of dark sherry is suitable and harmless.—W. T. B.

Our Editorial Table.

SOVEREIGN PORTRAITS.

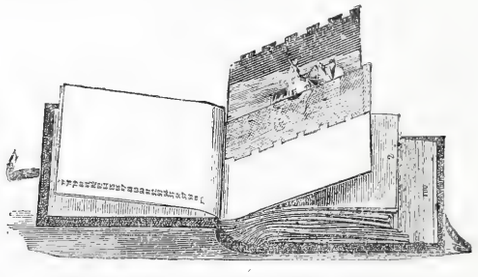
R. Flamank & Son, 62, Victoria-road, Aston Park, Birmingham.

THESE little portraits, of which Messrs. Flamank have sent us some specimens, are cut circular and are about the diameter of a sovereign, hence the distinctive name that has been given them. They are gummed ready for use, so that they may be readily attached to note headings, cards, &c. The idea is a good one, and the cheapness at which they can be sold should ensure sovereign portraits a vogue.

BECK'S FILM-STORING NEGATIVE ALBUM.

R. & J. Beck, 68, Cornhill.

MESSRS. BECK have submitted to us a sample of this handy little album, which includes within its covers a hundred numbered envelopes for holding film negatives, and a numerical index. The



space occupied is very small, and, the envelopes being made of specially thin paper, are transparent, so that it is not necessary to remove a negative from its envelope in order to identify it. Photographers who work films will appreciate this convenient storing album.

PHOTOGRAPHY AS A HOBBY.

By MATTHEW SURFACE. Bradford: Percy Lund & Co.

No. 12 of Messrs. Percy Lund & Co.'s Popular Photographic Series suggests, in plain language, how photography may be turned into a pleasant hobby, and, by the aid of several illustrations, outlines an unconventional field of work for the hobby rider. The author wisely eschews the beaten track of photographic teaching, and the little book is one which, from its nature, is likely to induce many a person on the look-out for a hobby to take up photography as such.

A NEW FLASHLIGHT FOIL.

York Schwartz, Wiesenstrasse, 24B, Hanover.

IN sending us a sample of a new flashlight preparation which he is introducing to the trade, Mr. Schwartz remarks: "When ignited, this compound delivers a very great volume of very actinic light; it is in this regard far more effective than any of those mixtures known as flashlight powders (Blitzpulver). Besides this, the manipulating of the new compound is without the slightest danger, it may be cut with knife or scissors to any required size, for friction does not ignite the compound, and a very heavy blow with an iron hammer is necessary to bring on explosion, and then even only that part explodes which has received the blow. I call the preparation 'Magnesium-flashlight foil' (*Magnesium-Blitzlicht Foil*); it is legally protected against imitation in nearly all important civilised countries. I had a German description and directions for use, but may as well state that, for use, a piece of the foil is perforated at one corner with a long pin, and fixed by the same to the wall, woodwork, &c. A perforated piece of tinplate, held by the same pin, may be used to protect the woodwork, &c., against the heat (*vide* sketch in German prospectus). For a cabinet-size portrait—rapid plate, stop *f*-12 distance from camera to foremost part of object two metres, distance from flashlight to foremost part of object two metres—a piece of foil three by three centimetres is required. The foil is ignited by a match fastened to a long piece of wire." We hope to give the foil a trial at an early date.

News and Notes.

WE are informed that the share list of the Thorton-Pickard Manufacturing Co., Limited, has been considerably over-subscribed.

ROYAL PHOTOGRAPHIC SOCIETY.—Tuesday, February 16, Photo-mechanical Meeting. *Printing of Intaglio Plates*, by Horace Wilmer.

THE business of the Illustrated Press Supply Syndicate, hitherto conducted at 158 Strand, W.C., will in future be carried on at 19, Southampton-buildings, Chancery-lane, E.C.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday, February 17, Mr. S. H. Fry will read a paper on *Some Rule-of-thumb Tests of Photographic Lenses.*

MR. R. T. WATKIN WILLIAMS has been elected to the post of Honorary Secretary of the Camera Club, the duties of which office have been carried on by Mr. Cox since the retirement of Mr. J. C. L. Knight-Bruce.

THE Leytonstone Camera Club's Second Annual Ball, with limelight effects, was held on Saturday, January 30, 1897, at the Masonic Hall, High-road, Leytonstone, and was a great success, upwards of 100 being present. The special Camera Club dance and Miss Marion Maple's skirt dance, by limelight, was most successful.

A PROPOSED POSTAL CLUB.—Mr. B. Lockyer, of 14 London-road, Newbury, writes: "A Hand and Stand Quarter-plate Postal Photographic Club is about to be started, and I shall be pleased to receive names, &c., of would-be members. Would applicants also kindly forward two specimen prints for selection, which shall be returned?"

MR. W. THORNEYCROFT, of the North Bucks Photographic Supply Stores, London-road, Newport Pagnell, writes: "I should be pleased if you will kindly intimate that I am opening stores as above. The dark room is free to customers. Amateurs visiting Olney (the town of Cowper) will find a dark room at my Olney branch, 19, Market-place, nearly opposite Cowper's House."

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.—A lecture on instantaneous photography, introducing the latest development in film-changing devices, illustrated with limelight diagrams and lantern slides, will be delivered by Mr. F. O. Bynoe (of Messrs R. & J. Beck, Limited), on Wednesday, February 17, 1897, in the photographic studio, Borough Polytechnic Institute, 103 Borough-road, S.E. The chair will be taken at eight o'clock p.m.

BEVERLEY PHOTOGRAPHIC AND SKETCHING SOCIETY.—The Fourth Annual Public Exhibition of Photographs, Paintings, and Drawings, in connexion with this Society, will be held in the Assembly Rooms, Beverley, on Easter Monday, April 19, 1897. Silver and bronze medals and certificates will be awarded as prizes. The following are the Classes:—Section A (Open): 1. Landscapes, Seascapes; 2. Architecture; 3. Portraits, Figure Studies; 4. Instantaneous Hand-camera Work (six direct prints); 5. Snap-shot Enlargements (hand or stand) showing moving objects; 6. Enlargements (ordinary); 7. Miscellaneous —For Röntgen Ray, Photo-micro, Stereoscopic, Cinematograph, and other subjects not already classified—Prints, Slides, or Films; 8. Lantern Slides (set of six). All entries and other communications are to be addressed to the Hon. Secretary, Mr. T. J. Morley, Toll Gavel, Beverley.

THE YARMOUTH CONVENTION—A resident of Great Yarmouth writes: "The Convention week here ought to be a pleasant one. Though Yarmouth has been modernised of late, it retains much that is of interest, notably the old parish church, the Tollhouse Hall, the old Towers, remains of the cloisters, the Elizabethan houses, in connexion with which may be mentioned the famous Nelson Room at the Star Hotel. Near by is the strange old harbour with its long, quaint pier, centuries old, and pretty Gorleston. Not far away are Norwich, with its Cathedral and Norman Castle; Somerleyton Hall (Sir Savile Crossley's place), with its magnificent Winter Garden; the Cliffe at Corton, seaside residence of Mr. J. J. Colman, with a noble collection of pictures; King's Lynn, Lowestoft, Cromer, Beccles, and other interesting towns. In Yarmouth the meetings would, I suppose, take place in the Town Hall, which has a very fine Assembly Room. This the Corporation have just decorated most handsomely. I ought to mention that Sandringham, the Prince of Wales's country home, is in the district, and, closer still, Blickling Hall (the Marchioness of Lothian's), the birthplace of Anne Boleyn, a great show-place. With all these to work upon, the Convention ought to have an excellent programme."

THE KROMSKOP.—Three photographs of the object are made, because three colours are required to reproduce all others; and each photograph is made by the joint action, in due proportion, of the respective fundamental colour, and all other hues into which it must enter in the reproduction; but each photograph is afterwards seen by light of the fundamental colour only, and the three are blended into one composite image. A camera, which is probably no more complicated than a Kodak, makes the negative images which constitute the colour record on a single sensitive plate at one exposure; and a contact positive from this negative, when cut in three and mounted on

lding cardboard frame, can in a moment be dropped into another optical strument, the Kromskop, which, as well as the camera, is stereoscopic, and even then not much larger than some of the ordinary hand stereoscopes. he colour record, or "kromogram," when viewed in this instrument, realises reproduction, which is so satisfying to the eye that the uninitiated imagine that is the object itself at which they are looking. It is far more realistic than y ideal colour photograph on a flat surface could be, because the image is ee from surface reflections and distracting surroundings, and is in perfect ereoscopic relief.—F. E. IVES.

WE are glad to say that a strong effort is being made by the press and kindred anches of the printing profession of London and the provinces to celebrate e Queen's Record Reign. No better or more worthy object could possibly found than the one selected, viz., to raise at least 1000*l.* to pay off the debt the Caxton Convalescent Home at Limpsfield, Surrey. It is hardly possible imagine any profession that has made such rapid strides during our beloved overeign's reign as the press, and we sincerely hope that all members, both nployers and employed, will rise to the occasion and support this excellent stitution. A grand concert will be given in the Queen's Hall on Saturday, ay 1, and the Right Hon. the Lord Mayor of London and many of the rgest and most influential firms have already become patrons, of which a inted list will shortly be issued. The Printers' Managers and Overseers ssociation, with Messrs. W. H. Burchell and A. W. Letts as joint Hon. ecretaries of the special appeal, have taken the initiative, and an influential mmittee is being rapidly formed. Cheques (for which numbered seats for e concert will be allotted and forwarded in due course) may be addressed to J. Fisher, Esq. (Messrs. Eden Fisher & Co.), Hon. Treasurer, 6, 7, and 8, ement's-lane, Lombard-street, E.C., and full particulars can be obtained om the Hon. Secretaries, Caxton Convalescent Home Special Appeal, , Chancery-lane, W.C.

PHOTOGRAPHY AND DECENCY.—A correspondent writes to the *Bristol Times d Mirror* of February 3: "The Photographic Exhibition has just closed. l who have visited it must have been struck by the remarkable advance of e science, and must have observed its high capabilities, in refined and intelli nt hands, of true artistic treatment. It distinctly showed that the mind of e photographer, like the mind of the painter, is an important factor in the rk he produces. It is in the mind of the photographer to lift most of his bjects to a high level, or degrade them to the vulgar realism that disgraces ch of our periodical literature and much of our cheap pictorial art. It is, there re, no mere prudery to say that many of our shop windows present very od signs of very bad taste when the principal attraction is the photograph of e voluptuous form of some popular actress, the line of whose figure is vered, but certainly not concealed. It seems to me, Sir, a matter at least regret when so very many earnest endeavours are made through our various ucational systems to elevate the public taste, that such a beautiful art should prostituted to low purposes. It is to be deplored that women can be found lling to submit to such treatment, and men, who lay claim to respectability, practise it, or that shopkeepers, for the profit of a few pence, should sow adcast such vulgar productions. Surely some of the photographic journals d societies, of which there are many, might endeavour to do something to vate and purify an art that is essentially popular, and has such high pabilities for useful and honourable work."

Patent News.

E following applications for Patents were made between January 27 and bruary 3, 1897 :—

RK SLIDES AND CAMERAS.—No. 1965. "Improvements relating to Photographic Dark Slides and Cameras for Process Work." Complete specification. A. W. PENROSE and W. GAMBLE.

ATE BOXES.—No. 2000. "Improvements in Plate Boxes for Photographic Cameras." Complete specification. A. HURST.

ASHING APPARATUS.—No. 2150. "An Improved Apparatus for Washing Photographic Negatives or Positives." C. S. BAYNTON and W. J. SPURRIER.

LF-TONE ENGRAVING.—No. 2215. "An Improvement in Half-tone Photo-engraving." C. T. JAGO.

NDER.—No. 2231. "Improvements in Rest and Finder for Photographic and other Instruments similarly Supported." J. MANSELL.

YING PLATES.—No. 2263. "Improvements in or connected with Apparatus for Drying Photographic Plates." D. BRADLEY, JUN.

VELOPING WITHOUT DARK ROOM.—No. 2269. "A Mode of Developing Photographic Negatives without the Aid of a Dark Room." T. MILLER.

LIEF PHOTOGRAPHS.—No. 2305. "Improvements in Methods of Producing Photographs in Relief." Communicated by H. C. Fairchild. Complete specification. H. H. LAKE.

ND CAMERA.—No. 2314. "An Improved Photographic Hand Camera for Time and Instantaneous Exposures." Communicated by E. Schieffmacher. W. P. THOMPSON.

MERA STAND.—No. 2389. "An Improved Three-fold Camera Stand." C. ST. J. PEPPER.

VELOPING CABINET.—No. 2446. "An Improved Photographic Developing Cabinet." W. T. P. TURNER.

INTING FRAMES.—No. 2529. "Improvements in the Construction of Photographic Printing Frames." W. HUDSON and H. HUDSON.

MERAS.—No. 2537. "Improvements in or relating to Photographic Cameras." T. E. C. WILSON and W. H. TOMKINSON.

M STRETCHERS.—No. 2552. "Improvements in Photographic Film Stretchers." G. CHÉRON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
15	Camera Club	Exhibition of Members' Lantern Slides.
15	Croydon Camera Club	All Slides selected on the 3rd must be brought up, together with detailed description.
15	Ealing	Flashlight.
15	North Middlesex	*Printing from the Negative.* C.O.Gregory.
15	Richmond	*Bromide Printing.* G. Ardaseer.
15	South London	*Architecture.* S. E. Wall.
15	Southport	*Intensification and Reduction.* Thomas Bolas, F.C.S., &c.
15	Southland	Marine Subjects.
16	Birmingham Photo. Society	Practical Demonstration upon the Production of Carbon Prints by Single and Double Transfer. Harold Baker and E. C. Middleton.
16	Brixton and Clapham	*Lantern-slide Making.* John A. Hodges, F.R.P.S.
16	Gospel Oak	Platinotype Demonstration.
16	Hackney	*Animal and Bird Life.* Thomas Fall.
16	Leeds Photo. Society	*Photographic Fruit from Norway.* J. W Addyman, B.A.
16	Newcastle-on-Tyne	*Intensification and Reduction.* T. Bolas.
17	Borough Polytechnic	*Instantaneous Photography.* F. O. Bynoe.
17	Croydon Camera Club	Thirteenth Public Lantern Show.
17	Leeds Camera Club	Demonstration. Eastman Company.
17	Leytonstone	*Photo-micrography.* E. Hill.
17	Photographic Club	*Some Rule-of-thumb Tests of Photographic Lenses.* S. H. Fry.
17	Stafford Y.M.C.A.	*Treatment of Figures.* E. H. Neighbour.
18	Ashton-under-Lyne	*Landscape Photography.* J. W. Wade.
18	Aston	*Practical Microscopy.* H.W.H.Darlaston.
18	Camera Club	*Practical Use of X Rays.* Sydney Rowland.
18-20	Goldsmiths' Institute	Annual Exhibition.
18	Isle of Thanet	Annual Lantern-slide Exhibition.
18	Leigh	Competition: The Seasons.
18	Liverpool Amateur	*Animated Photographs.* Walter Archer.
18	London and Provincial	Lantern Night: Dr. Kaempfei's Set of British and Spanish Architecture.
18	Oldham	*Lantern-slide Making by Contact.* W. A. Nash.
18	Putney	*Instantaneous Photography.* W. J. Colebrook.
18	Stockport	*Shakespeare at Home.* Snowden Ward.
18	West Surrey	*Enlarging.* J. Bull.
18	Woodford	*Some Failures and their Lessons.* F. G. Emler.
19	Croydon Microscopical	Trial Night, Members' Slides, for Lantern Evening in March.
19, 20	West London	Annual Exhibition.
19	Wolverhampton	*The Garden of England.* J. Gale.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 9,—Annual General Meeting,—Sir H. Trueman Wood, M.A., in the chair.

AFFILIATION.

The HON. SECRETARY announced that the following Societies had been admitted to affiliation:—Leicester and Leicestershire Photographic Society, Sheffield Photographic Society, Bolton Photographic Society, East Worcestershire Camera Club, Plymouth Photographic Society, Munster Camera Club, and Beaconsfield Camera Club.

ANNUAL REPORT AND ACCOUNTS.

The annual report of the Council was then read. The following are extracts:—

"The following table shows the changes that have taken place in the numbers of the fellows and members of the Society during the year:—

	Honorary Fellows.	Life Fellows.	Fellows.	Life Members.	Members.	Non-resident Members.	Totals.
DURING 1896—							
Enrolled	0	3	18	1	78	0	100
Transferred from other columns	0	0	0	5	2	3	10
	0	3	18	6	80	3	110
Died	0	2	1	1	2	0	6
Resigned	0	0	11	0	10	0	21
Transferred to other columns	0	0	2	2	23	0	27
	0	2	14	3	35	0	54
On January 1, 1896 ...	6	37	194	52	258	13	560
To add as above	0	3	18	6	80	3	110
	6	40	212	58	338	16	670
To subtract as above ...	0	2	14	3	35	0	54
On January 1, 1897 ...	6	38	198	55	303	16	616

"Those lost to the Society by death are—General Sir Charles Keyes, G.C.B., Thomas Samuels, Colonel G. H. Lloyd-Verney, Alexander Johnston, William England, F. E. Currey.

"The extra Technical Meeting on the third Tuesday in each month arranged to provide for the increasing need of facilities for the discussion of photo-mechanical subjects, has been continued. The Council express the hope that those who are especially interested in these matters will do their best to make these meetings still more successful.

"The Exhibition at the Gallery in Pall Mall was conducted as usual, the selection of the exhibits being entrusted by the Council to a Committee in which the Judges were included.

"The following tables compare the details of the Exhibition with those of the few preceding years.

Year.	Frames.	Photographs.	Portrait and figure subjects	Landscape and architecture.	Miscellaneous.
1891	628	1086	399	508	179
1892	543	1072	458	433	181
1893	336	587	270	247	70
1894	481	679	225	276	178
1895	459	615	174	287	154
1896	353	361	96	208	57

Year.	Members.	Non-Members.	Town.	Country and foreign.
1891	74	109	94	89
1892	67	135	105	97
1893	54	106	89	71
1894	65	129	102	92
1895	78	129	113	94
1896	71	97	86	82

"There were also 230 transparencies (including lantern slides) and 27 apparatus exhibits. The number of exhibitors whose work was accepted was 168 There were 17 Foreign and Colonial exhibitors, namely, eight sending from the United States, two from Italy, and one each from Austria, Belgium, France, Germany, Holland, India, and New Zealand.

"The catalogue included a large number of reproductions of photographs in the Exhibition by the half-tone process, as well as line sketches of those more suited for illustration in this manner. In addition to these, the apparatus exhibits were, as far as possible, described and illustrated, and the general style and appearance of the catalogue improved. The experiment was tried of supplying, on sale in the Gallery, cloth-bound copies of the catalogue at a shilling. This was so far successful that double the number originally provided were disposed of.

"The Exhibition was open daily as usual. The attendance was very satisfactory, the total number of visitors being 11,343, as compared with 9216 in 1895, and the amount received from admissions 285*l.* 2*s.* 9*d.*, as against 209*l.* 8*s.* 1*d.* in 1895. Demonstrations were given every afternoon with the Röntgen rays, for which the Society is indebted to Messrs. W. Watson & Sons, and to Messrs. Hurst & Company. The Exhibition was open on Monday, Wednesday, and Saturday evenings, and lantern slides were shown on the screen on each occasion. Through the courtesy of affiliated and other Societies, as well as of some of the members and others, the slides shown were varied on each night. Through the kindness of Mr. Birt Acres, his Kinematoscope was exhibited each evening.

"The library has been again largely increased, although the extensive collection of the older works on photography now in the Society's possession limits the number of additions which it is possible to make. Eighteen volumes have been presented to the Society, about sixty have been acquired by purchase and exchange, together with a large number of periodicals dating back as far as 1850. The most important acquisitions during the year have been a number of volumes of *Humphrey's Journal of Photography*, extending from 1857 to 1868, and Talbot's *Pencil of Nature*, 1844–6. These, with seventy-six volumes of current serial publications, acquired by exchange, bring the total number of volumes, added during the year, to about 170.

"The permanent collection of photographs has been increased by six works from our Exhibitions, which have been specially selected by a Committee, and generously presented to the Society.

"The museum is slowly growing. The members are particularly urged to do what they can to enhance the value of this collection of historically interesting relics. Any information with reference to suitable objects will be gladly received by the Secretary.

"The balance-sheet on the receipts side shows a decrease as compared with 1895, as in that year the new class of Fellows was created, and the amount paid for life Fellowships amounted to 444*l.* 3*s* ; with that exception the other receipts compare favourably with previous years, the total amount being 1521*l.* 9*s.* 11*d.*

"The increase on the expenditure side includes 20*l.* due to the rent of Hanover-square rooms as against that paid at Great Russell-street, 40*l.* increase in salaries paid to Assistant Secretary and Clerk, the total expenditure being 1566*l.* 19*s.* The assets and liabilities are fully stated, leaving a balance in favour of the Society of 810*l.* 10*s.* 3*d.*

"The Council having taken steps to carry into effect the resolution informally adopted by the Special General Meeting held on the 19th of December, 1895, the President and Honorary Secretary, who took exception to the proposed method, tendered their resignation, and these were accepted with expressions of regret.

"The Council then elected the Earl of Crawford President, and Mr. Horace Wilmer Honorary Secretary."

The CHAIRMAN moved the adoption of the report of the Council for the past year, which was taken as read.

Mr. T. R. DALLMEYER seconded the motion.

Mr. SEBASTIAN DAVIS regarded the report as highly satisfactory, but expressed his disapproval of the exclusion from the last Exhibition of a very large number of pictures of an interesting character, the absence of which had, in his opinion, destroyed the representative character of the Exhibition. With the exception of about a dozen extravaganzas, he had no objection to the hanging of the photographs actually exhibited, but he thought the collection should have formed a complete epitome of photography in all its departments. There were some excellent specimens of "ideal" landscapes, made by printing from two or more negatives, and elaborately finished with brush or pencil, but there should have been a more adequate representation of photography pure and simple. Portraiture, too, was not duly represented. Photography afforded the only means within the reach of a vast number of persons for perpetuating the features of their friends and relatives, and by which portraits might be handed down from generation to generation if they did not fade; and this branch should be illustrated by a larger proportion of first-class work than had in recent years been exhibited. Red baize was undoubtedly a pleasing object to look upon, but when it became a dingy brown baize, and a considerable portion of the walls was given up to it, he thought the space might have been better occupied if it had been devoted to a display of the varied applications of photography.

The report was then adopted without dissent.

Mr. J. J. VEZEY moved the adoption of the balance-sheet, and Mr. A. W. ISENTHAL seconded.

Mr. HERBERT FRY called attention to the fact that the subscriptions of life members were treated as current receipts, and suggested the advisability of placing a part of the amount to a reserve account.

Mr. W. THOMAS expressed some surprise that the financial result of the Exhibition was not more satistactory, having regard to the fact that the receipts had exceeded those of the previous year by 75*l.*, and thought the members should assist the Council, upon whom the burden of the work lay, by endeavouring to secure a larger sale of tickets.

Mr. G. SCAMELL (Hon. Treasurer) said that, although the accounts showed that the balance was less at the end than at the beginning of the year, taking the liabilities and assets into consideration, there was actually a gain on the year of about 6*l.* If the subscriptions of life members were invested, it would frequently be necessary to sell stock to meet current expenditure; but, as a matter of fact, 40*l.* had been invested in the library, so that there was actually an investment in property, if not in Government funds. The extra expenses in connexion with the Exhibition were principally in respect of advertisements, which increased from 74*l.* in 1895 to 116*l.* in 1896, the result being that 11,300 persons attended in 1896 as against 9200 in the previous year.

The motion was then put and carried unanimously.

ELECTION OF COUNCIL, &C.

Mr. W. ATKINSON read the report of the Scrutineers, the result of the voting being as follows:—*President:* The Right Hon. the Earl of Crawford, K.T.—*Vice-Presidents:* Messrs. T. R. Dallmeyer, H. Chapman Jones, John Spiller, and Sir H. Trueman Wood.—*Council:* Messrs. T. Bedding, T. Bolas, F. A. Bridge, J. Cadett, E. Clifton, A. Cowan, W. E. Debenham, F. E. Ives, Rev. F. C. Lambert, A. Mackie, J. W. Marchant, A. Pringle, J. A. Sinclair, Arnold Spiller, J. W. Swan, E. J. Wall, H. Snowden Ward, L. Warnerke, Paul L. Waterlow, and Horace Wilmer.—*Treasurer:* Mr. George Scamell.

The CHAIRMAN declared these gentlemen duly elected, and read a telegram sent from Singapore by the Earl of Crawford, expressing his acceptance of the office of President of the Society.

Votes of thanks were passed to the Council and officers of the past year, and to the Auditors and Scrutineers.

THE PROGRESS MEDAL.

The HON. SECRETARY said he had lately seen M. Gabriel Lippmann, who had kindly consented to read a paper before the Society in June next, when the Progress Medal which had been awarded to him would be presented by the Society.

MONSIEUR CHASSAGNE'S COLOUR PROCESS.

The CHAIRMAN exhibited several examples of photographs produced by M. Villedieu Chassagne by his method of photography in colours, and expressed his belief in the genuineness of the process. Sir H. Trueman Wood gave no details beyond those given in his note in the *Journal of the Society of Arts*, reprinted in our last issue, but stated that he had undertaken to read a paper upon the subject before that Society. He urged, however, that the consideration of the prints should not be prejudiced by the fact that the method of production was kept secret, as it was only natural that the originator of an invention of commercial value should seek to secure a reasonable return for himself.

The Hon. Secretary, who had recently seen M. Chassagne in Paris, showed two large transparencies in colours which M. Chassagne had produced.

The various specimens were examined with a great deal of interest by the large gathering of members present. When viewed by the incandescent electric light, by which the Society's room is illuminated, they could hardly be distinguished from ordinary silver prints; but, when placed in the path of the rays proceeding from an arc light in the lantern, the colours were fully apparent.

A vote of thanks was accorded to the Chairman and the Hon. Secretary for bringing these early examples of the latest process before the Society.

PHOTOGRAPHIC CLUB.

FEBRUARY 3,—Mr. Frank Haes in the chair.

A letter was read from Mr. Evans, offering to give the Club a set of eighteen slides entitled *Hedgerow Studies*.

Mr. Evans was cordially thanked for this act of courtesy, which was much appreciated.

Mr. Welford showed some silver and bronze medals which had been awarded to Mrs. Welford in Mellin's Art Competition. They were handsomely and uniquely mounted in morocco leather cases, and in such a way that either side could be inspected without fingering the medal.

Particulars of Sandell's Competition were read to the members by the HON. SECRETARY.

Mr. Erny was elected a member of the Club.

Mr. Smith showed examples of bromide prints made with Salmon's patent vignette.

Mr. Snowden Ward handed round a sample of photopake, manufactured by the Vanguard Manufacturing Company at Maidenhead.

Mr. SNOWDEN WARD delivered a lecture on

ACETYLENE.

He said that, although spoken of as new, acetylene was known and isolated as far back as 1836, not by Sir Humphrey Davy, as usually stated, but by Edmund Davey. Berthelot investigated its properties fully in 1859. It was the accidental discovery of a method of producing calcium carbide cheaply in the electric furnace which brought the gas into prominence. The lecturer dealt at some length with the process of manufacture, and the relative cost and efficiency of the English, American, Swiss, and German samples, stating that certain German samples at 16*l.* per ton were not such good value as the British at 28*l.* per ton. The impurities which were most frequently met with were sulphuretted hydrogen, phosphuretted hydrogen, and ammonia. He stated that the carbide could be rendered waterproof by treating with pitch. Dealing with the subject of generators, their construction was made clear by a series of lantern-slide diagrams. He showed generators made by Thorn & Hoddle, Smith of Aberdeen, the Simplex, and other makes, and described their advantages and disadvantages. An important point, but at the present moment a weak one, in connexion with the gas is the burner. Bray's five-cipher burner is practically the best. He demonstrated this, and showed a cluster of three burners, which he stated was the most improved form for use in the lantern. Summing up, he praised acetylene as being less dangerous and more efficient for general illuminating purposes than coal gas. The products of combustion are not only less in quantity, but of a less harmful nature than with coal gas.

A member asked whether the lecturer thought that the new gas was of any use at all for photographic purposes?

Mr. SNOWDEN WARD said that he thought it would be useful for enlarging purposes, for the lantern, and for portraiture. He thought, as far as he had seen at present, the portrait installations possessed an insufficient number of burners. The present position of the insurance companies towards acetylene is not likely to advance its use and popularity, but is likely to change as the gas becomes better known.

Borough Polytechnic Photographic Society.—February 3, Mr. BEDDING (Chairman) read a paper on

PLATINOTYPE PRINTING,

pointing out the permanent and artistic character of prints made on platinum paper, which it was impossible to obtain with the ordinary glossy P.O.P. of to-day, and, although perhaps a trifle dearer at the outset, this extra cost was soon covered by the saving effected in time and labour alone, as the tedious and uncertain processes of toning and fixing were entirely done away with, and it was possible to develop, fix, wash, and mount a platinotype print in less than half an hour. At the conclusion of his remarks, Mr. Bedding developed various prints, sent for this purpose by the Platinotype Company, first by floating the prints on the ordinary developer, and then by the addition of glycerine; several were developed by using a camel's-hair brush.

ON Friday evening, February 5, a large number of members and friends proceeded to Westminster, at the invitation of the Brin's Oxygen Company, for the purpose of inspecting the extensive works situated in Horseferry-road, and the *modus operandi* of compressing gas was fully explained by the courteous managers.

AT a Special General Meeting, held on Wednesday, January 20, Mr. P. J. Brown was elected Hon. Secretary of the Society, in the place of Mr. P. C. Cornford, resigned; and Mr. P. J. Ridd was elected Assistant Hon. Secretary.

Brixton and Clapham Camera Club.—February 2.—Mr. J. A. SINCLAIR, F.R.P.S., gave a demonstration of

THE ARTIGUE METHOD OF CARBON PRINTING.

The bad weather was responsible for difficulties in printing the specimens intended for demonstrating the process, Mr. SINCLAIR stating that the whole day's printing had only resulted in a half-tint being registered by the actinometer. In despair, he had exposed for an additional hour to the light of the incandescent gas, and this had effected more than the whole exposure to what should have been daylight. With such great under-printing he was afraid the results would be very poor, but he would go through the process of development, and explain the usual method of working. The Artigue method of carbon printing without transfer, like other carbon processes, is based upon the property of bichromatised gums, gelatine and other colloids, becoming insoluble when exposed to light. About fifty years ago the early experimenters coated paper with a mixture of vegetable carbon, gum, and bichromate of potash, developing without transfer, but the method was useless for any but line subjects owing to the serious loss of half-tone. Later on, Pouncy and Blair worked upon similar lines to the present Artigue process, Blair, in 1863, publishing particulars and formulæ which are probably almost identical with Artigue's, and there is no doubt but that with present-day facilities at his command he would have anticipated Artigue by many years. In 1864, Swan took out his patent for the carbon system with transfer, and this process, with slight improvements, still holds the field, and is likely to do so, for commercial purposes. Artigue's tissue is a white paper coated on one side with a very thin, almost transparent, black pigment, and presents a fine matt appearance. The first specimens of work shown on it were very deficient photographically, owing to the absence of half-tone, although they may have suited the adherents of the "art" school—to whom the paper offers immense scope of "faking" and brush work. As supplied, the paper is insensitive. It may be sensitised by painting on the back with a five per cent. solution of potassium bichromate, but the preferable alternative is to immerse the tissue for two minutes in a two per cent. solution of the same substance. Air bubbles are not likely to form; but, should they do so, remove by lifting the tissue out of the solution and reimmersing; on no account touch the tender surface of the paper. The temperature of the sensitising bath should not exceed 60° or the pigment washes away, and an excessive temperature also renders the paper too highly sensitive; this difficulty can be partly got over by mixing alcohol with the bichromate solution, which will not then keep, however. The longer the immersion the greater the contrast, just the reverse to ordinary carbon tissue. At this time of the year no difficulty occurs in drying if the tissue is sensitised at night and suspended in the dark room, it will be dry and ready for use in the morning; but, in summer, the drying room must be kept cool with ice; if the room is too warm, the tissue seems to partly dry, then to tear away in streaks and melt. The prepared paper does not keep more than a week or two, and is best used the day after being sensitised; if kept longer, development is more difficult. In printing, the tissue is placed with coated side in contact with the negative and an actinometer—Burton's, Sawyer's, or Artigue's—used to judge the exposure. In even summer light the actinometer may be dispensed with, ten minutes' printing in bright summer light being equivalent to the tint on the actinometer. Artigue tissue is about three times the rapidity of silver paper. Some traces of the image can be seen by transmitted light. To develop, the print is first immersed in warm water until an outline of the image appears—with proper printing about fifteen seconds—then fastened at the edges by clips on to a piece of glass or opal, and removed for a few minutes to cold water. To complete development, a mixture of very fine sawdust (specially prepared by Artigue) and water is made to about the consistency of rich pea soup, and raised to a temperature of from 60° to 70°. The print, on its glass support, is held over the bowl containing the sawdust soup, some of which is poured along the top edge of the print, so that it runs evenly over the whole surface, in reality acting as a fine file, and removing the soluble pigment along with it. A brush or cotton-wool may be used instead of the cotton-wool, but is not so even or certain. The print is occasionally rinsed in cold water, to see the progress of development, which is carried on somewhat further than seems necessary, the print gaining strength in drying. Considerable control over results obtains in development. Soft grey tones are obtained with cool developer and thick solution; hot developer and thin solution give brilliant blacks. Under-exposure has a tendency to give greys; over-exposure, brilliancy. With correct printing, development proceeds regularly and evenly. It is usually best to commence development with thick solution, and work to thin. If under-printed, start development at 80° to 90°, but too warm solution dissolves everything off the paper. If much over-printed, soak for half an hour in cold water before development. The sawdust can be used over and over again. After development, wash in cold water, finally placing for ten or fifteen minutes in a five per cent. solution of alum, to harden the surface and to remove all traces of bichromate from the paper. Drying, trimming, and mounting are then carried out as usual. In answer to questions, Mr. Sinclair said the tissue could not be bought ready-sensitised, and was at present only supplied in engraving black, although red and sepia had been promised for several years. The paper was rather expensive, a sheet costing a shilling cutting up into about nine quarter-plate pieces. It is necessary to obtain the special sawdust from Artigue. So far as he was aware, none prepared in England is satisfactory, although he had heard of bran middlings, well washed to remove the gluten, &c., being successfully used. As, however, the sawdust can be used repeatedly for about ten months, the expense is not important. Good negatives, full of detail and not too dense, are requisite, and with certain negatives results superior to anything possible with other processes are obtained. Extremely fine definition can be got, quite equal to P.O.P. This is probably due to the thin coating and fine pigment used. No special care is required in development, but the paper is very delicate, and must not be fingered. Printing does not continue, as with ordinary carbon tissue, between exposure and development; the film is probably too thin to hold the moisture which seems essential for the continuating action. The prints developed by Mr. Sinclair proved, as expected, much under-exposed, and it was surprising what Mr. Sinclair got out of them, fully substantiating the claim for latitude in exposure made on behalf of this paper. Some finished and mounted prints brought for examination were really superb, Mr. E. DOCKREE remarking, in proposing a vote of thanks, afterwards unanimously awarded to Mr. Sinclair, that they were among the finest examples of photographic work he had seen, excelling even platinotype in resemblance to steel engravings.

Dulwich Photographic Society.—February 2.—The medals awarded at the recent Exhibition of the Society were presented to the successful members by Mr. C. Dunlop. Afterwards a demonstration on

ENLARGEMENTS

was given by Messrs. E. W. Beer and G. Smith, two members of the Society. Enlargements were made from quarter-plate pictures to 12×10, to the satisfaction of all present.

Gospel Oak Photographic Society.—January 19.—A lecture on

PICTORIAL COMPOSITION,

by Mr. Horsley Hinton, was read by the Vice-President, and evoked a good deal of interest and discussion from the members. Although but few of the members were in sympathy with the views expressed by Mr. Horsley Hinton on the subject of "Art in Photography," yet it was agreed that a good deal was to be gained from the lecture. At the close of the lecture the accompanying slides were passed through the lantern, and duly criticised, special praise being given to those by other workers, included in his lecture by Mr. Horsley Hinton, in furtherance of his ideas of art in photography.

Hackney Photographic Society.—January 26, Mr. W. Rawlings presiding.—A valuable lecture on

THE STUDY OF CHEMISTRY AND PHYSICS IN THEIR RELATION TO PHOTOGRAPHY

was given by Mr. J. WILMER-COLE, who urged the importance of the subject as an aid to progress.

February 2, Mr. J. O. Grant presiding.—Mr. F. W. Gosling read a paper on *Failure*, in which he described in detail the difficulties most frequently besetting the photographic path, and brought up a great number of prints and negatives to illustrate various "failures," their respective causes and cures.

Leytonstone Camera Club.—February 3, Dr. Turner in the chair.—Mr. G. H. Cricks gave an evening on

Isochromatic Photography.

In showing the advantages of isochromatic plates, he said that, in photographing colours, the green and yellows were rendered in their tone as seen by the eye, and not black, as usually shown when taken by ordinary plates. He advocated the use of the yellow screen with discretion, and only when absolutely necessary, as the screen often kills the haze in the distance and spoils the picture; with flowers, he found these plates absolutely necessary. With paintings, by using isochromatic plates with screen, the blue rays are cut off from reflections of cracks and brush marks, and, as the plates are sensitive to the yellow rays, the defects of the picture do not show so bad, as most old pictures are largely composed of yellowish-brown tones. In portraiture they render the colours of dresses, &c., and, being strongly sensitive to yellow, do not show the marks on faces or freckles, and make retouching almost superfluous except for removing defects. He also found them most important for landscape. He recommended the use of the screen, as by cutting off the blue rays gives more latitude in exposure, and gives the clouds on the same plate of printing quality as well as the landscapes. With correct gradations effects can be caught of evening effects, &c., that could not be caught in any other way. The screen should not be used in clear weather; the plates were also invaluable for autumn foliage. It was also possible to use the yellow screen with hand cameras, and with an aperture of *f*-5·6, with a one-twenty-fifth of a second, to obtain many subjects with cloud effects that cannot be gained otherwise. Using rapid plates, isochromatic plates were no more difficult to work than ordinary plates; he advocated plenty of ruby light and develop with pyro soda, or metol.

North Middlesex Photographic Society.—February 8, Mr. C. R. Steele in the chair.—The following gentlemen were elected members of the Society:—Messrs. E. C. Parker, H. Holmes, A. G. Lawson, J. Wilson, W. D. Williams, and C. W. Snell. Mr. J. MacIntosh then read his lecture on

Intensification and Reduction,

illustrated by lantern slides. This exceedingly interesting and excellent lecture has been given before at the Royal Photographic Society in connexion with the Affiliation of Photographic Societies, and a full report would be superfluous, but one intensifier the lecturer strongly recommended was Edwards's, as follows:—A. Mercuric chloride, 60 grains; water, 8 ounces. B. Potassium iodide, 180 grains; water, 2 ounces. C. Hypo, 120 grains; water, 2 ounces. Add A to B; shake well and add C. Soak negative in this bath till it is sufficiently dense and wash. As this is a one-solution intensifier, there is no guesswork about the intensity to be obtained. Local intensification can easily be obtained, and is much superior to pigments applied to the film. After a few questions had been asked and replied to, Mr. Beadle proposed a vote of thanks to the lecturer, which Mr. Mummery seconded. Mr. S. E. Wall was elected Chairman for the meeting on February 22, when Mr. Oakden will lecture on *Architectural Photography*.

Polytechnic Photographic Society.—February 11.—The paper on

Retouching,

by Mr. Wolfgang Arndt, proved most interesting and enjoyable. The subject one would think rather dry, but it is not, that is, if Mr. Arndt is explaining it. Commencing by saying he was not a public speaker, the lecturer read us a most practical and instructive paper, with a vein of humour from beginning to end. Then came the pencil sketches. Mr. Arndt had three or four negative drawings of ladies's heads, with—well, sinful expressions on their faces. These, with a piece of chalk, he gradually retouched, explaining each stroke the while, until the drawings were transformed into beautiful faces. Mouths were turned up, noses made straight, and spots taken out in a most wonderful and encouraging manner. At the close of the meeting a very hearty vote of thanks was given, and the hope expressed that it was not the last time we should see Mr. Arndt. Thursday, the 18th inst., Mr. Gear is down for a paper on *Combination Printing*, with practical illustration.

Richmond Camera Club.—February 1, Mr. Cembrano presided.—The subject for the evening was

Bromide Printing,

being one of the elementary series of the session, which was ably handled by Mr. Ardaseer. After touching upon the properties of bromide paper, its advantages and disadvantages, and the different developers which might be used, Mr. Ardaseer exposed and developed some prints with satisfactory results. He also showed some very fine enlargements on different makes of bromide paper by Morgan & Kidd, the pioneers in its production, including the ordinary surface, enamelled, and the newly introduced matt.

Cardiff Photographic Society.—Mr. W. H. Kitchen entertained the members with a display of lantern slides of a varied and interesting character. Most of the views were of the historical ruins of the country. Some excellent water "bits," with telling skies, were also conspicuous. Amongst the slides were some of Mr. Kitchen's instantaneous pictures—a branch of photography to which he has given considerable attention. An interesting collection of pictures, associated with the recently elected Industrial Exhibition, were much admired. These were principally the work of Mr. S. W. Allen, the President of the Society. In these pictures the members were able, in many instances, to compare slides made by contact printing from whole-plate negatives with others by reduction from the same negatives. The reduced slides showed, perhaps, rather too small a scale of reproduction, but were otherwise good. An extraordinarily large number of slides were put through the lantern, advantage being taken of the automatic delivery principle upon which the instrument is constructed. Mr. Kitchen was cordially thanked for his entertainment, and a similar vote to the President closed the proceedings. The Society proposes to hold an Exhibition of competitive work, restricted to those members who have never secured awards at any show. The pictures will be displayed on March 12.

Leeds Photographic Society.—February 4.—The Annual Lantern Exhibition of this Society took place in the Albert Hall, Mr. Peter Gilston (President) in the chair. There was a numerous gathering of members and friends. As a record of the work of last year the Exhibition was interesting. Some enthusiasts place photography almost on a level with the art of the painter. The photographer may have the training of the artist, but he is in a large measure dependent upon his camera, which, of course, has no power of discrimination, and to a great extent fails to note the subtleties of nature. But its inability to render faithfully values of light and shade is its worst failing. Notwithstanding, pleasing results can be obtained, as was evidenced by the hearty applause which greeted a number of the slides. Whitby seems to be a happy hunting ground for members of the Society. Views of the quaint old streets and the interesting harbour were numerous. Bolton Abbey, too, is held in high favour. The following members exhibited slides:—Messrs. J. A. Moxon, F. W. Branson, T. Butterworth, A. W. Atkinson, J. H. Briggs, H. P. Atkinson, B. A. Burrell, S. Margerison, Godfrey Bingley, J. H. Walker, F. Waddington, W. Denham, G. H. Rodwell, R. Stockdale, F. Brundrett, C. R. H. Pickard, J. E. Greaves, A. Nicholson, H. C. Watson, and A. C. Beilby. Mr. Godfrey Bingley described the views as they were thrown upon the screen. An electro arc light, lent by Mr. F. J. Borland, electrical engineer, was used in the lantern.

Oxford Camera Club.—February 3, Annual General Meeting.—Mr. E. A. Ryman-Hall presided. The Secretary's report showed that there are now seventy-nine members, and that the Club has had a very successful season. The Treasurer's report showed that there was a good balance in hand. An alteration in the rules was proposed but not carried. The following officers were elected for the ensuing year:—*President:* Sir Wm. J. Herschel, Bart. (re-elected).—*Vice-Presidents:* Miss Ackland, Mr. E. A. Ryman-Hall, Colonel E. C. Impey, Mr. V. P. Sells, M.A.—*Committee:* Messrs. J. E. Horrigan, E. C. H. Jessop, J. Minn, G. Shelton, Dr. M. D. Stark, Miss Venables, and Mr. J. B. Wilson.—*Auditor:* Mr. J. E. Horrigan.—*Librarian:* Mr. J. Squire (re-elected)—*Treasurer:* Mr. R. A. R. Bennett, M.A. (re-elected).—*Joint Hon. Secretaries:* Messrs. G. W. Norton, 13, Park-terrace; and H. A. Holliday, 17, Broad-street. Cordial votes of thanks were passed to the outgoing officers, especially to Mr. Sells, who was obliged to retire from his post of Hon. Secretary owing to press of engagements. Great regret was expressed at the loss of his valuable services.

Sheffield Photographic Society.—February 2, the President, (Mr. Tomlinson) occupied the chair.—It was announced that the Society had been affiliated to the Royal Photographic Society, and Messrs. Tomlinson and Ellis were appointed delegates. Some bromide prints, developed with the formulæ as used by Mr. Camp at the last meeting, were shown by Mr. Tomlinson and considered very satisfactory. A lecture on

Intensification and Reduction,

prepared by Mr. Thomas Bolas, F.C.S., illustrated by lantern slides, was read by Mr. Ellis, and the lantern was manipulated by Mr. J. H. Lygo. The lecture was very instructive, various formulæ being given of which most of the members took advantage, and at the close a discussion took place regarding the various methods of intensifying and reducing.

Southsea Amateur Photographic Society.—This Society held their Ninth Annual Meeting on Wednesday, February 3, at the Society's Rooms, Portsmouth, and the Hon. Secretary read a remarkably satisfactory report of the Society's progress during the past year, showing a net increase of twenty-six members, and also that its financial condition was of the soundest, the income of the Society amounting to nearly 80*l*., as against 50*l*. in 1895. The business of the evening included the election of new officers for the ensuing year, and the following were elected:—*President:* Mr. A. Fisher, A.S.A.—*Vice-President:* Mr. G. Whitefield.—*Council:* Colonel H. W. B. Bruno, Colonel C. Wilkinson, R.E, F.R.P.S.; Dr. Newby, F.R.C.S.; and Mr. G. Wood, A.R.I.B.A.—*Hon. Treasurer:* Dr. F. Lord.—*Hon. Secretary:* Mr. H. T. Lilley, M.A.—*Assistant Hon. Secretary:* Mr. F. J. Mortimer.

Wakefield Photographic Society.—February 5.—This Society met to listen to a lecture by Mr. A. Keighley, President of the Bradford and Keighley Photographic Societies, on

The Principles of Art as applied to Photography.

The lecture was illustrated with lantern slides of diagrams showing the several rules of composition, perspective, and chiaroscuro, of copies of paintings, some of which were good samples of artistic treatment, others the reverse, the several points being lucidly explained, the rest of the slides being examples of artistic photography made by the lecturer. They were splendid examples of technical excellence, and admirably illustrated how the principles of art could be applied in the making of an artistic and pleasing photograph.

Wolverhampton Photographic Society.—February 2.—A lecture was delivered by Mr. E. A. Day, the Hon. Secretary of the Walsall Amateur Photographic Society, the subject being

What to Take it and How to Take it.

The lecture was appropriately illustrated by a large number of excellent

antern slides. The choice and composition of the subject for a picture, the strong and weak points, and the method of finding them, the necessity of unity and breadth in the composition, and the value of the foreground, were fully dealt with. The respective advantages of hand and stand cameras, and methods of using them according to circumstances were pointed out, and length of exposure and development, portraiture, figures, animals, landscapes, marine, and winter subjects were all treated of, and examples shown on the screen. The advantages of printing clouds into some pictures and trimming away unnecessary parts were explained. An example of combination printing was shown in a view of Anne Hathaway's cottage, where the bare straight lines of the road were obviated by printing in a flock of sheep from another picture, and the method of doing it was explained on the screen. The lecture was listened to with much interest, and closed with a hearty vote of thanks, on the motion of the PRESIDENT (Mr. H. E. Perry). The lantern was manipulated by Mr. J. Gale.

Edinburgh Photographic Society.—February 3, Mr. James Patrick in the chair.—The principal business of the evening was a discussion on

PRINTING PROCESSES.

Mr. R. AYTON spoke upon the advantages of the platinotype process, explaining that no paper had done more to advance the artistic and pictorial aspect of photography than this. There was a general idea, he said, that to produce good platinotype prints a strong negative was necessary; but this idea was erroneous, as a thin negative, so long as it was not over-exposed, was capable of giving first-rate prints. To prove this, a print on gelatino-chloride, and another on the Autotype Company's platinotype paper, both done from a thin negative, were shown, the platinotype being quite as vigorous as the other. Mr. J. B. JOHNSTON then dealt with the carbon process, giving his opinion that this was the finest of all printing methods, and one which was capable of giving any result desired. What could be obtained by any other printing process could be obtained at least as well in carbon. There was no advantage in the use of a multiplicity of processes when one could give any result wished for. Mr. F. P. Moffat explained the advantages to be derived from the use of gelatino-chloride (matt) paper. The paper gave very artistic results, was very like platinotype, and gave, he believed, a permanent image. Mr. R. Irvine, F.R.S.E., read a paper on *Acetylene Gas*. There was no danger, he said, in the use of this gas in the hands of a person who used ordinary care. Twelve sixty-candle-power burners had been found to give good results for drawing-room portraiture.

FORTHCOMING EXHIBITIONS.

1897.	
February 12–27	Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.
,, 12, 13	Photographic Society of Ireland. Hon. Secretary, Victor E. Smyth, 35, Dawson-street, Dublin.
,, 25–27	Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.
March 6–13	South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
April 19	Beverley Photographic and Sketching Society. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"THE SOUL OF TRADE."

To the EDITORS.

GENTLEMEN,—I am much pleased to see from the tone of your JOURNAL (which I also have regularly received for ten years) that your interest in the above subject has not abated, and that you are so far in sympathy with my views expressed in a previous letter.

I think your suggestion of combination amongst assistants a thoroughly good one, and, as an employer of qualified labour, I should welcome it, but what I should also like to see is a strong combination amongst professionals; but here we come face to face with many difficulties, and one in particular that seems insurmountable, I refer to the jealousy and bitterness existing amongst photographers in small towns; no doubt, gentlemen, you have seen instances of this, but I hope you will pardon a reference to my own experience.

I have been in business here for ten years (I am the "new comer" referred to by one of your correspondents), but have never been able to enjoy what I always feel a pleasure, viz., a chat with a fellow-photographer, unless he happens to live about twenty miles distant. I suppose this is the penalty of success, but it certainly cannot add one farthing to any one's banking account, but, on the other hand robs the whole profession of the strength of unity. A reference to the existing state of things in your popular JOURNAL will, no doubt, be a step in the direction of conquest.

Your correspondent who signs himself Thos. Mills must certainly "sail along successfully," for he has gone far out to sea (see), possibly in search of the headquarters of "The Self-praise Society." What is the good of publishing "the guinea" price-list, and, at the same time, advertising *portraits from 3s. 6d. per dozen*, or *twenty-five stamps for 2s.* (see enclosed circular)?—I am, yours, &c., JOHN WICKENS.

Upper Bangor.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Herbert Houghton Wragg, Leigh, Lancashire.—*Photograph of Mr. Joseph Bates, champion skater, of Leigh, Lancashire.*

ELPHIN.—Methylated spirit will answer.

F. W. BLYTH.—Many thanks for the cutting. We have repeatedly referred to this system lately.

DALY & SON (Tralee).—1. Yes; on December 1 last. 2. Quarterly, 2*s.* 9*d.*; half-yearly, 5*s.* 5*d.* 3. No.

URGENT.—Sorry we cannot say. The burners referred to by the author of the paper, Mr. W. H. Walmsley, of Chicago, are evidently American.

A. C.—We know of no such book. In *Work*, the *Illustrated Carpenter and Builder*, and similar journals, articles on the subject have, we believe, appeared.

INQUIRER.—We believe that both processes are, or are to be, patented. The specifications are not yet available, so that we cannot give the particulars asked for.

EDGE.—The Faultless brand of albumenised paper is made by Mr. H Montague, 226, Marylebone-road, W. We are unable to answer your other questions.

COLLOTYPE PLATES.—H. HORTON. These are not articles of commerce like dry plates. They must be prepared by the worker as required, as they will only keep a day or two after they are coated.

TRANSPARENCIES.—INQUIRER. If the stereoscopic transparencies bear the name of Ferrier, they are made by the old albumen process, and were probably made thirty years ago—possiby more than that.

THE POISONS ACT.—"104" says: "Can you tell me what chemicals we are prohibited from selling as dealers under the Chemists and Druggists Act?"—In reply: See the JOURNAL of September 18, in which we give an abstract of the Poisons Act.

J. B. J.—There is always very considerable risk of fog in such circumstances, the cut-off rarely being quite effective. However, Messrs. Thornton-Pickard, J. M. Turnbull (Edinburgh), and W. I. Chadwick, all make excellent slides of the kind you allude to.

DISSMISSAL.—ANXIOUS. We fear you have no redress, as you were a weekly servant, and were given a week's notice in due form. Had there been an agreement for a definite term, the case would be different, and you might probably have recovered damages for wrongful dismissal.

J. H. JONES.—1. We do not know; but probably Messrs. Dawbarn & Ward, Farringdon-avenue, E.C. 2. No doubt; hence you had better not copy without position. 3. If the copyright has not expired, you would be liable to an action if you copied the pictures. 4. The photographs are extremely good.

G. BRUCE.—Better place the matter in the hands of your legal adviser. You will find that, provided the copyright of the photograph is yours, the magazine in question will readily come to terms. Of course, with a valuable negative, such as this appears to be, you will not be content with trifling damages.

FADED PRINT.—FADING writes: "Would you kindly give your opinion of the cause of fading of enclosed print?"—With no data to go upon, it is impossible to give an opinion. The print is badly faded, and there are several causes that may have conduced to it, such as the mountant, the mount, or, what is more probable, faulty manipulation.

VARNISH FOR COLLODION NEGATIVES.—W. SHARP. Varnish for collodion negatives that are to be much printed from should have shellac as a base. Any of the lac varnishes given in the ALMANAC will be suitable. We cannot say the composition of the commercial varnish mentioned, but we have no doubt whatever that the principal resin in it is shellac, on account of its hardness.

ANOTHER SNARK.—We take it that what you wish to acquire is a theoretical and practical knowledge of half-tone work. In that case probably your best plan would be to attach yourself to the process classes of the Technical School, 6, Bolt-court, E.C. Mr. F. Donagan, the Hon. Secretary, will send you all particulars. If concurrently you could obtain a situation such as you allude to, so much the better.

A QUESTION OF LAW.—M. S. says: "Could you tell me if it is legal, if a private individual brings a photograph of himself or a friend to be enlarged (for instance, to make a bromide enlargement and finish in crayon), to sign your name on the enlargement like a painter does on a picture?"—In reply: A curious question to answer. However, we should say that, in all probability, it is quite legal.

PHOTOGRAPHING AT NIGHT.—MAGNESIUM would like to know what we would advise as the best way to photograph a fancy dress ball, which is to take place shortly in a large hall. "I should very much like to try this experiment if it is possible."—The best way, probably, will be to use a series of flashlights, fired simultaneously in different parts of the room, and in such positions that they are not in view of the lens—shielded from it.

STRIPPING GELATINO-CHLORIDE PRINTS.—"I have seen the article in THE BRITISH JOURNAL OF PHOTOGRAPHY of last week on *Stripping Powder* (antifoudre), and should like to know, through your Correspondence column, where it may be obtained. I am anxious to try the process, but cannot find any source of supply here in Liverpool."—In reply: See the note at foot of page 69 on which the article appears. A formalin bath of two per cent. is recommended in place of the "antifoudre."

STAINED ENGRAVING.—STAINS says: "I should be much obliged if you would tell me how I can best remove Prussian blue stains from the edges of engravings. The prints are otherwise stained, and will need to be cleaned with lime water, and perhaps a solution of soda. Should the Prussian blue stains be dressed before or after the general cleaning?"—It is quite possible that the bleaching of the engravings will at the same time get rid of the blue stains, which may not be actually Prussian blue. If they are not removed by this treatment, they should be erased afterwards.

COLOUR FOR STUDIO.—STUDIO writes: "You were kind enough a few weeks ago to answer a query of mine in your columns, for which many thanks. I will again trouble you. What colour would you advise me to paint inside of studio? I thought a light bluish pea-green, if there is such a colour. There will be a light in the studio. The roof is thirteen feet to apex, and it is only twelve feet wide. Would that be a good colour, or can you advise a better one?"—The colour suggested will do quite well, but we should not recommend it to be too light, as then it would be dazzling to the eyes of the sitters. Any quiet colour will answer.

STUDIO.—ENGLISH asks: "Can photographs (portraits) be successfully taken in a large room having a glass roof? It is impossible to get any light at the sides, as the walls of adjoining houses form them. One end points to the south, while the other end joins up to the shop. Is eight feet wide enough for a studio, and, if light of above is bad, can it be made suitable without altering structure?"—The light will be a very awkward one to work with, being all top and the studio very small. Its working capabilities would be improved by making it much larger. Eighteen feet is very short and eight feet very narrow for a studio for professional work.

BOOKS FOR PRESENTATION.—PHOTOGRAPHER says: "I am about to have a book presented to me, and I write you, hoping that you will extend your kindness and experience to help me in the selection of such a book as would be useful to me in my capacity as operator, retoucher, &c. If you would be good enough to trouble to send me a small list of works on photographic subjects, about 2*s.* 6*d.* or so, I should feel myself greatly indebted to you."—Our correspondent had better procure the list of Messrs. Iliffe, 3, St. Bride-street; Dawbarn & Ward, Farringdon-avenue; Percy Lund, Humphries & Co., Bradford, from which he can make a selection.

COPYRIGHT MATTERS.—INQUIRER asks: "1. Can a photographer have the borough arms placed on his mount without a licence? 2. Last week, in photographing an interior, the most prominent picture on the wall is a copyright photograph (size about 18×15). How does the Copyright Act come in here? 3. I hear Mr. Bennetto has sold his rights for 5000*l.*, and sold his business also. Is that correct?"—In reply: 1. We believe so. For example, the arms of the City of London appear on many commercial documents—letter-paper, bill headings. 2. We cannot say precisely, but should imagine that the Copyright Act might apply. 3. We do not know.

LIGHTNING.—Bigelow's *Album of Lighting* is the only work we know of suitable to your requirements. It is out of print, but a copy might be obtained by advertising.

COPYRIGHT.—TETA. The ownership of the copyright will depend upon the agreement between the Brighton firm and the local photographer, who is the author of the work. It does not vest in the sitter, as the portrait was taken at the photographer's solicitation, and was not paid for, as in the ordinary course of business.

REDUCING.—C. L. E. 1. From what you say, the negative requires but very slight reduction. In that case, the use of a very weak solution of potassium ferridcyanide should be resorted to, so that, in case it is seen, after immersing the negative in the hypo, that sufficient silver has not been dissolved out, the operation may be repeated.

COPYRIGHT.—COPYRIGHT asks: "1. I shall be glad if you will tell me if engravings in a book published in 1845 can be copied for lantern purposes without an infringement of copyright. 2. Also, would it constitute an offence to exhibit pictures in a modern copyright work by means of the aphengescope? In such a case there would be no reproduction in the ordinary sense of the word, but I am doubtful how the matter would really stand."—In reply: 1. Copyright having lapsed, you would incur no risk. 2. We think you would be liable for damages. In the "living picture" case, tried a year or two back, there was no reproduction in the "ordinary" sense, but the Act applied all the same.

COLLODION EMULSION.—PROCESS says: "Kindly reply to the following:—1. Would you advise making own emulsion for dry-collodion plates for process work in preference to buying it, the advantages over wet or gelatine plates being considerable (in our opinion)? but, the dry-collodion plates being so high-priced compared with wet or gelatine plates, we ask your opinion. 2. We use the Hill-Norris dry plates; they are bad for frilling. What is best for preventing this? Can you give us formulæ for making collodion emulsion? Also, how long it can be kept?"—1. If you make your own emulsion, you will, doubtless, find the plates coated with it cheaper than those you buy. 2. We have not found the plates named to frill. Try varnishing the edges before developing. Formulæ for emulsions are given in the ALMANAC.

STUDIO QUERY.—H. WAKEFIELD writes: "I am about taking premises on long lease, and propose converting a building at the rear into a studio, but am rather doubtful about the side light, a certain amount of which is lost by buildings obstructing it. I enclose rough sketch, which I think will explain the trouble. Would you advise a curved or sloping roof from A to B, as in sketch No. 1, without upright side light, or have the usual top and side light (sketch No. 3), in which case would ground glass at top and clear fluted (Hartley's patent) at the side be advisable on account of the obstruction? If sloping roof, what glass should be used to obtain best results?"—We do not think that the buildings shown in the sketch will materially interfere with the side light, as they are so far away. We should recommend the design shown in sketch No. 3. The proposed system of glazing will do quite well.

LENS. CARBON PRINTING.—D. M. says: "1. I should be greatly obliged if you would give me information as to the best form of copying lens for general use to buy—at least, the cheapest one for copying *cartes-de-visite* to cabinets and whole plates, and the probable cost. 2. Having lately seen one or two firms using, to me, a new kind of advertisement—opals, in the centre of which is a view of some kind, leaving the outer part of the opal clear for the name of their goods—and wishing to try some for my own use, say, a *carte-de-visite*-size head on view in the centre of whole-plate piece of opal, or larger or smaller, as the case may be, as long as I leave a good margin of clear opal (the ones I speak of I believe are carbon); if so, would you kindly inform me the best way to commence trying some myself, having never tried any carbon work?"—In reply: 1. The best lens, if price is an object, will be one of the "rapid" type or a triplet. 2. The pictures in question are, doubtless, made by the carbon process, which is admirably suited to the purpose. Space in this column is too limited to give details of working process. Better get the *Autotype Manual*, published by the Autotype Company.

STUDIO; SPOTS.—W. A. says: "1. As I am about to build a new portrait studio, I shall be very glad if you could give me a few hints as to the best way of going to work. I am thinking of building it of wood, with an iron roof, and lined inside with wood, but am a little puzzled to know what size to make it so that I can get Rembrandt effect, &c., and what shaped roof and pitch of roof, and size of skylight and side light, and how low down to make the side light, and the best arrangement of blinds, &c. Do you think a wooden studio would be the best and cheapest, or would iron be better and cheaper? A few hints would greatly oblige. 2. Also I enclose a print covered all over with white spots. I have been troubled with these beastly spots for some time, but can't find out what does it. Would blacks from a stove-pipe settling on roof and getting into the wash water cause them, or would dust of the floor, containing hyposulphite of soda, cause them?"—1. Twenty-seven to thirty feet long by twelve or thirteen wide will be good proportions, with about thirteen feet high at the ridge. Five feet at either end, top and sides, may be opaque, and the rest glass. The shape of the roof must to an extent depend upon the aspect. A ridge roof is a good form. Either wood or iron will answer. Possibly the former would be the cheaper, if the District Surveyor would permit it. 2. Dust from the floor is the more probable cause of the spots.

*** SEVERAL answers to correspondents are unavoidably held over.

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No. 1920. Vol. XLIV.—FEBRUARY 19, 1897.

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EX CATHEDRÂ.

RECENTLY, when in Liverpool, we saw hanging outside the offices of the *Daily Post* some framed bromide enlargements of undeniably good quality. An inscription apprised us that they were specimens of the crayon and Indian ink portraits that are said to cost, if ordered through artists, from two to three guineas, and which are being offered to the readers of newspapers for six shillings and sixpence. The idea appears to be travelling all over the country. Recently it was being exploited in London; we next heard of it in Devonshire and Cornwall; now it has been adopted in the north of England. Wherever it breaks out, however, local photographers draw our attention to it, and protest against the daily press engaging in this kind of competition.

* * *

SEVERAL letters from Liverpool have been addressed to us on the subject. A leading photographer in the town writes: "Is it not a subject that should be taken up by the photographic press? These enlargements are really good bromides, and are causing incalculable injury to the profession here. The *Echo* is one of Sir Edward Russell's papers, and is a most profitable undertaking, with an enormous circulation, and it seems to us wrong for a gentleman in his position to cause such injury to local photographers."

* * *

THERE can be no doubt that great harm is done to legitimate photographic business by these cheap enlargements. But, as has been many times pointed out, the newspaper proprietors and editors do not deserve the whole of the blame. The scheme, which is worked from a central source, with which we are quite familiar, is proposed to them as likely to increase the circulation of their respective papers, and adopted with that end. They do not concern themselves with, if even they are aware of, the harm they are doing professional photographers, by offering for six shillings and sixpence what is alleged to cost far more in the ordinary way; and, from their point of view, why should they? It may seem poor consolation to those photographers who are smarting under this severe competition, but we believe the only remedy for it lies in the production of work of such good quality as will enable them to ask and obtain good prices. Concerted action appears impossible; individual protests and indignation relieve one's feelings, but are otherwise useless. Good of their kind as these six-and-sixpenny enlargements undoubtedly are, they will not bear comparison with a really first-class, skilfully worked-up enlargement on bromide paper, which, according to our daily experience and observation, easily commands a good price.

* * *

IN our News and Notes column we publish an extract from the *Yarmouth Independent*, from which it appears that the arrangements for the Convention meeting next July have been somewhat delayed on account of the illness of the local Hon. Secretary, but that matters will probably be put in trim during the next few days. A perusal of the extract from our contemporary will show that there is a desire on the part of the Yarmouth photographers to leave nothing undone to promote the success of the gathering, which is being looked forward to with a great deal of pleasure in the town.

* * *

IN connexion with Mr. Cruft's Dog Show, which was held last week at the Agricultural Hall, Islington, there was an Exhibition of canine photography, which included some very good examples of this branch of work. We were immensely

struck by the productions of Mr. Herbert Mitchell. This gentleman, who had a series showing sporting dogs at work in the field, evidently devotes close attention to the subject; for there was a remarkable naturalness, realism, and truthfulness about his many excellent studies. The characteristic attitudes, the alertness, the attention, the intelligence, the movements of the animals are wonderfully well realised by Mr. Mitchell, whose canine photographs it is difficult to over-praise.

* * *

We publish elsewhere the annual report and balance-sheet of the Affiliation of Photographic Societies. It appears that a considerable number of societies are joining the Affiliation, and that the lectures are being extensively availed of. The not inconsiderable sum of 40*l.* appears to have been spent on the lectures, and we notice that three gentlemen intimately associated with a contemporary are among the lecturers, presumably paid. We do not suggest that this has been brought about by favouritism, but we go so far as to say that, where the disposal of money for services rendered is in question, the utmost care should be taken to avoid even the appearance of partiality.

* * *

The suggestion, which was originally made in our columns, that the Royal Photographic Society should hold a Technical and Trade Exhibition, has recently come before the Council, who have appointed a Committee to consider the matter. It is probable that the Exhibition, if decided upon, will be held in the early part of next year, it being felt that the trade should be given the fullest notice, so that the utmost time may be available for the preparation of exhibits. If the intentions of those who have given this question of a Trade and Technical Exhibition consideration are realised, a fine exposition of photographic industry should result.

* * *

Reference to the Affiliation reminds us that that august body, or rather its Chairman, Mr. Thomas, menaced us some time ago with the terrors of the Copyright Act. The circumstances of this most momentous case were as follows:—In October last a journalistic *confrère* read a paper before the members of the Photographic Club on *Pictorial Photography*, and courteously handed us a copy of the paper, with permission to reproduce it. The news of our intention reached the ears of the Affiliation, and the result was the dispatch to this office of an intimation that, as the lecture and the copyright therein were being paid for by the Affiliation, they could not "allow of its being used" in the manner proposed. Naturally we at once yielded to the immeasurably superior force of the Affiliation of Photographic Societies, and held over the lecture. We suggest to the Committee that, when the next series of paid lectures is arranged for, they be copyrighted—as are some plays—in a theatre or similar building, to which permission is only to be obtained on payment of 1*l.* 1*s.*, or some other prohibitive sum. Then shall we and others be entirely prevented from running such grave risks as those we just escaped last October.

STAINED FINGERS AND CLOTHES.

In the pre-gelatine days the subject inquired about by "Apprentice," as answered in the Inquirer column (page 92), was of perennial interest, stained fingers and linen and the practice of photography were convertible terms; but, under the modern style of working, there are many expert hands who do not even know the meaning of stained fingers. When, however, a learner, or even an experienced worker, does not work on the button-pressing system, he is bound to have experience enough to speak upon the subject. It will be worth while to devote a little time to the consideration of the cause, or the causes, and the remedies.

In working wet collodion without indiarubber gloves or special developing plate-holders, the fingers usually become simply black. This was usually put down as being "pyro stain;" but, though it is true the blackness usually accrued during pyro intensification, the blackness was, in the main, rather caused by deposited silver than the pyro itself, as is shown by its ready removability by silver-stain solvents.

The stains now more frequently met with, among amateurs especially, are, however, when a pyro developer is used, actual pyro stains, and are very difficult of complete removal. The best recommended plan in practice is to rub the fingers with moist chloride of lime, followed by a soaking with hypo solution.

But stains arise in many other directions not at first thought of. Thus one day pyro will stain, another day the fingers will be quite clean. This is explained in two ways. First, if a small proportion of ammonia be used, the liability to stain is much less than if the full maximum has been employed. Further, the use of a large proportion of sulphite in the developer reduces the disposition of the solution to mark the fingers. Secondly, stains on the fingers are very liable to be brought about if the hands be not quite free from other chemicals at the time. Thus, if, preliminarily to developing work, the operator has been washing prints, or even toning only, their immersion in the developer will quickly bring about a very deep-seated and fast stain, and in this connexion it may be noted how extremely difficult it is to free the fingers even by copious and repeated washings in clean water. If, for example, the bleaching powder be used alone, the hands may be washed in running water for several minutes without their being freed from the nauseous odour. For this reason it is that treatment with hypo solution is recommended to follow. Decomposition takes place, and the chlorine compound is "killed," and ceases to smell. All the same some chemical of another sort remains behind, though not perceptible to the olfactory organs. It is this obstinate retention of previous salts that leads to so many cases of stains from unknown causes.

Analogous to this is the action of a gold-toning bath into which, as sometimes happens, insufficiently washed prints have been placed. The fingers then take up another class of stain, best expressed by the familiar term "grubby." The minute lines and folds of the skin receive the stain, producing a dirty grey effect when the toning operations continue for some time. When large numbers of prints are in succession passed through the washing waters, silver stains of a similar nature are again produced. It need scarcely be said that modern P.O.P. and that type of paper is far less liable to produce the effect we speak of than home-sensitised albumenised papers—another gain for modern workers. The deepest stains of all are naturally produced during this home-sensitising of paper. Splashes and handling the paper after sensitising render the deep-brown stain inevitable, and very tough to remove.

The handling of chloride of gold or its solution will give a purplish stain of reduced gold, which nothing but strong

cyanide solution will remove, except, perhaps, rubbing with sulphide of potassium, which is too nauseous to contemplate.

Having thus lightly touched on the main causes of stains, their prevention and removal naturally call for attention. The use of indiarubber gloves or mittens is better than anything, and it is astonishing how, in practice, the mittens, without fingers, can be used with ease and comfort. We know some workers, on a large scale, who use pyro only as a developer, yet who never have a stain on their hands. It is often said that such kind of work is like a cat in mittens, but we are credibly informed that, by continued use, the wearer even forgets that his fingers are confined at all.

We should be loth to suggest that any particular developing agent should be discarded in lieu of another on account of its staining properties; but, where absence of stain is looked upon as necessary, we need only instance metol, which is as free from, as pyro is liable to, the effect complained of; but, even with metol, the fingers must not have previous silver contamination, or its good character will be lost.

Finally, as to the removal of stains. We have already suggested the means to employ for true pyro stain, and there remains to consider silver stains in all their variety. For this purpose, whether for fingers or clothes, we are informed by a contributor of forty years' constant practice in all kinds of photographic work that there is one remedy before all others, as follows: Let a strong stock solution be made (kept in a stoppered bottle) of iodine dissolved in water by the aid of iodide of potassium, say, a quarter of an ounce of iodine and sufficient iodide to dissolve it in an ounce of water. The stains should be painted with this solution, which must be allowed to remain for, say, half a minute for its action to be complete. The stain is then converted into a dirty pale yellow, masked by the brown of the iodine. Cyanide solution will at once remove the brown, and, after a while, the dirty yellow hypo solution will do the same, but more slowly. Some photographers have a great objection to cyanide in any form, and others do not like to contaminate their fingers with hypo. These can be accommodated by following the iodine with ammonia, which destroys the brown, but leaves what is sometimes an almost invisible yellow.

For linen cuffs and collars, &c., the iodine and cyanide is a perfect stain-remover, but it is necessary, if the marks are deep, to use a sufficient quantity of the iodine to ensure, as may be done, the entire removal of every argentic trace or mark.

Acetylene.—Whether or not acetylene will ever become largely utilised remains to be seen, but clearly many are sanguine about it, as witness the number of patents applied for. Between October 1 and December 31, last year, over sixty patents were applied for in connexion with acetylene and its production, application, &c. Since then the numbers have been increasing rapidly, sometimes at the rate of a dozen in a week.

Sunlight during Last Quarter.—It is curious to note the average sunshine, as recorded in the report recently issued from the Greenwich Observatory. It appears that in the three months there were 122·7 hours of bright sunshine, this being but 14·7 per cent. of the total hours during which the sun was above the horizon, the mean proportion for the corresponding quarter for the last nineteen years being 16·6 per cent. It seems that during October the duration of bright sunshine was 17 per cent. below the average, and, in November, 19 per cent above it, while during December it was no less than 56 per cent. below it for that month. Photographers in the metropolis scarcely require reminding of the light, or rather absence of it, during December last, particularly those who had orders to execute before Christmas.

New Art Gallery.—The building of the new Gallery for British Art at Pimlico is proceeding apace, and it is expected that it will be ready for opening early in the summer. Already the interior is so far completed that the heating apparatus has been set going, so that the walls may be thoroughly dry before the pictures are put upon them. Wires for electric lighting have been laid throughout, but the actual illumination of the building and provision of the lamps will be left for the Government when the Gallery is taken over. There is an electric main on the outside, so that the current can be obtained from that source if desired. This will be an addition to the art galleries of London, and we can well do with more. Considering its size, the metropolis is very badly off for public art galleries. It is gratifying to see that provision is being made in the new building for electric lighting, so that there need be no necessity to close the Gallery at dusk, as is now the case with the National Gallery, Sundays as well as week days.

Dangerous Criticism in Germany.—A report has appeared in some of the daily papers which, if true, will take English people by surprise. It is, that a woman has been sentenced to a month's imprisonment with hard labour, at Magdeburg, for criticising unfavourably the appearance of the German Empress. The culprit said the photographs and prints that were published were not like the original, and that the Empress looks coarse, while the photographs make her look pretty. The report adds that the sentence has caused considerable excitement in Magdeburg, since it is considered that there was nothing in the criticism that was of a criminal character. If what this unfortunate critic said was true, it is very clear that the retoucher had been at work on the negatives, the same as is the case with all portrait negatives nowadays, whether of Royalty or not. Any how, the criticism, as alleged, is nothing but what one so frequently hears from ladies when expressing opinions on new portraits of their female friends. In England we are pleased to say that adverse criticism on the personal appearance of any of our Royal Family, if any one was so discourteous as to utter any, would not be visited with the one month's imprisonment with hard labour. But perhaps the report, after all, is only a *canard*.

Picture Sales.—There have been several auction sales of paintings and engravings lately, but the prices obtained at them have been by no means exceptional except in the case of one or two of the latter. Last Friday, at Messrs. Puttick & Simpson's rooms, a pair of small tinted prints, 12×6, *Mrs. Jackson*, and *Mrs. Tickell*, after Cosway, by Condé, was knocked down for 108*l*. This, it is stated, is the highest price this pair of prints has ever realised at an auction sale, though they are much sought after by collectors. At the same sale a set of four prints in colours, *The Deserter*, after Morland, by Keating, fetched 54*l*. The prices that other prints made at the same sale, though by good men, were not at all extravagant. At the sale of the late Baron Hirsch's pictures, the week before, at Christie's, a painting by Vandyk, *A Portrait of a Boy*, realised 1600 guineas. A Gainsborough, *Lord Musgrave*, from the Mildmay Collection, which was exhibited at Burlington House in 1879, sold for 700 guineas. This sale, which consisted of sixty-five lots, mostly by well-known artists, realised something less than 7000*l*.

A Battle of Processes.—The last meeting of the Edinburgh Photographic Society was an interesting one, the chief business of the evening being a discussion on printing processes. Mr. R. Ayton championed the platinotype process, and claimed for it that no process had done more to advance the artistic and pictorial side of photography than it had. Mr. J. B. Johnson did yeoman service in the cause of carbon, claiming for it that it is the best of all printing processes, as it is one that is capable of yielding any result that may

be desired; also that anything that could be obtained by any other process could be obtained equally as well in carbon, and there was no advantage in the use of a multiplicity of processes when one would give any result that could be wished for. Mr. F. P. Moffatt pointed out what he considered the advantages of matt gelatino-chloride paper, which gave prints very like platinotypes, and at the same time were very artistic, as well as, he thought, permanent. We were a little surprised to see that collodio-chloride paper, the use of which is greatly extending in the north, did not at the meeting find an advocate. We know that some of the leading men in the modern Athens use it extensively in their practice.

Discussions such as this are very valuable when undertaken by practical workers who are in no way commercially interested in the manufacture of the materials used, as they tend to dispel erroneous ideas as to the limitations of various processes. For example, there is a very general impression that good platinotype prints can only be obtained from strong negatives; but Mr. Ayton showed two prints from a thin negative, the one on platinotype paper and the other on gelatino-chloride paper, the one being quite as vigorous as the other. Secretaries of societies always have a difficulty in finding pabulum for their meetings, and discussions of the character of the recent one at Edinburgh, when confined to practical and uninterested workers, will always be alike interesting and valuable to the members, and at the same time upset many preconcerted notions as to the limitations of processes and methods.

JOTTINGS.

The Council election of the Royal Photographic Society could hardly have surprised many persons; but it was a bitter disappointment to several. Certain strenuous efforts to turn out some members of the old brigade proved quite futile; and some would-be councillors were deeply chagrined at not getting in. There was as much wirepulling as would suffice for a municipal contest. Oddly enough, the new men—Mr. Ives, Mr. A. Spiller, Mr. Snowden Ward, and Mr. Pringle—hardly lifted a finger in their own cause, and yet they thrashed other candidates who for weeks had been touting for support. However, matters are now settled for another year; but there are distinct signs that the bitterness of feeling which characterised last Tuesday week's contest will be just as strong in 1898; nay, I hazard the prophecy that next year there will be a far fiercer fight.

In the mean while it is instructive to glance back at the writings of some of those who interested themselves in the election just concluded; if they do not betray bitterness of feeling, I am no judge of language. From a small pile of cuttings a correspondent has been good enough to send me, I select the following letter, which appeared in a contemporary:—

"It can hardly have escaped notice that two of your weekly contemporaries have, of late, contained frequent editorial references to the Affiliation scheme of anything but a friendly nature, and it may be worth while, in view of the election of officers for the Royal Photographic Society, to remind country members, who may be also members of affiliated societies, who are and who are not their friends. The editors of the two journals, which I need not name, who are responsible for the frequent slating and ridicule to which the Affiliation scheme has been subjected, are, I believe, at present members of the Council of the Royal Photographic Society, and, whilst they may be desirable candidates from other standpoints, it may be well, as far as possible, to provide for a balance of opinion on the Council of the Society, towards whose revenue the affiliated societies are called upon to contribute.

"I ask you, sir, to insert this letter with the more confidence as I know you do not stand as a candidate for election yourself, and, moreover, have always shown a kindly interest in the provincial societies, and have encouraged the extension of the Affiliation."

This letter, which is amusing and contemptible in about equal proportions, was the anonymous production of a person who was an unsuccessful candidate for a seat on the Council. Evidently the electors to whom he appealed did not share his fear of criticism, and so Mr. Bedding and Mr. Wall were elected; still, what unutterable meanness of spirit the letter exhibits, to be sure!

But, for sheer bad taste and disloyalty, the following four extracts from the writings of another reforming angel would, I think, be difficult to beat:—

"If agitation is ever to be permitted, it may be allowed at the present time in the R. P. S., on the much too numerous Council of which there are one or two tedious old members; it would be worth not only the alteration of a few rules, but a whole living gale of revolution, to get rid of. I am afraid my faith in the Society and its future has become slightly weakened during the last five years."

"I am told by one of those members of Council of the R. P. S. who consider that the proceedings of that serio-comic body should never be mentioned."

"Whatever the people who talk proverbs may say, the onlooker does *not* always see the most of the game. This is especially true of the R. P. S., which at the present moment, I am told, is a hotbed of unseemly intrigues, beyond the limited understanding of almost quite everybody. It is supposed that it is such a mix-up that nobody knows who is his own leader or follower. I reiterate, let us have a new lot."

"I believe I am perfectly correct in saying that nothing new has been issued to the world for the first time at the R. P. S. for many years. The real Royal Society, the Camera Club, under Captain Abney, who has lately disapproved of the *other* Royal Society, is usually the medium of communication of the newest things."

Though the paragraphs I quote are headed by a *nom-de-guerre* they are "signed all over," as Mr. H. P. Robinson once said, and their authorship is no mystery to those most interested in the matter. And who do you think is responsible for this stream of unprovoked spitefulness? Not either of the open and avowed foes of the R. P. S. Mr. Robinson, Mr. Davison, Mr. Maskell, or Mr. Hinton, but a member of the Society, and one of its Council! I am surprised and sorry that the author should permit himself to use his pen so unworthily; and I suggest that for the future it might be put to uses in which accuracy, charity, and dignity played more conspicuous parts.

The mysterious colour-photograph process of M. Chassagne has set numerous pens—"expert" and otherwise—at work, and the general result, so far, has simply been a qualified admiration of the results, and an entire lack of explanation of how they are produced. If aniline colours are employed, it will be interesting to note whether they remain unaffected by light. Being applied to the surface of the photographs, they probably enter into combination with the albumen or gelatine of the prints and transparencies, much as they do with the gold-toned or developed silver images, possibly more so. I am writing in sight of some photochromes produced by the Zurich Company—which, though simply mechanically coloured photographs, will be difficult to excel for richness of effect by M. Chassagne's staining process. By the way, what an excellent advertisement the daily papers gave M. Chassagne! I am wondering if Dr. Selle, whose reinvented three-colour process was so unmercifully attacked the other night at the Royal Photographic Society's meeting, would not have done better had he avoided Hanover-square, and sought an interview with some Fleet street editor on the look-out for a cheap sensation?

The gentleman—or lady—who, according to the paragraph on p. 197, wrote to the Bristol press complaining that the photographs of actresses exhibited in the shop windows do not conceal the lines of their figures, and who bases upon that text an hysterical denunciation of the sitters, the photographers, and the shopkeepers, is surely too nice-minded for any part of the world outside a Sunday school. Some years ago there was a correspondence in the *Times* on the nude in art, and, in reply to some persons who affected to be shocked at the representation of the human figure on canvas, one writer

ffectively retorted that, if anybody was to be censured in the matter, ; was the Maker of the human form! If it is wrong to take and xhibit a photograph in which the lines of the human figure are hown, surely paintings, sculpture, and drawings, which include ıch subjects, must be also condemned, and thus half the art of the rorld for centuries deserves in some minds to be placed on the *ndex!* But I take it that no wholesome-minded person sees any- ıing wrong or inadmissible in the photograph of a prettily figured ctress, while at the same time he does not hesitate to condemn the rurient, suggestive, semi-indecent photographic productions which ɔo often find their way out of Holywell-street. I should not be ırprised if the author of the letter referred is not one of those articular people who detect indecency in the bare legs of his— iano, and so covers them up, as certain saintly beings are alleged ɔ do in America! COSMOS.

THE METHOD OF TESTING A DEVELOPER.

II.

APTAIN HOUDAILLE'S method of working is to obtain, on a gelatino- romide plate of a certain sensitiveness, a series of impressions ɔrresponding to luminous intensities ranging from 1 to 48, and ıeasuring the opacities of each tint, and constructing, point by oint, the curve of the opacities. If this curve is a straight line, the pacities are proportional to the intensities, and, in this case, the egative is complete and harmonious. If the curve is convex, the alf-tones have been sacrificed to the benefit of the two ends, and the egative is hard. If the curve is concave, the contrary is the case, ıd the negative is flat and monotonous. Very few of the formulæ ıd developers withstood the test, the majority did not give the ecessary opacity, others sacrificed the half-tones.

The apparatus used was very simple, and consisted of a printing ame, with a board pierced with twelve holes. These holes were ɔvered by sliding pieces. The plate was placed in the frame, and xposed to a candle placed successively at 2, 1, and 0·5 metres. The rst hole of each row was exposed thirty seconds, the second twenty conds, the third ten seconds. It is obvious that the nine holes xposed received a quantity of light represented by the numbers—

1, 2, 3,	4, 8, 12,	16, 32, 48,
Group of black tones.	Group of grey tones.	Group of white tones.

evelopment was effected with the developer to be tried, and evelopment stopped when the ninth hole was distinctly visible on ıe plate.

To measure the opacity, a transparency was printed by exposing ıis time the fourth series of holes for five, ten, and fifteen seconds ɔ a candle placed at two metres, giving the second series the same xposure as the first.

It is obvious that, if the opacities could be represented by the ımbers 1, 2, 3, 4, 8, 12, 16, 32, 48, ıe nine tints should be of equal value.

Such a result was not always seen, and it is easy, in comparing ıch tint, to determine for each the value of the absolute opacity, ıen that of the relative opacity; and, by taking as abscissæ the ıminous intensities one can construct, point by point, the curve of ıe opacity. The continuity of the curve enables one to correct ıe slight errors of observation. In order that the results shall be ɔmparable, it is necessary to use the same emulsion, and to work at ıe same temperature, 15° C. for example.

When a negative is developed one can see that the high lights ɔpear first, and that the details show successively in the order of ıeir intensity of luminosity.

In trying to determine the relation which exists between the ıration of appearance of the image and the luminous intensities, aptain Houdaille has discovered a very curious law.

When the ratio of the intensities is 16, the ratio of the duration of ıe appearance of the image is 2, and generally this duration is versely proportional to the fourth root of the exposure.

In a normal subject represented by the intensities 1238 ... 48, it possible then for one to forecast the time of the appearance of the different parts of the image. The following table was calculated by taking 100 seconds for the duration of the appearance of the high lights:—

Intensities. Absolute.	Relative.	Time and appearance.	
120 candle metre seconds	48	100 seconds	Group
80 „ „ „	32	110 „	of
40 „ „ „	16	130 „	high lights.
30 „ „ „	12	141 „	Group
20 „ „ „	8	156 „	of
10 „ „ „	4	186 „	half-tones.
7·5 „ „ „	3	200 „	Group
5·0 „ „ „	2	221 „	of
2·5 „ „ „	1	264 „	shadows.

It is possible from this table to deduce a practical rule sufficiently useful to determine the duration of development.

This rule consists in noting the time of appearance of the high lights and multiplying this number by 3, and withdrawing the negative from the bath some seconds before the expiration of this time.

This table, which has been tested with most of the developers and for exposures of varying times, proves that the time taken by the image to appear, multiplied by 2·64, will give all the details, and there is no gain in allowing the negative to obtain too great an intensity, which would diminish the value of the relative opacities.

This rule allows one to represent the rapidity of the action of the developer by a number which one may call energy.

We measure the energy of the developer by the time in seconds necessary for the appearance of the action of a candle placed at the metre distance acting for one second.

Every modification in the temperature and in the composition of the formula may alter the energy within wide limits; the nature of the emulsion and its thickness also play a considerable part.

Starting with a normal developer and a Lumière plate, blue label, at a temperature of 15° C., Captain Houdaille has found the following figures:—

Normal developer.

Water	1000 parts.
Sodium sulphite anhydrous	50 „
Sodium carbonate	100 „
Hydroquinone	15 „
Potassium bromide	1.5 „

Developer.	Energy.	Remarks.
Normal developer	246	Good negative.
Double strength	144	Foggy.
Half strength	500	Thin negative.
Normal without bromide	124	Fogged.
„ double quantity of soda	180	Hard.
„ double quantity of sulphite	220	Thin negative.
„ hydroquinone 20	180	Hard negative.
„ kept for a month	350	Thin negative.

This table shows, first, that the energy of a developer is sensibly proportional to the degree of concentration; second, that one ought to avoid keeping for any length of time a developer which contains bromide.

It is advisable, therefore, to use separate solutions, and not to keep a bath more than twenty-four hours when it has once been used. Without this precaution one must work by chance, and it is impossible to obtain negatives of equal value.

Starting from a given formula, that of M. Ottenheim, Captain Houdaille has arrived at a formula which he calls "Normal developer with hydroquinone." It is prepared in three separate solutions, of which equal parts are mixed just before use.

1. Hydroquinone	15 parts.
Sodium sulphite	50 „
Water	333 „
2. Sodium carbonate	100 „
Water	333 „
3. Potassium bromide	1·5 „
Water	333 „

Testing these solutions in various strengths, the normal bath was

found to act like the theoretical developer at the same time the shadows were sacrificed to the benefit of the high lights. The developer had a tendency to increase the contrasts.

With the concentrated and dilute baths the contrary was seen; the negative was nearly uniform, and it is shown that, to obtain a vigorous negative, it is useless to go beyond 15 parts per 1000. The maximum effect in opacity was obtained with about 13:1000, and this should not be reduced below 7:1000 if it be desired to obtain a negative which shall be useful for printing on paper.

It was also found that, according to the dilution of the bath, the development might take from three to ten minutes and more. With the normal developer the duration was about five minutes, and the high lights appeared in about sixty-five to seventy seconds for a time exposure.

Captain Houdaille's trials enabled him to answer to some extent a question which has been rarely satisfactorily answered, Within what limits may the time of exposure be varied? A plate cut in four was exposed in the ratio of 1, 10, 20, 100; 1 represented the necessary time of exposure to obtain a perfect negative. With the same plate and the same developer each exposure gave a different result. According to the nature of the subject, and the negative which one wished to obtain, there is one exposure which is preferable to all others. Practically, the time of exposure may vary from 1 to 20 without causing any appreciable difference in the negative. One can also obtain a useful negative when the exposure varies between 1 and 80. Beyond this the developer must be modified. The most harmonious negative may be obtained with an exposure about ten times the minimum exposure. It is impossible to separate the study of the developer from that of an emulsion; but it has been proved that the normal hydroquinone bath is suitable for all plates.

From the above consideration, Houdaille comes to the conclusion that it is possible to forecast the effect obtainable with a negative if the exact composition of the developer is observed, and the rule for the arrest of the development. With exposures varying from 1 to 20, it should be possible to obtain a series of negatives of the same intensity, which is obviously of great advantage from the point of view of printing on paper.

The simple addition of water to the normal bath enables the effect of contrasts to be altered at will, if one wishes to obtain an effect of sunshine or an effect of mist.

There is, of course, a big field open to any one to take up the study of this subject with pyro, metol, amidol, and pyrocatechine, &c., and Houdaille is convinced that there exists with each developer a normal formula, from which one need not depart much if a plate has been fully exposed.

When these researches are finished, the formulary of the practical photographer will be considerably simplified, and it will be possible to tell in advance which formula one must employ to obtain a particular effect, and empiricism will give way to reason.

M. CHASSAGNE'S COLOUR PROCESS.

A Possible Explanation.

Though I have not seen any of the results of the process of M. Chassagne, and can only judge by the published descriptions, I seem to recognise it as an old friend in a new disguise, though, I must say, never assuming the parti-coloured coat before. I may be mistaken, and may do the inventor an injustice, in supposing the method I am going to describe as the basis of that which he adopts; but, even if my theory is correct, there is all honour due to him for a very clever adaptation of a chemico-physical effect, which ought to be well known, but which is so often forgotten, that almost every year the idea is repatented.

It is now nearly sixteen years ago that Captain G. Pizzighelli, in the course of some experiments, undertaken by Dr. Eder and himself, on the use of potassium bichromate in the dry-plate process, discovered some remarkable properties in gelatino-bromide plates treated with bichromate. Amongst other things it was found that a negative placed in a solution of potassium bichromate, dried and exposed the reversed side to the light until the picture was faintly visible on a piece of silver paper in contact, possessed after washing a new characteristic. The transparent parts of the negative became horny and not affected by aqueous solutions, whilst the dark parts in immediate contact with the glass were rendered insoluble though they retained their power of swelling up, and therefore remained liable to be acted upon by any solution. This property was taken advantage of for intensifying purposes. The negative thus prepared could be treated with the ordinary pyro-silver intensifier of the collodion process without fear of the transparent parts being stained. The action of the intensifier was indeed proportionate to the absorptive power of the film, and this was in the same ratio as the original light action (*Photographische Correspondenz*, 1881, p. 43).

It was further found, and described in a later issue of the same journal that a gelatine negative treated in this way possesses generally the same properties as a collotype plate, and that fatty ink could be applied and an impression taken in the usual way. The means adopted to render the plate more adapted for this purpose need not be here described, as they are not important in their bearing on the subject in hand.

Before considering the applicability of this idea to colour photography I may call attention to the numerous processes which are based on the discriminating hygroscopic properties of gelatine treated with bichromate; for instance, the powder process used in photo-ceramics. Quite recently I was in conversation with a gentleman who claimed to have a colour process in which the colours in powder were simply dusted on to the paper or plate, which took up the requisite colour in different parts corresponding to the colours of the original. I think I can see that, if a light blue colour was applied first is would "take" all over, drying up the lightest parts, which would naturally be blue, but leaving a darker tone still tacky. Now, if green was next applied, it would not "take" on the light parts, but in darker tones the tackiness would still exert its effect, allowing the green to more or less cover the blue. Next a red powder is applied, and, whilst not covering the light blue nor the shades of green, would be attracted by the red shades being naturally darkest and most hygroscopic.

If we substitute dyes for the coloured powders, we appear to be very near to the fundamental principles of M. Chassagne's process. In the same way, if in place of the intensifying solution in Pizzighelli and Eder's process we can apply dyes, we nearly account for the statement that in Chassagne's process an ordinary plate prepared in a certain way (*i.e.*, probably by some treatment with bichromate) is used. What is applicable to a gelatine film on glass is equally applicable to a film on paper.

Of course, there are various difficulties which present themselves against such a theory; for instance, the primary difficulty of the first-applied dye washing out, and combining with the second and third; but these are troubles which M. Chassagne has apparently solved. I have not had the time, nor have I the facilities handy, for putting my theory practically to test, but I hope the hints I have given will lead readers to experiment on these lines, for, even should the theory be an incorrect one, it seems to offer a promising field for a three-colour process. I strongly incline to the belief that M. Chassagne's method is somewhat analogous to collotype. Workers in that process know how readily the plate can be altered in its absorption for water or attraction for ink; for instance, by the application of glycerine, alcohol, ammonia, cyanide, hypo, nitrate of lime, &c., some making it less and some more hygroscopic. Some substances affect the film in the high lights, other things affect the half-tones, and a third class affect the shadows. Some such substances might be incorporated with the dyes in this new process. The use of what Captain Abney describes as a "mordant, in the shape of a colourless liquid, containing, I should say, albumen and salt," seems to suggest something of the nature of a collotype damping or "etching" solution. The statement that the colouring must take place in good daylight suggests bichromate.

It may be urged that in a positive gelatine image the absorption of dye would be greatest in the lights where the gelatine was least hardened; but this is actually not so, as I have proved by taking a piece of Warnerke tissue and developing it with pyro-ammonia, which, as is well known, produces an effect analogous to a bichromated film. A wash of blue dye appeared lightest in the lightest parts. Of course, this could only be that the colour of the image deepened the colour of the dye stain, but still it goes still further to account for M. Chassagne's process.

Again, Captain Abney does not seem able to account for the use of a specially prepared negative. May it not be simply an orthochromatised plate; or, if this is not so, is it not possible that the staining of the film with bichromate makes it, to some extent, orthochromatic? Is the transparency made from plates out of the same box? seems a pertinent question.

Captain Abney further says that the print is made on a specially prepared albumenised paper, which seems to upset the idea of bi-

romated gelatine; but gelatine can be combined with albumen to m a tougher film than gelatine alone, as in some photo-litho nsfer papers, and in the fish-glue process, without losing its dis-minative absorption qualities.

On the whole, judging from the published description, I see nothing ry contrary to my theory that it is a process analogous to collotype, d somewhat on the lines of Pizzighelli and Eder's discovery. Or it ay be on the lines of Warnerke's process. To identify it with the latter, would be interesting to know whether the pyro-ammonia developer was ed, or whether the paper positive was developed at all.

Whilst on the subject, I may suggest that my theory also seems to fit with Mr. Wallace Bennetto's process. True he says he uses no dyes, t it is not difficult to get developers, intensifiers, or toning solutions hich will render approximately the three primary sensations of colour, d he might apply them in some way as Eder and Pizzighelli applied e intensifier. But Mr. Bennetto says there is no silver image visible. hat, however, is not a difficulty, for the gentlemen above named scribed how to remove it, and still leave the plate with all its absorptive haracteristics. They transformed the image into silver chloride by a eaching method, *i.e.*, by applying a solution of 1 part of bichromate potassium and 3 parts of hydrochloric acid in 100 parts of water. The ate was then well washed and again fixed, which has the effect of ssolving all the silver chloride and leaving the film transparent.

As Mr. Bennetto has not said that he does not use three films, and as me one else has said for him that his process is no more trouble than aking a collodion positive, I incline to the belief that his process is not clever as I have given him credit for, and that he may only coat a ate with collodion emulsion, develop, fix, and colour it, coat the film ith a waterproof varnish—*e.g.*, indiarubber—and again coat with nulsion, print, develop, and colour, repeating operations for the third lour. This would, of course, presuppose three negatives made through itable colour filters, and an exact registering arrangement in the inting frame.

I think that these two much-talked-of colour processes will be found have some features in common with what I have described, but, if I m mistaken, I offer these ideas as suggestions to experimenters in colour hotography, having no ambition myself to work them out and sell em to a syndicate.

WILLIAM GAMBLE.

A NOVEL METHOD OF COMBINED CLEARING AND INTENSIFICATION.

t is perhaps rash nowadays to apply the term "novel" to anything in onnexion with photography, but the process about to be described resents certain features which appear to warrant the application in this ase. The method has been more especially tested in connexion with hat are known as "process" negatives, both in line and half-tone, nd chiefly with collodion, though it appears to answer equally well with elatine, if the fact of silver intensification being used does not, with any operators, place it out of court for that purpose. We are bound to dmit that silver intensification, as applied to gelatine plates, involves considerable degree of care; but, when properly worked, the results re, we think, better than can be obtained by any other process. So ar, we have not tried it with negatives in natural half-tone, so are carcely in a position to say whether it works satisfactorily for that class f picture.

In the method of intensification itself there is really nothing new, ince it is only the ordinary pyro and silver process employed from ime immemorial with collodion plates; nor, so far as that is concerned, s the clearing solution itself novel, though it is rarely, if, at all, used. But in the combination of the two a novel point arises, which we, at east, have never seen mentioned before, namely, that the intensification of he deposit and the clearing of the transparent portions of the negative pro-eed simultaneously. We were led to the discovery of this curious cir-umstance in the following manner.

Having occasion to intensify a line negative, we proposed to do so by ompletely bromising the image, *i.e.*, converting it into bromide of silver nd redeveloping with alkaline pyro, followed by silver intensification, a nethod which we have often found successful when other plans have ailed. For the purpose of conversion, we improvised a bromising olution by gently heating together equal parts of nitric acid and romide of ammonium with a little water until the bromide was iberated. Upon applying this solution, diluted with water, to the egative to be treated, the image was very slowly changed to a greyish white and somewhat metallic colour, quite unlike the appearance roduced under similar conditions by bromide of copper; and, after a very protracted application, it failed to penetrate the film completely in the densest portions of the negative. However, as we concluded that these portions required less intensification than the rest, we proceeded. It occurred to us to apply the pyro and silver first in daylight, to see if it were possible to build up a silver image of any value before reducing the bromised image with alkaline pyro, but, to our surprise, beyond a very slight alteration in the surface colour, not the slightest effect could be produced *except on those portions where the bromising solution had failed to penetrate.* Here intensification proceeded in the usual manner, producing the very opposite result to that desired, namely an increase of density where it was least required.

This was a sufficiently curious state of affairs to deserve further investigation; we concluded that the bromised image must have taken on *some* silver, even in the parts that showed no signs of intensification So, to enable us to judge if such were the case, the negative was "fixed" with cyanide, when every vestige of a picture disappeared, except those portions, where as already recorded, the bromising solution had failed to penetrate and intensification had taken place. These portions, which represented the highest lights of the engraving copies, remained of full printing density, while the rest of the plate was clear glass.

We naturally repeated this experiment with sundry variations, the outcome of which was the discovery that wherever the image is completely converted by the bromising solution into whatever compound of silver it may be—for we do not think it is bromide—absolutely no effect accrued from the action of the pyro and silver, and very little from alkaline pyro. But, where the effect of the solution is only partial, intensification goes on in the ordinary way.

To come back to the title of our article, the way this process works in practice is as follows: We will take a collodion negative of a line subject, and if the transparent lines are not perfectly clear, or nearly so, we give a slight wash with the bromising solution, followed by one of cyanide, simply as a *clearer.* It is not needful at this stage that the lines be absolutely transparent; for the sake of experiment it is, perhaps, preferable that they are not; but, whether or not they are free from visible deposit, the next operation will fill them up with an opalescent deposit of some kind that would lead to the supposition that they had been rather badly veiled.

The next operation consists in applying the bromising solution, in a rather dilute state, until the transparent portions are full of the opalescence mentioned, and the whole surface exhibits a slight "bloom," showing that the solution has acted generally. At this stage the colour by transmitted light has become browner, which gives an appearance of greater printing value. The negative is then thoroughly washed.

Now, to apply to the image in this condition and in broad daylight a developer of pyro and silver would appear to be best possible way of filling up the transparent lines, but that is just what does not occur. As soon as the pyro and silver is applied, a change commences, and the density begins to increase much more rapidly than under ordinary conditions, that is, at least, where any deposit of silver exists, but the lines remain clear, even the opalescence becoming less prominent as the action proceeds, which it will do until the image is almost opaque. If the film be now washed, it still presents the "bloom" it had before intensification, and the image is dull and buried; but, on the reapplication of a solution of cyanide, the dulness and bloom clear away instantly, and the picture stands out bold and clear as a glass positive, without any loss of the freshly attained density, but with the transparent lines clearer and sharper than before the treatment.

The curious circumstance is that, if the treatment be repeated, as it may, time after time, the transparent portions, however clear, are invariably rendered opalescent, and each reapplication of the cyanide "cuts" more and more into the finer details, though with far less "raggedness" than would be the case if the iodine and cyanide method were used.

We do not at present attempt to offer any definite explanation of the working of the process or what is the action of the bromising solution. Its composition even is open to much doubt, but it probably contains at various times free bromine, hydrobromic acid, together with the bromide of nitrosyl, which, like the chloride in the case of aqua regia, we may suppose to be formed by the combination of the free bromine and nitric oxide. At any rate, this solution, like the corresponding one made with nitric acid and salt, behaves entirely differently upon a negative image to one of aqueous bromine, or chlorine, or even to a dilute solution of aqua regia.

Some years ago the solution formed by the action of nitric acid upon common salt was mentioned in these columns as a useful clearing agent

for the flat over-exposed—or, as they were termed, "burnt-up"—negatives then so frequently met with. It was pointed out that its action differed from other bleaching solutions, such, for instance, as chloride of copper, in that it went through the thin shadows of a negative with comparatively little action upon the high lights, and thus produced in the class of negatives referred to the contrast they lacked. This action was set down at the time to the aqua regia, formed by the reaction; but aqua regia, made from the mixed acids, does not produce a similar result until it has become thoroughly decomposed, either by age or heat. The effect is more probably due to the chlorides of nitrosyl already mentioned, which are amongst the products of the decomposition. We may add, that the solution of common salt and nitric acid acts equally as well in intensifying as the one of bromide.

The peculiar clouding of the transparent lines remains to be explained. We were at first inclined to attribute it to the decomposition of some soluble silver salt left in the film through imperfect washing after the cyanide, but the most prolonged washing we have given fails to arrest it. It is more likely, we think, to be the result of the solvent action of the bleaching solution on the silver of the image; but, whatever it may be, it appears wholly inert.

We see no reason to doubt the applicability of this process to negatives in natural half-tone, though we have not tried it yet for that purpose; but we think it will prove of great use for line and screen negatives, especially the latter, as its cutting action is cleaner and more under control than that of cyanide and iodine.

PHOTOGRAPHING BEAUTY.

It is a well-known fact that there are words which, like trumpets, cymbals, and basedrums of mountebanks, never fail to attract the public attention. The words, "beauty," "glory," and "poetry," are three which have certain witcheries that do not fail to seduce the grossest minds. It may be due, then, to this curious fact that I, after penning a few words to a contemporary on the subject that heads this paper, received numerous letters, abusive and complimentary, from various photographers; some asking for further particulars, others summing up the whole thing with "There ain't no such thing as beauty nowadays." One of my correspondents, who I believe to be a confirmed old bachelor, wrote: "If young photographers wish to rise in the world, they must steer clear of 'muslin.' A pair of sweet lips, a small waist, a pressure of two delicate hands, will do as much to unhinge a man as three fevers, the measles, a large-sized whooping-cough, a pair of locked jaws, several attacks of influenza, and the doctor's bill." Nothing, I think, sets so wide a mark between a vulgar and noble soul as the respect and reverential love of womankind. A man who is always sneering at woman is generally a coarse profligate or a common bigot.

All my correspondents took it for granted that I wrote specially of young women, as indeed I did; this fact, moreover, serves to show that it is in a young woman's face where beauty is sought for. True, it is the most certain place to find it, but they should not command one's whole attention. Very young children and old people must not be neglected, for in both these classes may often be found some remarkable "soul-inspiring" and noble faces—faces upon which many changes may be rung and many valuable negatives secured.

The most likely fields of work in which to find beauty may be divided into three classes, viz., children, young women, and old people. As exposures upon young women comprise at least fifty per cent. of my photographic work, I had better confine my remarks to them alone, and leave the others for a later period.

I would, first of all, remark that ideas of beauty vary very considerably. This fact was brought very forcibly before me last summer, when a photographic friend of mine discovered that I was devoting most of my spare time to photographing a young woman as near the ideal as I could get. I thought, like Byron,—

> "Her glossy hair was cluster'd o'er her brow
> Bright with intelligence, and fair and smooth;
> Her eyebrow's shape was like the aerial bows;
> Her cheek all purple with the beam of youth."

"I cannot understand you," said my friend, "wasting your plates in that reckless manner upon such a conceited hussy, who is as far off beauty as we are from Japan." I was not, however, disheartened by such criticism, but kept "pegging" away until I had a good selection of negatives, *i.e.*, ninety-one. I hope I shall not be thought egotistical when I say my labours have been to my mind successful, and prints from the negatives have met with considerable recognition at various exhibitions. I thought the girl almost perfect, and said, as Shakespeare does, that—

> "She looks as clear
> As morning roses newly wash'd with dew.'

My friend, however, did not agree with me, but said I was "gone" on her, and, as a parting shot, quoted Spenser's well-known lines:—

> "And that same glorious beauty's idle boast
> Is but a bait, such wretches to beguile."

"Tell us, then," my readers will say, "what your idea of beauty is and where is it to be found?" There are, roughly speaking, two distinct kinds of beauty—the ideal and the real, the former artists of the brush deal with, while the "real" falls to the lot of a photographer. Imaginary beauty is pictured by many of our leading painters; but, in my opinion, it is best depictured by Mr. Cress Woollett, that clever black-and-white artist on the staff of *Sketchy Bits;* whenever he takes a head in hand, which is sure to be done well, they seem to be "angels ready-made for heaven." Take, for instance the double-page drawing of "Enid," given in the issue for March 9, 1896; if we photographers could pictorially portray such faces as these by means of the camera, photography would indeed be a glorious pastime; but we can't, and there's an end of it. Artists of the brush can indeed crow over us, for look what a power they have in their hands; they can employ several models when painting one single figure, one may have a good head of hair, another an exquisite mouth, and so on, which, when combined on the canvas, form remarkable pictures. An artist too, can, if he chooses, idealise a trifle; a nose that is too long can be shortened, and, *vice versâ*, more or less plumpness added to the features, &c., but to a photographer none of these aids to perfection are possible. By possessing such a power, artists can produce their own particular style of beauty without much trouble, and what a difference of opinion there exists between them! When such recognised authorities differ, who is to decide?

RICHARD PENLAKE.

(To be continued.)

CARAMELENE FOR BACKING PLATES.

[Read before the London and Provincial Photographic Association.]

As the time is now approaching for photographers to look up their apparatus for the coming season, this may be a fitting opportunity to describe some experiments I made about five years ago in order to obtain a variety of caramel which will dry and remain so unless the air be very much charged with aqueous vapour.

Beginners, judging by the queries we constantly come across in the weekly photographic papers, are beginning to appreciate the advice of those older in the ranks, that an unbacked plate is not worth exposing if we wish to obtain the best rest return for our trouble.

When looking at images on the screen produced by lantern slides, it frequently strikes one that the results would have been very much improved if backed plates had been used on which to produce the negatives. The tops of trees are buried, as it were, in a mist or fog, and the tops of tall buildings gradually fade away to mere ghosts.

Given a plate, with a reasonable amount of silver bromide in the film and a good backing on the reverse side, halation will be very considerably reduced, if not entirely prevented.

Of all the different backings that have been introduced at different times none can compare with caramel, and our best thanks are therefore due to Mr. W. E. Debenham for having shown the value of this substance as a means of reducing halation to a minimum. Its superiority over other backings is due to two properties: (1) its colour; (2) that its refractive index is very nearly the same as that of glass. How the refractive index has been determined with accuracy I cannot tell you, as in the solid condition, and when over about one-sixteenth of an inch in thickness, it is absolutely opaque.

Very frequently, however carefully we may cook the sugar, the resulting material is far from satisfactory—unsatisfactory in that it will not dry hard—and if we add gelatine it takes a considerable time, in some cases many hours, to dry. The slight modification I have to suggest enables a variety of caramel to be prepared, which will dry absolutely hard, unless, as I said, the air is very much charged with moisture. Caramel is naturally a very hygroscopic substance, and cannot therefore be made to dry absolutely hard under all hygrometric conditions of our atmosphere.

If we refer to Watts's *Dictionary of Chemistry*, we find caramel, as usually prepared, to consist of three distinct substances: caramelane, caramelene, and caramelin. Caramelane is soluble in alcohol of 84 per cent. and in water. Caramelene is insoluble in alcohol of 84 per cent., but soluble in weaker spirits and also in water. Caramelin is insoluble in water and alcohol, but soluble in weak spirit. These substances differ from each other, and from sugar only in that they contain less hydrogen and oxygen constitutionally. The sugar by the application of heat up to about 190° C. is dehydrated to such an extent as to form the first substance, caramelane, soluble in alcohol of 84 per cent. and in water; if now the temperature be raised to about 220° C., this body loses still more of the elements of water and is converted into caramelene.

Caramelane has but small colouring power, and besides is hygroscopic; caramelene, on the contrary, is very highly coloured, and possesses, it is said, six times the colouring power of caramelane, and is but slightly hygroscopic. When producing caramel for photographic purposes, we should aim at producing that variety which is as highly coloured as possible, and which absorbs the minimum of water from the air. It is

for this reason that, in cooking the sugar, it is necessary to urge the temperature to such a degree as to convert as much as possible of the caramelane into caramelene, but at the same time avoiding such high temperatures as will produce the insoluble variety, caramelin.

In order to produce the caramel from which the caramelene is obtained, proceed as follows:—Place in a capacious stewpan, say, one pound of loaf sugar (moist sugar will not do), and rest the whole on a clear fire, or, better, on a gas stove. As soon as the sugar begins to melt, stir it with an iron spoon, and, till the cooking is complete, the stirring must be continued, or the sugar may be charred locally. Until the whole of the sugar is melted there will be no great rise in temperature and the volume will be small, but soon after complete fusion the temperature will begin to rise, and abundance of bubbles will be formed, so as to fill almost completely the stewpan, unless it be a very capacious one indeed. Judging roughly, I should say that the volume increases to five or six times that of the fused sugar. After a few minutes the frothing will gradually subside, and the effect of the continued heat will simply cause the mass to boil, but without any very considerable increase in volume. At this stage the caramel is very fluid, of a light red colour by transmitted light, and the bubbles rise easily to the surface. The temperature is now about 220° C., and this temperature should be maintained for about fifteen minutes; at the end of that time the fused mass begins to thicken, and the cooking should not be continued more than four or five minutes after this stage, as, if it is, there is danger of the whole mass being converted into the insoluble variety, and time and material will be wasted. It would be best, perhaps, for a beginner to operate on a smaller quantity of sugar as a first trial, so as to study the different changes, and, when a satisfactory sample can be produced, then to repeat the cooking on a larger scale.

As soon as the caramel has passed through the various stages, pour out the contents of the stewpan on a piece of cold metal or on a slab of slate or marble. If sheet metal is used, the caramel will be found, as it cools, to detach itself in pieces from the support. If the operation of cooking has been properly carried out, when cold it will be brittle and free from tackiness.

The caramel should now be broken into small pieces and placed in a wide-mouthed bottle, and sufficient water added to cover about one-third the height of the caramel. If the bottle be set aside for a few days, the solid will have dissolved, and we shall have a thick, treacly mass of caramel dissolved in water. This solution contains both caramelane and caramelin. The next operation is to separate the one from the other. As I have already stated, caramelane is soluble in alcohol of 84 per cent. (sp. gr. ·84); if, therefore, the aqueous solution be poured into strong alcohol, the caramelane will remain in solution, and the caramelin will be precipitated. Ordinary methylated alcohol, of sp. gr. ·820, will do quite well, and eight to ten times the volume of the syrup should be used in order to effect the separation. If the alcohol is of the proper strength, the alcoholic solution ought not to be very deeply coloured, and a large, soft lump of caramelene should be found at the bottom of the precipitating vessel at the end of about an hour. When the solution is first mixed with the alcohol, it becomes of a brownish colour, due to the precipitation of the insoluble caramelene.

After draining off the supernatant liquor, water is added in sufficient quantity to form a tolerably fluid mixture. If this be used by itself to back plates, it will frequently be found on drying to flake off the glass. This defect can be avoided by adding from one-eighth to one-tenth volume of the original caramel solution. In this way a mixture is obtained which will both dry hard and remain firmly attached to the plate when dry.

In order to apply it to the plates, pour a small quantity into a saucer, and then allow a piece of absorbent wool to become partly saturated with it, and pass the wool over the backs of the plates till they are evenly coated. Only a thin coating is required for ordinary work; but, if a difficult subject is to be photographed, then it is better to apply the caramel with a brush, so as to leave a thicker layer on the plate.

So as to cause the caramel to dry quickly on the backs of the plates, instead of dissolving the caramelene in plain water, dissolve it in spirit and water, in the proportion of one of the former to three of the latter. Caramel thus prepared will dry, when the thickness is not excessive, in about thirty minutes.

The methylated spirit, as now sold, is not the most suitable for the precipitation, as, in consequence of the oil separating on dilution, the film dries with some patches more or less bare, caused by the repellent action of the oil. The old methylated spirit, however, does not produce this effect.

Some workers recommend the addition of burnt sienna or other insoluble body to the caramel; but this, I think, is a mistake. If plain caramel is used, the plate can be transferred direct to the developing solution, and without any danger of pinholes being formed, due to particles of insoluble matter adhering to the film, and so preventing the full action of the developer. The solution of the caramel in the developer has no detrimental action on the image.

The colour of caramelene is very non-actinic, so that, if at any time I could not obtain glass or other material with which to filter white light for development, I should not hesitate to trust to the light which comes through paper or linen coated with caramel.

A. Haddon.

THE LAW OF PRIVACY.

[The author of the following article, for which we are indebted to our contemporary, *The American Amateur Photographer*, is a member of the New York Bar. The point he raises is one of peculiar interest to photographers—especially to hand-camera workers.—Eds.]

The state of civilisation, rather than a disposition on the part of the common law to ignore personal rights, accounts for the fact that the law of privacy is yet an embryo without form and which scarcely has life. Only a few years ago the conditions were such that the necessity of a *law securing privacy* was hardly thought of.

But, now that newspaper "enterprise" is behind the times if it does not proclaim all that is done in the closet at midnight from the surrounding housetops at sunrise, and culture has made people sensitive to the public stare, while there seems to be no armour invincible to the ever-present "button" and flashlight, the question presents itself, Is there no protection, or must one submit to have his deeds and likeness serve to gratify the idle curiosity of the multitude for the private purposes or emoluments of a stranger?

The question of the rights of privacy was passed upon in the well-known cases of Corliss *v.* Walker and Schuyler *v.* Curtis (reported in these columns some months ago), and in both case *injunctions were refused* to relatives of the deceased, Mr. Corliss and Mrs. Schuyler, who were naturally averse to the publicity which the breach of this right of privacy entailed.

In both cases the last court of resort in the State of New York—the Court of Appeals—held virtually that this unwished and undesirable publicity, forced upon the respective families of the deceased, was a thing "of which they could not complain." Strange, passing strange!

Upon turning to the cases cited in the note to the Corliss action, viz., (an unsuccessful attempt to enjoin the multiplication of his photographs) no case is found which directly involves the "Law of Privacy," until within the last few years, The few cases upon the subject show a tendency to uphold the right, one case even carrying it to an extreme.

There the use of a negative of an actress was enjoined, which was procured while she was enacting a *rôle* upon a public stage, probably, however, the injunction forbidding the multiplication of her photos would have been denied had the defendants fought the case; in every aspect it was a tight squeeze.

That some protection to privacy should be afforded cannot be successfully disputed, but what the limit should be is a difficult question.

I am willing to admit that in many cases, when the public becomes interested, the question will arise, "Has not some act been committed which has removed the mantle of privacy and made the person a character who has of his own volition surrendered his former position and rights?" But I aver strenuously that the gratification of mere idle curiosity and the invasion of the right of privacy for pecuniary or other ulterior purposes should be stopped.

I believe, too, that there is likely to be considerable litigation in the future for the definition and protection of this sacred right of privacy.

I trust I may be pardoned for quoting from an article of mine in the April, 1894, number of *The American Amateur Photographer*: "The foregoing leads me to suggest that, while the individual (a term which includes Judges) is an 'insoluble' puzzle, in the aggregate he becomes a mathematical certainty. You can, for example, never foretell what any man will do, but you can say with precision what an average number will bring about." Individuals vary. In twenty years from now the percentage of decisions relative to the "rights of privacy" will be vastly different from the trend of our present decisions.

Wm. Geo. Oppenheim, LL.B., PH.D.

CALENDERING OR BURNISHING PHOTOGRAPHIC PRINTS: PRATT'S IMPROVEMENTS.

Mr. W. Pratt's invention relates to improvements in machines for calendering or burnishing photographic prints in which two horizontal rollers are used, and has for its object to provide simple and efficient means whereby one of the said rollers may be easily and quickly adjusted in a parallel or level position with respect to the other roller.

"According to my invention," says Mr. Pratt, "I mount the top roller in suitable bearings formed in the standards at each end of the machine, the lower roller being carried by sliding blocks or bearings fitting in openings or guides formed in the said standards. Underneath the lower roller is a shaft supported at each end by the standards, and running parallel with the said roller at a short distance therefrom.

"This shaft is provided near each end with a cam or scroll, and each of the adjustable blocks or bearings of the lower roller is formed with a projection which bears upon or engages with the said cams or scrolls in such a manner that, as the cam shaft is turned, by means of a hand wheel at one end, in one or the other direction, the lower roller is raised nearer to, or lowered further from, the upper or fixed roller.

"The two cams or scrolls being similar to each other in shape and size always maintain the lower roller in a parallel or level position with respect to the upper roller, and recesses are formed in the standards within which the cams or scrolls work.

"In the accompanying sheet of drawings, illustrating a machine according to my invention, fig. 1 is a side view thereof with one end partly in section, and fig. 2 is an end of the same with a portion of the standard broken away.

"*a a* are the two end standards, and *b* is the top roller mounted in the bearings, *a*, of the said standards; *c* is the lower roller carried by the blocks or bearings, c^1, capable of sliding within the guides or open parts, *a* 2, of the standards; *d* is the shaft supported at each end by the standards beneath the roller, *c*, and parallel with the same; *e e* are the cams or scrolls formed with or fixed to the shaft, *d*, near its outer ends.

"Each of the blocks or bearings, c^1, is provided with a curved projection, *c* 2, which bears upon, or engages with, the outer curved surface of the

Fig 2

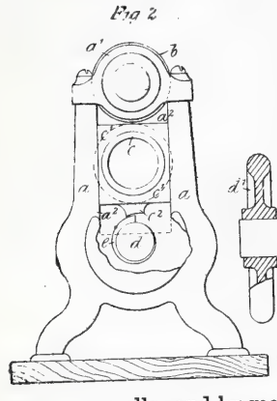
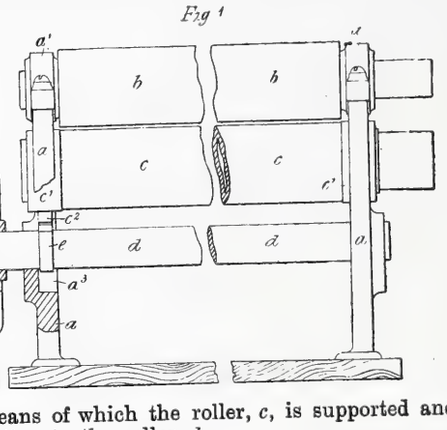


Fig 1



cams or scrolls, and by means of which the roller, *c*, is supported and adjusted in a parallel position to the roller, *b*.

"This adjustment is effected by turning the shaft, *d*, by means of the hand wheel, *d*, fixed on one end of the same, and the cams or scrolls preferably work within recesses, a^3, formed in the standards, *a*.

"The photographs to be burnished are placed between the rollers, *b* and *c*, and the latter are revolved by any suitable means.

"The roller, *c*, is preferably made hollow for receiving a gas-jet pipe for heating it internally, or it may be heated externally."

The claims are for:—

1. In machines for calendering or burnishing photographic prints the employment of two rollers, the lower one of which is adjusted nearer to, or further from, the upper one by means of cams or scrolls formed with, or fixed upon, a shaft carried underneath, and parallel to, the lower roller.

2. In machines, as above claimed, the combination with the standards, *a*, of the top roller, *b*, mounted in bearings, *a*, the lower adjustable hollow roller, *c*, carried by bearings, *c*, having projections, c^2, and sliding between guides, a^2, of the standards, and the shaft, *d*, provided with adjusting cams or scrolls, *e*, working in recesses, a^3, of the standards and operated by means of a hand wheel, *d*.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

The Annual General Meeting was held at 12, Hanover-square, W., on January 27, 1897, Mr. W. Thomas in the chair.

The Chairman's report and the balance-sheet (as follows) were read and adopted:—

The number of Societies affiliated at the beginning of 1896 was forty-one.

According to custom a series of lectures was held in the spring, the subject selected being *Photography with the Bichromate Salts*. It was thought that the popularity of the lectures on previous occasions justified the Committee in increasing the number from two to six, but the series met with but moderate support. Arrangements were made with Messrs. Dawbarn & Ward to publish the series in book form, they printing 500 copies, and handing 200 copies to the Affiliation Committee free of charge. This being done, four copies were sent to each Society affiliated.

The Conference of Secretaries of the Metropolitan Affiliated Societies has again been held, and resulted in facilitating the work of the Secretaries who took part in it. The circulation of papers and lantern slides has been continued during the year, but to a much increased extent. This has been accomplished by obtaining lectures specially written and illustrated, both with lantern slides and otherwise, for the purpose of being lent for reading to the various societies. The following is the list of lectures so obtained during the year. The popularity of this feature of the work of the Affiliation is best attested by the fact that, during the last three months of 1896, sixty-one meetings of various societies were in this manner provided for, whilst eighty-one meetings during 1897 have lectures booked to them already. *Architectural Photography*, by Mr. H. W. Bennett, F.R.P.S., with lantern-slide illustrations; *Hand-camera Work*, by Mr. W. Thomas, illustrated by means of lantern slides and prints *Intensification and Reduction*, by Mr. John McIntosh, with lantern-slide illustrations; *Lantern-slide Making*, by Mr. J. A. Hodges, F.R.P.S., with lantern-slide illustrations; *Negative-making*, by Mr. Chapman Jones, F.I.C., F.C.S., F.R.P.S., with lantern-slide illustrations; *Pictorial Photography*, by Mr. A. Horsley Hinton, with lantern-slide illustrations.

Arrangements have been started, and are now well in hand, for inaugurating a collection of the best photographic work of the day, with a view to its circulation as a travelling exhibition amongst affiliated societies.

A number of favourable replies have been received to the request of the Affiliation for pictures, and it is hoped the scheme will be able to come into operation very shortly.

We start our present year's work under promising conditions; twelve new societies have been this month admitted to affiliation, and a brighter and more active interest is being taken in the work of the federation by workers all over the country.

The Sub-lecture Committee have considered subjects for further lectures, which will be added gradually, from time to time, to those we already possess.

Balance-sheet of the Affiliation of Photographic Societies with the Royal Photographic Society for the Year ending December 31, 1896.

CASH ACCOUNT.

Receipts.

	£	s.	d.
Brought forward—balance from last year	29	4	11
Subscriptions—42 societies	44	2	0
Tickets sold for lectures	3	8	6
Due to the Royal Photographic Society	5	0	2
	£81	15	7

Payments.

	£	s.	d.	£	s.	d.
Fees for lectures				40	10	0
Lantern				4	5	0
Hire of chairs for lectures				4	13	6
Printing				5	7	3
Typewriting	0	19	0			
Copyright	0	5	0			
Housekeeper	1	5	0			
Miscellaneous lecture expenses	0	14	6			
Sundries	1	15	4			
				4	18	10
Royal Photographic Society for postage, clerical expenses, journals, use of rooms, &c., as agreed ...				22	1	0
				£81	15	7

Overcharge in sundries 1*l.* 15*s.* 4*d.* of 7*s.* 2*d.* to be carried into account for 1897. Geo. Scamell, *Hon. Treasurer.*

The balance-sheet of the Affiliated Societies, examined with vouchers, and found correct. Jas. W. Marchant, *January* 21, 1897.

The following officers were elected for the ensuing year:—*Chairman:* Mr. W. Thomas.—*Treasurer:* Mr. G. Scamell.—*Auditors:* Messrs. P. Everitt and A. Mackie.

The report of the Circulating Lectures Committee, in which they stated that the lectures already provided were greatly in demand, and recommended a further number of new lectures being put in hand at once, was read and adopted.

The report of a Committee recommending that, in view of the greater popularity of the circulating lectures, none should be given at a fixed spot in London, as in former years, the attendance hardly justifying the outlay, was also adopted.

The Committee appointed to arrange for a circulating exhibition was empowered to expend a sum not exceeding 20*l.* in so doing.

It was agreed that an endeavour should be made to arrange for a meeting of the delegates of societies in Yorkshire and the neighbourhood.

After deciding that, in future, the Annual General Meeting shall be held on the last Wednesday in January, the meeting concluded with votes of thanks to the Chairman and officers.

THE LIMELIGHT IN THEATRES.

Mr. Clement Scott publishes, in the *Daily Telegraph*, the following letter from Mr. William Callcott with reference to the introduction of the limelight in theatres:—

"I can give a few items of information, from personal experience and knowledge of the parties I shall name herewith, as to the introduction of the limelight (oxyhydrogen) into the theatre. Early in the thirties (date I am uncertain) a drama, *All for Love; or, The Lost Pleiad*, was produced at the Adelphi. The incomparable Mrs. Nisbett played the principal part. In this was a vision of beautiful women lit up by lime light. This was managed and worked by Frederick Gye. It was an open light in a box, and the lime was rotated by clockwork, the difficulty being unsteady light and the breaking of the lime. The oxygen gas was made underneath the stage-door in Maiden-lane. One day there was an explosion, nearly killing the hall-porter, named Shaw. Now, these

langers did not popularise the limelight. In fact, the old dodge of urning blue fire in an iron box, with open front and a chimney, was ontinually in use. I saw at the Opera House this contrivance had been ised in a ballet, *L'Ombre*. The limelight was next time used at Drury-ane (Anderson's time) in the *Prodigal Son*, 1851, to light up the people leeping on the steps of the Temple. This came about in this way: ohn Gray, excellent scene-painter at the Britannia Theatre, who also ainted slides for magic-lantern dissolving views, had operated with the xyhydrogen in the lanterns, knowing Henry Cuthbert, one of Ander-on's painters, had suggested the limelight for the Temple scene. I saw t. It was not brilliant. The late Walter Kerr and a philosophical in-trument-maker, named Pearce, perfected the machine, and Mr. Charles ean used it extensively for scenic effect only. It was costly, and at his time the lens was added. It is singular, but a fact, that the lime-ight was not used by Madame Vestris all the years at the Lyceum, nor as it by me at the Haymarket with Mr. Buckstone. Kerr popularised he working, and his son works it now.

"With regard to traps, I may say that I saw, at the English Opera House (Lyceum), in 1834-35, G. Macfarren's opera, the *Devil's Opera*. n this the celebrated George Wieland played a sort of sprite, and traps f all kinds were used—star, spring, vampire, terrific falls from the flies, c. Of course, in his time, he got all his bones broken. G. Conquest as done it all since. Electricity, as George Augustus Sala said in the *Daily Telegraph*, is your only novelty."

Our Editorial Table.

Aide Mémoire de Photographie.

By Albert Londe. Paris: J. B. Ballière et Fils.

This is a new edition of Londe's well-known handbook, the rincipal chapters of which deal with light; photographic material; he camera; the lens; the shutter, &c.; the studio and the aboratory. Negative-making and printing occupy a large space, nd the scope of the work may be indicated from the fact that, esides collotype and enlarging colour photography, orthochromatism nd photography by artificial light are treated of. The work, which as been brought down to date, in that radiography is treated of, ppeals to advanced workers, who will find it a sound and useful uidebook.

Penrose's Collodion Emulsion.

Penrose & Co., Upper Baker-street, Lloyd-square.

The pleasurable feeling we experienced in developing some trans-arencies made in this collodion was enhanced by the circumstance hat the emulsion was prepared according to the formula, and under he direction, of Mr. W. B. Bolton, whose knowledge and experience f collodion emulsion is, of course, unequalled. Primarily introduced or process-work negatives, for which it is admirably adapted, enrose's collodion emulsion has been found very suitable for lantern lides; and it is supplied both washed and unwashed.

We tried the washed emulsion and found it a fine, smooth, free-owing preparation. Upon the coated plates we prepared some stereo-copic transparencies by contact, using the developer, pyro and mmonium carbonate, given at p. 975 of our Almanac. The haracteristic richness and beauty of the image, added to the other dvantages of collodion for transparency work, impressed us with the onviction that an emulsion of this clean and brilliant working haracter would be welcomed by many amateurs, to whom, as well s to process workers, it can be confidently recommended. We ppend the instructions for development, &c.:—

Before use, pour off a portion of the contents and shake the bottle ntil the whole of the sediment, if any, is taken up. Although the nulsion is filtered as carefully as possible before sending out, the rticles of silver bromide may aggregate into coarse lumps if allowed stand for some time. Should this occur, shake vigorously for two three minutes or at intervals, and filter through a tuft of cotton ool, packed lightly into the neck of a funnel.

Clean the plate as for wet collodion, and polish with powdered lc or edge with indiarubber solution. After coating with emulsion, e plate may be allowed to dry spontaneously, which it will do in short time, or it may be hastened with heat or in a current of air ithout any fear of drying marks; or, if for exposure in the camera, may be used at once without the trouble of drying, provided the posure is not long enough to allow it to partly dry. It then only quires immersion in water until the latter runs freely from the rface; but, if dried, it should be moistened with equal parts of cohol and water before development. For contact printing the m is strong enough to resist gentle pressure, but care should be ken not to rub it against the negative.

Development.—The development can be carried out in a dish or preferably on a pneumatic holder, when a much smaller quantity of solution will suffice.

Make the following stock solutions:—

A.

Pyrogallic acid	1 ounce.
Metabisulphite potash	1 „
Water	9 ounces.

B.

Liquor ammoniæ ·880	1 ounce.
Bromide of potassium	2 drachms.
Water	7 ounces.

For an ounce of developer take 30 minims of A, and 20 minims of B, making up with water. When all detail is out, add 10 minims more of B, and continue until density is obtained.

Intensification and Toning.—For lantern slides and transparencies a variety of warm tones can be got by alkaline development alone, varying the exposure and development according to the tone required; but for purple or black tones, or when greater density is required, the following plan is recommended:—

Solution No. 1.

Pyrogallic acid	3 grains.
Water	1 ounce.

Solution No. 2.

Nitrate of silver	60 grains.
Citric acid	30 to 60 „
Water	1 ounce.

Well wash after the alkali, and flood the plate with a small quantity of No. 1. Return to the measure glass, add a few drops of No. 2, and proceed until the result is obtained. Fix with hypo.

In this collodion emulsion Messrs. Penrose have a good preparation, which should be popular for both negative and transparency work.

Elliott's Bromide Paper.

Elliott & Son, Barnet, Herts.

The bromide paper of Messrs. Elliott has always been noted for several excellent qualities which go far towards keeping this method of photographic printing popular with photographers. An artistic matt surface, pure whites, and a rich black deposit, combined with perfection of gradation, are the principal features of the paper, of which a recent trial has enabled us once more to obtain experience. It is obvious, too, that very great care is devoted to the preparation of the paper, evenness of coating and freedom from minute defects being conspicuous. Ferrous oxalate and metol are recommended as suitable developers; in our hands the former yielded us results with which we could find no fault.

News and Notes.

Mr. A. C. Baldwin has been appointed the travelling representative of the Paget Prize Plate Company of Watford.

Enammo.—This is the name given by Messrs. Wellington & Ward to a glazed-surface bromide paper of slight pink tint.

As may be seen by reference to our outer pages this week, Messrs. Elliott & Son, of Barnet, have adopted a novel and effective form of pictorial advertisement.

The Richmond Camera Club hold a *Conversazione* in the Prince's Hall at the Star and Garter Hotel, Richmond, on Thursday evening, February 25, 1897, at eight o'clock.

Royal Photographic Society.—Technical Meeting, February 23. *The f-6 Stigmatic Lens and the New Astigmatic Corrector*, by Thomas R. Dallmeyer. *The Perfected Kromskop*, by F. E. Ives.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. J. C. Oliver, 2, Royal-terrace, Glasgow, for his negatives, *A Pair of Snow Scenes*.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C. Wednesday next, February 24, Travellers' Night. *A Walk Through some of the Mediæval Towns of Bavaria*, with lantern illustrations, by Mr. J. J. Vezey.

London and Provincial Photographic Association.—On Thursday, February 25, Messrs. T. E. Freshwater and E. J. Wall will give a demonstration on *Polarised Light*, with lantern experiments. This is the second of the course of demonstrations. The third will be on *Colour*. Visitors are always welcome to the meeting. The first demonstration on *Light* was extremely interesting and attractive.

We omitted to state at the time that Mr. Morley Brook's paper on *Lantern-slide Making*, that appeared in our issue of the 5th inst., was taken from the *Photographic Record*, the excellent quarterly organ of the Manchester Photographic Society.

Sir Henry Trueman Wood is announced to read a paper at the Society of Arts on *The Reproduction of Colour by Photographic Methods*, on the 24th inst. Captain Abney, C.B., F.R.S., will preside. Illustrations will be shown of several of the recently invented processes for the photographic reproduction of colour.

We are sorry to learn of the death on February 9, at Leamington, of Surgeon-General J. L. Ranking. The deceased gentleman had practised amateur photography for a great many years, and will, doubtless, be remembered by our older readers for his excellent contributions to the pages of this Journal and its Almanac.

It has been found by MM. Maneuvrier and Fournier that acetylene obtained by the action of water upon calcium carbide is not pure, only ninety-four per cent. of it being absorbed by the ammonio-chloride of copper. After purification, the gas is said to lose its characteristic alliaceous scent, though still possessing a strong, penetrating odour.

Poster Portraits.—The Meisenbach Co. draw our attention to the Meisenbach New Method of engraving half-tone plates in enlarged size from any good cabinet photograph or wash drawing, &c., for posters, contents bills, large portrait supplements of celebrities, &c. The plates are etched as deep as ordinary outline zincos, and give most excellent results on cheap paper with common ink; whilst on good paper, with superior ink, the results compare favourably with the most finished artistic productions by any known method.

"What does the Society for Checking the Abuses of Advertisement think," remarks the *Daily Chronicle*, "of the alarming growth of the illuminated signs that wink or stare at us perpetually in the London thoroughfares? The latest we have seen is the name of a gentleman, who may or may not be the rejected of Walthamstow, which glares hideously from the southern side of the river at all those who nightly wander along our palatial Embankment. And this is not the only atrocity of the kind on the Surrey side of the river. By-and-by, perhaps, there will be a row of them occupying every coign of vantage; and, when the south bank is full, some more ingenious person may hire a barge and illuminate it with the praise of soaps or whiskies. We have stopped the sky sign; is there to be no limit to the new nightmare?"

The *employés* of Jonathan Fallowfield, of 146, Charing Cross-road, held their Second Annual Smoking Concert at the Duval Restaurant, Newgate-street, on Friday, February 12. Mr. F. W. Hindley occupied the chair, Mr. H. J. White (the Manager of the firm) being Vice-Chairman. There was a crowded attendance of ladies and gentlemen, among the visitors supporting the Chairman being Mr. Turnbull (W. Wray). Mr. Alexander Mackie, Mr. S. H. Fry, Mr. A. E. Staley, Mr. Bedding, &c. A capital programme of songs, instrumental solos, recitations, animated photographs, was gone through under the direction of Mr. F. J. Goode, the Hon. Secretary, who, with a Committee, worked hard for the amusement of the visitors. The concert was most successful and enjoyable, and the Chairman, Mr. Goode, the performers, and the stewards were cordially thanked.

It was safe!—"And my photograph that I sent you," she whispered; "have you always kept it with you?" "Always, darling," he said, "next to my heart, which beats for you alone. I have kept it there since the day I received it." "Let me see it." He pondered a moment, and then said, anxiously, "You believe me, don't you, dearest?" 'Of course, I believe you. It is close against your heart, where you can feel it when it beats?" "Yes." "Show it to me just for a moment." "Some other time, darling." "Harold, you are deceiving me. You have thrown my picture away, and are carrying some other girl's." "No, no. I swear by——" "Then show it to me." "I cannot now. Won't you trust me, darling?" "Mr. Simpson, all is over between us. Never speak to me again." "But——" "Good night, sir." When Harold reached the sidewalk, he reached under his coat-tail, drew out a lot of old letters and a tintype, and muttered, "One thing is certain, I'll have to either quit carrying things in my hip pocket or post myself better on anatomy."—*Detroit Free Press.*

The Yarmouth Convention.—"Owing to the illness of Mr. H. Harvey-George, and his consequent sojourn abroad," says the *Yarmouth Independent*, "the arrangements for the Convention of Photographers, to be held in Yarmouth next July, have been delayed; but the time has not been altogether lost, the Rev. E. Rainbow, of our Camera Club, having been in correspondence with Mr. Drage, the Secretary of the Convention, and, with the return of Mr. Harvey-George, a few days hence—quite restored to health, we trust—a Reception Committee will be formed, a programme drafted, and everything possible done to afford the 600 or 700 ladies and gentlemen who will join in the Convention a week to be remembered for its happy associations. Under the presidency of the Vicar (the Rev. Canon Rogers), the Rev. Rainbow gave an explanatory lecture to the members of the Camera Club at St. George's Church Rooms on Wednesday evening. The Vicar congratulated Yarmouth on the fact that the Photographic Convention of the United Kingdom had accepted the invitation of the Club to meet in Yarmouth this year. He believed it would give a great stimulus to photography in the town and district. Mr. Rainbow said the Vicar had practised the art of photography for many years, and had taken no less than sixty views in one day in Rome. He invited Canon Rogers to show them and give the Club a lecture on some future occasion. Last year they had an intimation that the Convention would like to hold a meeting in the eastern counties. Relying on support from the town and surrounding district, the Club sent an invitation by one of its members to the Convention, then at Leeds, and it was accepted. The Convention was an association of photographers, ladies and gentlemen, professionals and amateurs, or others who are in any way interested in photography. Membership was obtainable by the payment of the small sum of 5*s.* annually. The advantages were numerous. Photographers who resided far apart were brought together for interchange of ideas, novices met veterans, friendships were formed, courtesies were exchanged, special permission was obtained to visit places otherwise closed, and papers were contributed by experts and enthusiasts. Like the Church Congress, British Association, and Royal Agricultural Society, the Convention met in different towns each year. Last year Leeds was thus favoured. Mr. Rainbow described how the Convention was started by two ardent gentlemen in 1886, and the success which had attended it, and went on to say its Council had asked whether Yarmouth could carry out the annual meeting. He had no doubt whatever about that. A strong local executive committee would have to be formed, and upon it would rest a great deal of the preparatory work. If the expected support were forthcoming, the visit to Great Yarmouth would be one of the most successful of the series. He hoped that one of the features of the week would be an exhibition of East Anglican pictures. At Leeds the Marquis of Ripon was at the head of the Reception Committee. The Executive Committee arranged all meetings and excursions. He would be glad to receive any suggestions, and hoped the members of the Camera Club, all local photographers, and the townspeople at large, would do all they could for the comfort and happiness of their anticipated visitors. If they did that, the next Convention would not be less successful than at Leeds. By the aid of a fine lantern, worked by Mr. E. H. Swann, Mr. Rainbow exhibited over eighty splendid pictures, secured by members of the Convention, in and around York, Shrewsbury, Bolton Abbey, Kirkstall Abbey, Fountains Abbey, Stratford-on-Avon, and other places of great antiquarian or scenic interest. Mr. and Mrs. R. T. Brain, Mr. and Mrs. Pratt, Mr. Theo. W. Swindell, Mr. C. Rumbold, Mr. G. Waller, Mr. Gostling, and several other photographers and friends were present to assure Mr. Rainbow of their hearty co-operation.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
22	Camera Club	*Spitzbergen.* E. T. Garwood.
22	North Middlesex	*Architectural Photography.* C. H. Oakden.
22	Richmond	*Intensification and Reduction.* Thomas Bolas, F.C.S, F.I.C.
23	Birmingham Photo. Society	Exhibition of Competition Pictures and Slides Illustrating the Society's Excursions of 1896.
23	Bournemouth	*Hand-camera Work.* W. Thomas.
23	Hackney	Annual Dinner.
23, 24	Leigh	Members' Second Exhibition.
23	Munster	Demonstrations on Lenses. H. Lund.
23	Newcastle-on-Tyne	*Working up Prints and Enlargements.* Jos. Jobling.
23	Royal Photographic Society	*The f-6 Stigmatic Lens and the New Astigmatic Corrector.* Thomas R. Dallmeyer.—*The Perfected Kromskop.* F. E. Ives.
24	Borough Polytechnic	*The Sky in Photographs.* F. W. Levett.
24	Camera Club	Testing Lantern Slides.
24	Croydon Camera Club	*Intensification.* Thomas Bolas, F.G.S., F.I.C.
24	Halifax Camera Club	*Practical Pictorial Photography.* A. Horsley Hinton.
24	Isle of Thanet	Prize Slides.
24	Leeds Camera Club	Smoking Concert.
24	Leytonstone	Discussion on the Summer Excursions, followed by Members' Lantern Evening.
24	Photographic Club	*A Walk through some of the Mediæval Towns in Bavaria.* J. J. Vezey.
24	Stockport	*Figure Studies and Pictorial Portraiture.* T. Morley Brook.
25	Ashton-under-Lyne	*Enlarged Negatives.* Thomas Glasebrook.
25	Aston	Exhibition of Lantern Slides. Charles Baynton.
25	Camera Club	*Silchester: the Result of Recent Explorations.* H. Jones.
25	Ireland	*Wanderings with a Hand Camera about Windermere.* James Simpson.
25	Liverpool Amateur	*Art in Relation to Photography.* A. Horsley Hinton.
25	London and Provincial	*Polarised Light.* T. E. Freshwater and E. J. Wall.
25	Oldham	*Rome.* J. S. Dronsfield, J.P., and L. G. A. Harries-Jones.
25	West Surrey	Lantern Night. J. S. Bond.
25–27	Woolwich Photo. Society	Annual Exhibition.
26	Bromley	*Birds, Horses, and Dogs.* Thomas Fall, F.R.P.S.
26	Croydon Microscopical	Demonstration of the Carbon Process. J. H. Baldock, F.C.S., and Charles Moss.

ROYAL PHOTOGRAPHIC SOCIETY.

February 16.—Photo-mechanical Meeting,—The Rev. F. C. Lambert, M.A., in the chair.

Mr. H. Snowden Ward referred to the fact that, at the recent photo-mechanical meeting, it was suggested that paper coated with viscose would probably give good results in half-tone printing, and it was stated that paper could not be coated with viscose. He said he had been in communication with Messrs. Cross & Bevan upon the subject, and he now showed specimens of printing on viscose-coated paper, from which it appeared that such paper was not well suited for half-tone printing, because the substratum on which the viscose was laid was not sufficiently smooth; but, at the same time, the specimens showed that viscose could be employed for facing where only a small quantity of ink was necessary.

Printing from Intaglio Plates.

Mr. Horace Wilmer read a paper on this subject, and gave a demonstration of the process. He said that, although very little was to be found in English technical literature as to intaglio printing, there was, among the publications known as the *Encyclopédie Roret*, an excellent French manual called *Manuel de l'Imprimeur en Taille Douce*, in which the whole subject of copper-plate printing was very exhaustively discussed, and which he believed represented fairly accurately the methods in use at the present time. Applying his observations more particularly to photogravure, he proceeded to describe the printing presses. Most modern presses, he said, had iron tables and rollers, but a good modern bed was looked upon with favour by printers who aimed at turning out high-class work. The blankets, resting on the plate and distributing the pressure of the upper roller, were of three kinds, varying from one of fine and extremely close texture next the plate to one of coarse and open character. The papers suitable for copper-plate printing were discussed at some length, and samples of plate paper, toned etching paper, lined Dutch paper, and various kinds of Japanese paper were passed round for inspection. With such a variety of papers a large number of effects could be produced, and, to ascertain the best result that could be secured from a plate, proofs should be pulled on each kind at one's disposal before deciding which to use for the actual prints. Black, ground up in burnt linseed oil, was the basis of all copper-plate inks. When purchased ready-ground, it would rapidly deteriorate, and the amateur was recommended to grind up the dry colours on a piece of lithographic stone, better results being obtained from freshly ground ink. The colours required would be raw and burnt umber, sienna, and vandyke brown; a little carmine used with black would give very brilliant shadows. A dabber for applying the ink to the plate could be made from coarse blanketing, or could be bought ready-made; it should be slightly curved on top, and the loose fluff should be removed from the surface by burning with a lighted taper. In inking up the plate, the dabber must not be pushed, or dabbed roughly on the plate, and a fair amount of ink must afterwards be removed by means of a muslin or canvas pad worked in circular sweeps round the plate; the margins must also be carefully wiped with a rag kept for the purpose. The plate being placed on the press, the paper—damped and surface-dried—is adjusted face downwards on the plate, the blankets are laid over it, and the press is worked. A shallow plate will require a thick ink, while with a strongly etched plate the ink might require to be considerably thinned down. When the prints are taken off the press and dried, it is usual to damp them a second time and place them in pairs, back to back, between heavy millboards, which has the effect of pressing out the plate and work and causing the prints to dry flat.

Mr. W. Gamble showed a prospectus of a French machine for photogravure printing, which was said to be capable of turning out from 250 to 400 proofs per hour, and to perform the operations of inking, wiping, and printing, with three men to work it.

Mr. T. Bolas thought he saw this apparatus some ten years ago, when he examined a machine which was printing a very fine subject in an excellent manner. He had not found that professional printers made any mystery about their methods, and had been present when his plates were proofed.

Mr. A. E. Smith recommended the use of liquid ink, which could be purchased in a variety of colours and could be used cold.

After a brief discussion, in which Messrs. Sinclair, Ward, Thomas, James, Handford, Ives, and others took part,

Mr. Wilmer replied to some of the points which had been raised. He said he had lately seen some very fine examples of machine-printed photogravures by Messrs. Waterlow. He thought the usual method of picking out the high lights was to burnish them on the plate, which was easier than picking them out after inking. During the wiping, the plates were frequently rewarmed as the ink cooled and became hard. He had found copper-plate printers very ready to render assistance to an amateur, and to describe their methods, but he thought it was contrary to the regulations of the trade society to teach the art. To preserve steel-faced plates, it was necessary to cover them with wax or bitumen varnish, but unsteeled plates need only to be wrapped in tissue paper.

The Chairman expressed surprise that photogravure was not more taken up by amateurs, inasmuch as it was one of the most flexible processes at their disposal, in the sense that the results from a negative could be modified more than by any other means that he knew of. The depth of the plate, the inking, the strength of the ink, the degree of wiping, the nature and quality of the paper, the pressure—all these points played an important part in the final result. He had tried the liquid ink, and found it fairly satisfactory.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 11,—Mr. Harvey in the chair.

Caramelene for Backing Plates.

Mr. A. Haddon read a paper on this subject [see p. 120]. He handed round samples of caramelene and plates backed with it.

In reply to questions, Mr. Haddon said it was best used dry. The backing if made matt, as suggested by the Chairman, would simply reflect light more evenly, whereas the glossy backing reflected it irregularly. The backing came off in the developer, and did not stain the gelatine. The addition of more spirit to the backing would make it run in patches.

Mr. E. J. Wall said there was a caramel on the market at present largely used by brewers for colouring beer and stout, which could be had in various shades. He had found this the very finest backing for plates. Mixed with water, it worked satisfactorily. He alluded to mixtures of the aniline dyes—chrysoidine, malachite green, &c.—which might be used for backing purposes. He gave a formula for a caramel backing, viz.,—

Caramel powder	1 ounce,
Water	6 drachms,
Methylated spirit	2 „

which one need not trouble to dry, simply placing a piece of paper over the backed plate. The hypo would remove any stain that was caused.

Mr. Hodd narrated his experience of commercial backing mixtures, some of which he found would not dry.

The Chairman mentioned an instance where, photographing the interior of a church with unbacked plates in company with a fellow-member who had used backed plates, his (the Chairman's) negatives had not shown halation, whereas the other member's had.

In reply to a question, Mr. Wall said the use of isochromatic plates did not do away with the necessity for backing.

As to the question of backing affecting the rapidity of a plate, Mr. Haddon thought that the same value of the light where it fell was not obtained unless there was something to throw it back.

Mr. Wall suggested the application of the backing to paper, so that it could be squeegeed on to the plate, and the paper stripped off.

Mr. Haddon had tried it, but found that it would not do, as air bubbles were formed which reflected light.

After other discussion, a vote of thanks was passed to Mr. Haddon.

PHOTOGRAPHIC CLUB.

February 10,—Mr. R. P. Drage in the chair.

The Hon. Secretary showed examples, lent by Sir Henry T. Wood, of the new colour pictures made by M. Chassagne. These were examined with considerable interest by the members.

Mr. Fry introduced Mr. Boyce, an American photographer visiting England. He assured him of the hearty welcome which the Club accords to all strangers practising or connected with photography.

The Chairman having welcomed him, Mr. Boyce suitably responded.

Mr. Lewis Medland then gave an illustrated address, entitled

My Holiday Tour: Great Yarmouth and Neighbourhood.

Mr. Medland, in a chatty manner, gave an entertaining description of the neighbourhood which the Photographic Convention is to visit this year. Illustrated by 150 slides of topographical, archæological, and general interest, the lecturer held the attention of the meeting for an hour or more whilst he discoursed of the attractions of Great Yarmouth as a centre for photographic work.

Mr. Tottem proposed a vote of thanks. He had himself known the district for upwards of sixteen years, and he commended it to prospective Conventioners.

Mr. Drage seconded. He said that the members and friends of the Club had experienced a delightful evening, and he anticipated a full Convention meeting.

Mr. Medland thanked the meeting for their appreciation. He had known the district for thirty years, and felt sure a visit would prove satisfactory.

Mr. Stretton said that he had heard from time to time that users of Edwards's patent dark slides (which were, he believed, extensively in favour) experienced a fogging of the plate at one end. He had been experimenting with the slides (which are provided with a celluloid draw shutter) and found that by moving the piece of celluloid quickly to and fro, and then suddenly withdrawing it, he obtained a brilliant discharge of electricity. There was not anything extraordinary about this, as the celluloid passed over a piece of velvet or cloth. He thought, however, that such a discharge accidentally made when the shutter was withdrawn for the purpose of making the exposure, would possibly account for the fogging referred to. He mentioned the matter as one of general interest. The inference to be drawn from his remarks was to withdraw the shutter in a careful manner, and to avoid any disturbance of the electric equilibrium.

Croydon Camera Club.—Seventh Annual Meeting.—The above was held at the Club-room, 106, George-street, on Wednesday, the 10th inst. There was a large gathering, including the most influential members of the Society, to hear the annual report, which was read by the President. The report indicated that the work of the Society has been carried on with much activity throughout the year. Twenty-five specially important meetings have been held, at which the average attendance was twenty-nine. Since the opening of the new rooms the average attendance has further risen to forty per meeting. During the year, while there were only nine resignations, twenty candidates were elected. The Club is entirely free from debt, and, moreover, on January 31, the cash balance in the Secretary's hands amounted to 21*l*. The net cost of moving into the new rooms, and decorating, fitting them up, and furnishing, was just over 40*l*., the whole of which was defrayed by the voluntary contribution of money, labour, and material of twenty members, whose names were given. The summer outings were in several instances remarkably successful, specially noteworthy being the visit, by kindness of Sir Frederick Edridge, in May, to the new Town Hall, and the excursions to Hatfield House, Greenwich College, and to the country residence of the distinguished amateur, Mr. A. R. Dresser. The report also sketched an important and attractive programme of coming events. On the motion of Mr. Waller, the report and balance-sheet were adopted *nem. con.* The President moved a special paragraph appreciatory of the valuable services rendered to the Club by the retiring Hon. Secretary, Mr. H. E. Holland, which was carried amid loud applause. Mr. Waller then took the chair whilst a President was elected for the year. On the motion of Mr. James Packham, seconded by Mr. J. Smith, Mr. Hector Maclean, F.R.P.S., F.G.S., was unanimously chosen, for the eighth year in succession, as President. The election of the following was proceeded with:—*Vice-Presidents:* His Worship the Mayor (Councillor Martin Luther Moss), the Right Hon. C. T. Ritchie, M.P., Sir Frederick Edridge, P.P., and Mr. James Glaisher, F.R.S.—*Treasurer:* Mr. H. E. Holland.—*Hon. Secretary:* Mr. L. G. Kough, 122, Birchanger-road, South Norwood. The old Council was, on the proposition of Mr. Roffey, seconded by Mr. Underhill, unanimously elected. Votes of thanks for various services rendered were passed to Messrs. Waller, Kough, Puzey, A. Jenkins, and Isaac. *Council:* Messrs. Burn, Hirst, Isaac, A. Jenkins, W. G. Jenkins, Linton, J. Noaks, Packham, Rogers, J. Smith, Watson, and S. H. Wratten. Messrs. A. Potter and E. G. Ley were elected members of the

Club. There was a special display of prints by members and others, including works by Messrs. Bender, Corden, Hirst, Puzey, Maclean, Puyo, Le Begue, Von Gloeden, and Craig-Annan. Mr. Waterall offered a valuable prize for competition amongst members. Mr. Puzey presented the Club with four finely rendered framed prints of portions of Hatfield House. Mr. Maclean showed various interesting objects, amongst them being Tylar's newly patented printing frame, a cheap, simple, and improved pattern, which met with general approval, as also did prints he showed upon extra rough Whatman bromide paper (Wellington & Ward), and a paper negative, with print therefrom, upon paper also made by the last-named firm.

Leytonstone Camera Club.—February 10, Dr. Turner in the chair.—Mr. John Carpenter was to have given an evening on

FLOWER STUDIES AND HOW TO MAKE THEM.

In his unavoidable absence, Mr. A. E. BAILEY (the Hon. Secretary) dealt with the matter from the lecture and slides kindly sent by Mr. Carpenter, who said few subjects at first sight seemed more fascinating and less difficult than flower studies, but in the photograph, however skilfully manipulated, we miss the charm of colour and the delicacies of tone which cannot be rendered by our art. He found it a much easier task to produce a passable picture than to impart to others the necessary knowledge of how to proceed. It was not all flowers that are exactly suitable. He found that the well-known flowers, such as the primrose, rose, lily of the valley, &c., take the eye at once, while the varieties are not appreciated. White or cream, pink and blue, gave the best results. As regards arrangement, a great deal must be left to individual taste and judgment, but the more simple the grouping the better. Supposing your group is placed in a vase, the flowers must be as much on one plane as possible, otherwise it will be difficult to get the whole into focus. Some growing plants, such as chrysanthemums, lilies, &c., make nice photographs, as they are naturally grouped, and not so formal as if placed in a vase. The light should be the strongest from one side, as in portraiture. Any dark background may be used. As regards plates, he always used isochromatic, and was satisfied that they were indispensable for this class of work. Pyro ammonia was his favourite developer. Give a full exposure, and commence development with a minimum of pyro, say, one grain to the ounce. It was not easy to give any rules for exposure, as so much depends on the light, time of day, and season of the year, &c. He would advise a trial plate or two, which would not be time wasted, and, to sum up, the chief points are: suitable subjects; careful arrangement, with judgment as regards composition; good lighting, preferably from one side; isochromatic plates; weak developer; moderately small stops; full exposure; and a fair amount of refined taste. A vote of thanks concluded a most successful and instructive evening.

Polytechnic Photographic Society.—February 11.—The members present found plenty to talk about, and the meeting was not closed until 10.15 p.m. For beginners, a plate was exposed and developed. This series for beginners will be continued each Thursday from 7 p.m. to 8 p.m., and any particular branch of photography will be performed, if a few days' notice is given the Hon. Secretary. Thursday, February 25, at 8.15 p.m., Mr. A. A. K. Tallent will, with the aid of a triple lantern, explain the three-colour process.

Birmingham Photographic Society.—February 9.—A demonstration upon

THE DEVELOPMENT OF CARBON PRINTS

was given by Messrs. HAROLD BAKER and E. C. MIDDLETON. Mr. MIDDLETON explained the theory of the process and the practice of sensitising the tissue. The bichromate of potash solution, used for this purpose, he said, might be anything from two to five per cent., according to the character of the negatives to be printed from, a weak solution being most suitable for thin negative and a strong one for strong negatives. As many samples of bichromate of potash were found to be acid, and acidity produces insolubility of the tissue, it was recommended to add ammonia until the solution assumed a lemon-yellow colour. Drying of the tissue should be complete in about four or five hours, but should not be carried so far that, upon an attempt being made to roll up, the tissue cracks. Tissue which was very dry would print very slowly as compared with tissue which allowed of easy handling owing to its not being "bone dry." The principle of the various actinometers being explained, Mr. BAKER then demonstrated the squeegeeing of a print upon single transfer paper and upon waxed and collodionised opal as a temporary support, using a roller squeegee for the purpose. Development afterwards followed when the prints had remained under pressure for a few minutes. The results were extremely satisfactory, and, after many questions had been asked and satisfactorily answered by the demonstrators, the meeting was concluded.

Liverpool Amateur Photographic Association.—February 11, the President (Dr. J. W. Ellis) in the chair.—Mr. J. A. SINCLAIR, F.R.P.S., of London, one of the hon. members of the Association, gave a very interesting demonstration on

THE ARTIGUE PROCESS.

This is a comparatively new and little-known carbon printing process, differing from ordinary carbon in many ways, the principal ones being, firstly, that there is no reversal of the image, so that the trouble of making a reversed negative or of resorting to double transfer is done away with; and, secondly, the mode of development, which is effected by means of very fine hard sawdust mixed with water to about the consistency of peasoup. This mixture is poured over the undeveloped print a number of times, and by means of friction (the tiny grains of sawdust acting as a kind of a file) wears away those parts which have not been acted upon by light when printing under the negative, leaving the finished picture upon the paper support. The demonstrator treated the matter very fully, and successfully developed some examples, one of which had been printed in the train on his way from London. Several framed prints of his own work were handed round and much admired. A hearty vote of thanks to Mr. Sinclair concluded a very enjoyable technical evening.

Plymouth Photographic Society.—Before the Plymouth Photographic Society last week Captain EVANS, R.M.L.I., lectured on

MILITARY PHOTOGRAPHY AT HOME AND ABROAD.

Photography was, he said, used in the service to a much greater extent than was generally imagined. Its use by the military at home is almost entirely confined to the Royal Engineers, whose headquarters are at Chatham. Classes are formed annually, and officers of other regiments are sometimes admitted. One of the uses to which the R.E. put photography is the production of the ordnance survey. The gunnery school at Shoeburyness use photography in ascertaining the effect on guns and carriages of the explosion of the powder charge, and in recording the results of experiments with projectiles and targets. The Intelligence Department of the army make a large and varied use of photography in gaining information and in recording it. Officers employed on secret services, anxious to obtain a picture of a jealously guarded fortress, know that it is no use to point a camera directly at it, but by an arrangement of prisms it is possible to take a photograph round the corner, so to speak. A naval officer once told the lecturer that he obtained valuable photographs of foreign ports by means of a detective camera concealed under his coat. A story goes that an Intelligence officer gained news of a place guarded with such extreme care that people with cameras were not allowed within miles of it. Disguising himself as a German nurse, he wheeled a perambulator in which was a cleverly devised dummy infant. In the body of the dummy was concealed a camera, the movements of which could be controlled by hand without attracting attention. The use of photography in the service abroad does not date back many years. The old wet-plate process did not lend itself either to rapidity of work or convenience of transport. During the Crimean War a photographer, who accompanied the allied forces, got himself very much disliked by the transport people, for his baggage consisted of thirty-six large packing cases and a contrivance something between a Pickford's van and a bathing machine. Now that dry plates are brought to such a pitch of perfection, photography as an aid to the soldier is gaining ground; but to obtain the full advantage of its aid a print must be obtained quickly. It ought to be quite possible to place copies of the sketch handed in to-night in the hands of every one of the officers commanding companies at to-morrow's parade. For military-service work, the Ross photoscope and the Stereoscopic Company's binocular hand camera seemed to be the best. Celluloid cut films in double back slides were to be commended. It might be necessary to send a film back at once to be developed, and that would be impossible in the case of a Magazine camera. The chief use of photography in the service was as an adjunct of reconnaisance, perhaps the most important part of the art of war. By it the general officer commanding obtains information of the country he has to travel, the movements of the enemy, how to take precautions against surprise and sudden attack, how to arrange beforehand for the safety of his forces while on the march, and about his camp places. Of special use was photography in the reconnaisance of a road, a river, or a village. Without its aid the officer would illustrate his report with a freehand sketch. Some, however, could not draw, and shirked it; others could draw, and enlarged it, to produce a pretty effect. A camera, however, recorded only what it saw. It also took some of the surroundings of the object, making the picture more useful, and would indicate the material of which bridges, houses, &c., were built. On return to the camp the negatives would be made, and while the wet bromide prints were drying the officer could complete his report. Photography had been used by the balloonist. During the siege of Paris, Nadar, the celebrated aeronaut, by means of reflectors and other scientific instruments, gained important information about the movements of the Germans. Having exposed the plate, he sent it down to earth by means of the rope which held his balloon captive. There it was developed and the position of the enemy revealed. During the siege of the same city, dispatches and plans which had to be sent out were by the aid of photography so reduced that sixteen pages of printed matter were produced on a collodion film weighing less than a grain. These dispatches and plans were forwarded by pigeons, each taking twenty films, and more than 100,000 of those films were sent out of Paris during the siege. When these photographs reached their destination they were thrown on a screen and read. Dr. Blankhanot had invented a process by which plates may be developed by pure water, the plates having previously been immersed in the following solution and allowed to dry in the ordinary temperature:—Pyrogallic acid, 10 parts; salicylic acid, 1 part; dextrine, 10 parts; alcohol, 4 parts; and water, 20 parts. This might be found useful when baggage was limited and ordinary developers were not available. On the motion of Mr. W. AVER DUNCAN, seconded by Mr. H. J. HISSETT, and supported by Mr. E. H. MICKLEWOOD, the President, Captain Evans was heartily thanked. There was a large attendance of members and visitors.

FORTHCOMING EXHIBITIONS.

1897.	
February 19–27	Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.
,, 25–27	Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.
March 6–13	South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
April 3–May 1	*Edinburgh Photographic Society. Hon. Secretary, J. S McCulloch, W.S., 2, George-street, Edinburgh.
,, 19	Beverley Photographic and Sketching Society. Hon Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Patent News.

THE following applications for Patents were made between February 3 and February 10, 1897 :—

CAMERAS.—No. 2633. "Improvements in Photographic Cameras." W. R. BAKER.

DEVELOPING APPARATUS.—No. 2911. "Improvements in Apparatus for Developing Photographic Plates." W. BROOKES.

HOLDING PHOTO-LITHO PLATES.—No. 3004. "A Foundation for Holding and Supporting Metal or other Plates used for Lithographic, Photo-lithographic, and other purposes." C. G. BENNETT.

SCREEN KINETOSCOPY.—No. 3097. "Improvements in Apparatus for Photographing Successive Pictures of Moving Objects upon a Moving Strip of Transparent Film, and for Projecting Pictures so taken." A. V. WORTLEY.

VIEW-FINDERS.—No. 3103. "Improvements in View-finders for Twin Lens or Divided Cameras." W. STANBURY.

COLOUR PHOTOGRAPHS.—No. 3121. "Improvements in Photographs with Colour Effects and in the Method of Producing same." G. J. SERSHALL.

CAMERAS.—No. 3232. "Improvements in or relating to Photographic Cameras." F. E. IVES.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE PHOTOGRAPHIC COPYRIGHT UNION.

To the EDITORS.

GENTLEMEN,—Referring to your paragraph in your issue of January 22, p. 50, a statement is made as follows :—

"More than once lately we have been made the confidants of allegations similar to the foregoing, directed against some members of the Photographic Copyright Union, who, although under agreement not to allow their copyright photographs to be reproduced for a smaller fee than 10*s.* 6*d.* each, yet are alleged to have given way on the point, and accepted considerably lower fees."

The Committee of the Photographic Copyright Union think that any one who does not first communicate such facts as stated, to them, is no friend to the interests of photographers generally, nor to the Photographic Copyright Union in particular. The Committee are keenly interested in any breach of their rules, and are prepared to investigate any infringement which is brought to their notice.

It has occurred that members, through forgetfulness of the alteration made in the rules since the formation of the Union, have committed unwittingly a breach of the later regulations, but it has been found invariably that, when this is pointed out, the member has immediately promised to conform to the regulations which he has agreed to.—I am, yours, &c., HENRY GOWER, *Secretary.*

Botolph House, Eastcheap, London, E.C., February 10, 1897.

[We hope the Committee of the Union will be supported in their determination to enforce the rule with regard to the minimum fee.—EDS.]

MR. F. C. LAMBERT AND THE ROYAL PHOTOGRAPHIC SOCIETY'S COUNCIL.

To the EDITORS.

GENTLEMEN,—As one who voted for Mr. Lambert as a member of Council for the Royal Photographic Society, I should like to say that I did so because I think he is a gentleman—personally and otherwise—qualified to act in that capacity. As to the Photographic Salon being hostile and antagonistic to the Society, I fail to see what grounds you have for such a statement. Why should there be hostility or antagonism between two photographic societies, especially like the Salon and the Royal, which work on different lines? I enclose my card.—I am, yours, &c., "FREEDOM."

P.S.—Of course Mr. Lambert does not think the two positions incompatible, otherwise he would not have stood for election. Why do editors of papers stir up so much strife?

[We have been much gratified to find that several members of the Royal Photographic Society have approved our action in drawing attention to the fact that a member of the Salon Committee has permitted himself to be elected to serve on the Council of the Royal Photographic Society. Replying to "Freedom," we need hardly point out that Mr. Lambert's personal and other qualities are not in dispute. As to the hostility and antagonism of the Salon to the Royal, we take it that no impartial reader of our pages for the past four years can be in any doubt on the matter; certainly it is not the fault of ourselves, of all men, if the fact has not been made abundantly clear. But this is a subject that we need not labour now.

The point at issue lies in a nutshell. The principal business of the Salon is to hold a photographic exhibition that is managed by a General Committee, which naturally does its best to make the Exhibition an artistic and financial success. Concurrently with the Salon Exhibition is held that of the Royal Photographic Society, managed by *its* Council. Will anybody deny that the elements of rivalry and competition do not arise between the two executives in promoting the success of their respective exhibitions? They cannot well be excluded. Is Mr. Lambert going to hazard the task of serving two masters? The presence of a Salon Committeeman on the Council of the Royal Photographic Society is, to say the least of it, calculated to be embarrassing to his colleagues, and it is to be hoped that Mr. Lambert will choose the obvious means of escape from an unenviable position.—ED.]

COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—May I trespass on your kindness by asking if any of your readers have specimens of colour prints produced by any photographic process which they could lend for exhibition at the Society of Arts, on the 24th inst., when I have undertaken to read a paper on the subject?

I propose that any specimens lent to illustrate the paper should remain on view for a few days afterwards, and I am anxious to make the collection as complete as possible.—I am, yours, &c., H. T. WOOD.

Society of Arts, John-street, Adelphi, London, W.C., February 16, 1897.

RE DAGUERREOTYPE NEGATIVES!!

To the EDITORS.

GENTLEMEN,—Your contemporary evidently copied its editorial paragraph from an erroneous report which appeared in a local newspaper. I fear that the fault lies with our reporter. Mr. Roland Whiting I should have thought, was too well known for you to have attributed such a statement to him; he is, I believe, one of the few gentlemen now living who have taken photographs by Daguerre's process.

Personally, too, I should hardly have passed the report had I seen it, for I have a rather large collection of Daguerreotypes, and know how futile it would be to attempt to print from any of them.

Of course, what should have been reported, and what Mr. Whiting said, was that the prints were made from negatives which had been made from Daguerreotypes believed to have been made by Mr. Ruskin.—I am, yours, &c., R. Y. MURPHY, *Hon. Sec., Ealing Photographic Society.*

7, *Argyle-road, Ealing, W., February* 16, 1897.

To the EDITORS.

GENTLEMEN,—Will you allow me to correct a statement which you make concerning me, and which forms the subject of a leaderette in your last issue?

I am credited with having shown prints made from Daguerreotype *negatives*, whereas the facts of the case are that the prints shown by me were made from *wet-plate* negatives, copied *from* Daguerreotypes. The copies were made for Mr. Ruskin, and it is *believed* that the Daguerreotypes were produced by that gentleman himself.

I think, also, I can hardly be included amongst "modern writers," since it is now considerably more than ten years since I first took to writing and lecturing upon photographic matters; and, furthermore, as regards knowing nothing about the process alluded to, the mention of the fact that I have myself produced Daguerreotypes is sufficient to remove that charge from me.

At the same time, I am sorry that a statement, which is obviously either a clerical or a printer's error, should have crept into any paper and be commented upon in the manner in which it has been.—I am, yours, &c., ROLAND C. WHITING.

18, *Kent-terrace, Brent Hill, Hanwell, W., February* 15, 1897.

[Our remarks were, of course, directed at the writer who had credited Mr. Whiting with talking of Daguerreotype negatives, and not at Mr. Whiting himself, whom we know to be a practical photographer, most unlikely to perpetrate such a photographic "bull."—EDS.]

ELECTRICAL UNITS.

To the EDITORS.

GENTLEMEN,—In the LANTERN RECORD of January 1, 1897 (which owing to press of business, I am only just perusing), is an article on

A New Departure in Electric Lantern Work, by Cecil M. Hepworth. The following is an extract from this article:—

"It must be remembered that electrical power is measured in watts, or perhaps a more familiar term is the Board of Trade 'unit,' which is a thousand watts, and is therefore sometimes called a 'kilowatt.' . . . . Thus a current of five ampères, at the usual pressure of 100 volts, represents three pennyworth of electricity, taking the average price of sixpence per Board of Trade unit as the basis of the calculation; for five ampères, multiplied by 100 volts, equals 500 watts, which is half a unit."

I hope that the time is not far distant when people who think that a Board of Trade unit is a kilowatt, and that "a current of five ampères, at the usual pressure of 100 volts, represents three pennyworth of electricity," will at least refrain from publishing such views in the photographic press.—I am, yours, &c.,

T. H. Pope.

South-street, Ponders End, February 15, 1897.

CRAIG ANNAN AT THE CAMERA CLUB.

To the Editors.

Gentlemen,—Will you kindly allow me to inform your readers that the Exhibition of Mr. J. Craig Annan's photographs at the Camera Club will be continued until Tuesday, March 9, inclusive? The Exhibition is open to visitors from 2 p.m. to 5 p.m., daily; cards of admission may be obtained from members, or upon application to me.—I am, yours, &c.,

F. Seyton Scott, *Secretary.*

Camera Club, Charing Cross-road, W.C., February 13, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

J. Palmer Clark.—Scarcely in our line; thanks all the same.

T. Morley Brook.—An oversight which we have elsewhere rectified.

W. H. Stoneman.—Many thanks for your letter and the cutting referring to Institute of Photographic Artists.

Senex.—You have probably kept the paper in too warm and dry a place, under which conditions we have experienced the same phenomenon.

Photogeorgos.—The numbers and the volume have long since been out of print. By advertising, you might obtain the volume, which would probably cost about 10*s.*

H. W. Kennedy.—Apply to Messrs. Thorne & Hoddle, 169, Camberwell New-road, S.E. The process of making calcium carbide is hardly one for the users of "small quantities."

H. T. Morton.—The question is somewhat vague. State precisely how you are working, and in what direction you are seeking for improvements, and we may be able to help you.

Lubricant for Burnishing Prints.—Emily Shaw. Dissolve five or six grains of Castile soap in an ounce of alcohol and rub over the print before burnishing, or a piece of flannel, rubbed over a lump of the soap, and then well rubbed over the print, is the method adopted by many.

Negative Paper.—Negative. In the old days it was considered that waxing the negative helped to get rid of the grain of the paper, as well as shortening the time of printing; but with modern papers this does not seem to be the case, except that the waxing will make the negative print a little quicker.

Enlarging by Artificial Light.—W. Biddle. The diameter of the condenser must be equal, or, in practice, a little larger, in diameter than the negative to be enlarged when it is measured diagonally. Thus, for a half-plate, $6\frac{1}{2} \times 4\frac{1}{4}$, it should be, say, eight and a half inches to give good illumination all over.

J. L. Allen.—We fear we cannot help you. There has not for some years been published any reliable information on the subject. Possibly your best plan would be to procure a copy of Abney's *Photography with Emulsions*, which gives many useful and reliable formulæ. There is not, we may remind you, a degree of 50 on the Warnerke scale.

Eurasian.—Possibly your best plan will be to write Messrs. Adams & Co., 26, Charing Cross-road, London, W.C. We believe they keep the material, and can give you the information you seek. If we referred you direct to the maker, we are afraid you would experience some difficulty in getting what you want—at least, that has been the experience of others.

Carbon Printing.—S. W. S. It is obtainable from Messrs. Adams & Co., Charing Cross-road; you will all obtain information about it from them.

Exile.—For washing the negatives after development and fixation, we should think the water would answer without producing any ill effects. We do not know whether we have grasped your question aright; if not, write again.

Obscuring Light.—E. E. S. says: "Kindly inform me what is the best paste to use for subduing the light in the studio, and oblige."—Mix some weak starch paste, as for mounting prints, and add a little whiting, and stipple that on the glass. In making the paste, it is a good plan to mix the whiting intimately with the dry starch before adding the water.

Spotting.—Spotter. "Can you tell me the best spotting medium to use for P.O.P., so that the paint will take easily on the gelatine surface and not show after burnishing? Your courtesy in answering questions must be my excuse for troubling you on so simple a matter."—Ordinary water-colours to match the tone of the print, mixed with albumen as a medium. Lubricate the print with Castile soap in alcohol, and do not use too much heat.

Acetylene for Portraiture.—C. M. Barstow says: "1. Can you inform me if acetylene gas be sufficient illumination for taking figures in a room? The window would have to be blocked, as the sitter would be against it. 2. If your answer is favourable, could you tell me where I should apply for estimates, &c.? I may tell you that it is not to be a professional studio, but only for my own work."—In reply: 1. The light is admirably suited for the purpose. 2. Address Messrs. Thorne & Hoddle, 169, Camberwell New-road, S.E.

Developing Bromide Paper.—B. H. says: "I have been reading Dr. Just's new work (4th edition) for enlarging and printing on bromide paper, &c. On pages 78 and 79 he describes the beautiful results that are to be got on chloride paper, by one or two seconds' exposure to daylight in the soft light of an ordinary room, and developed with ferrous acetate. I take it that this cannot be the ordinary printing-out paper. I should feel obliged if you could in your next issue give particulars of this paper, and where obtained."—In reply: Our correspondent is, we think, under a misapprehension. On reference to Just's book it appears that he is writing of the development of *bromide* paper.

G. S. says: "1. I have a number of glass plates with gelatine films, many of them with carbon tissue on them. How can I clean them? I know there is an acid recommended for the purpose. What is it? and how do I use it? 2. In mounting some opalines (silver prints, stuck face on to glass with pure gelatine) on plush with glue, described as best Scotch, I note many white stains on face of print, where glue has touched the back. What is the cause of this?"—1. Soak the plates in a solution of American potash. Sulphuric acid diluted with water will also answer. 2. Evidently the glue has had some pernicious action on the silver print. Common glues should be avoided for photographic purposes.

W. Goodman, of 30, Wellington-terrace, Falmouth, writes: "I was much interested in your article, January 29, on *Novelties in Photographs*. I have for some years (as an amateur) sent off photographs of my own as Christmas cards, &c., and also used the enclosed visiting card. The like, I think many would use, and I think it would be a much more profitable business speculation than even stamp photographs, and any one successfully using the photo-autocopyist could reproduce them with greater uniformity. By the way, is the above used professionally? I mean, can one get the blocks produced for them? I shall be pleased to send copy of card to any reader, if you are disposed to use this."—In reply: Half-tone block makers will supply such blocks.

Studio.—Rogo says: "I should feel grateful if you could tell me if side light of proposed studio (sketched below) would be large enough to do good commercial work (up to groups of four or five). A is the building I wish to make into studio, B an adjoining building, which only allows a side light of eight feet possible, and, no doubt, would interfere to some extent with even that by blocking the light. Room is about six or seven feet high to where roof commences, about fourteen feet wide, and any quantity of top light is possible. At about seventeen feet away are some buildings same height as A."—Before giving an opinion on the question, we should like to see a fuller sketch, as we are not at all clear upon the one sent. From that it would seem that the light would be very restricted indeed, and not at all suited to professional purposes, for groups. But send us a fuller sketch and more particulars.

Enlarging.—A. J. A. X. writes: "Your advice on the following points will be esteemed a favour. 1. In enlarging from 11×9 negatives to 22×18, I have three available lenses—(*a*) Ross's *f*-9 wide-angle symmetrical (to cover 15×12); (*b*) Ross's *f*-12 doublet; (*c*) Ross's Goerz *f*-14 aplanat. Which would be the best lens to get fine definition all over? 2. Putting a negative into the camera, reversed, to be used as the enlarging apparatus, in a completely darkened room, except the daylight which comes through the lens from outside at respectively nine inches, twelve inches, and fourteen inches focus, at what respective distances should the receiving paper or plate be placed to get a well-defined 22×18 result? 3. In making a reversed negative from a carbon transparency positive, is it best to use a slow, medium, or quick plate—say, of Mawson & Co.'s Ordinary, Castle, or Mawson plate? Though I have had thirty years' work on collodion and gelatine negatives and printing from them, I have never yet tried my hand at enlarging, but think I could get some good 22×18 reversed negatives to print on rough support carbon tissue if I have sufficient data to start work upon."—1. The lens quoted as (*c*) will be the best to use. 2. On page 1014 of the Almanac you will find a table giving distance for any degree of enlargements. 3. An ordinary or slow plate. We, on the whole, prefer the slow plate for the purpose.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1921. Vol. XLIV.—FEBRUARY 26, 1897.

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EX CATHEDRÂ.

Sir Henry Trueman Wood's paper, on *The Production of Colour by Photographic Methods*, read at the Society of Arts on Wednesday last, February 24, after glancing at the work of the earlier experimenters in colour photography, dealt fully with the interference method of Lippmann; the three-colour process on glass; and the diazotype process of Messrs. Green, Cross, & Bevan. Of the colour process of M. Chassagne, which formed an important section of the paper, the lecturer added practically nothing of importance to what he has already published with regard to it. We elsewhere give an abstract of that portion of the paper which has the more immediate interest, and which includes references to some recently published theories relating to the reproduction of colour by photography.

* * *

The Annual General Meeting of the Photographers' Benevolent Association will be held this (Friday) evening, February 26, in the rooms of the Royal Photographic Society, 12, Hanover-square, W. During the year the work of the Association has been entirely in abeyance, although, according to the report, "there has been much destitution amongst photographic assistants, and we have had many urgent appeals, to which, with great regret, we were obliged to turn deaf ears. We have felt that, as considerable legal and other expenses are almost inevitable before we can make the trust fund (pension fund) available for the purposes of the Association's general work, we were not justified in spending the small available balance."

* * *

The report continues: "Our efforts in the direction of rendering this fund available have been thwarted by circumstances over which we have no control, and we felt we had no choice but to await developments. We have now good prospect that the conversion of the fund may be accomplished, and it is therefore most important that we should have a full annual meeting, in order that the plan we shall lay before you may be carried into effect. If this can be done, there is every prospect that the work of the Benevolent may be continued more satisfactorily than ever in the past." We earnestly hope that the Committee's strong appeal may result in the attendance they ask for, so that means may be devised for unlocking the pension fund, and making it available for the work of the Association.

* * *

In our reference, last week, to the proposed Technical and Trade Exhibition to be held under the auspices of the Royal Photographic Society next spring, we omitted to make mention that it will be of an international character. Of course, the annual Exhibition of the Society is, in reality, an international one, exhibits usually coming from the Continent and America; but, as regards the Trade and Technical Exhibition, special efforts will be made, we believe, to attract from abroad exhibits in those special departments of photography which it is the aim of this Exhibition to illustrate, viz., apparatus and technical photographs. Hence it is desirable that the fact of the Exhibition being international should be emphasised.

* * *

We are informed that letters of allotment and letters of regret in respect to the Thornton-Pickard Manufacturing Company, Limited, were duly posted a few days ago. Preference was given to customers, and, although the capital was considerably over-subscribed, the Company endeavoured to give photographers as full an allotment as possible.

The specimens used to illustrate Sir H. Trueman Wood's paper on colour photography at the Society of Arts will remain on view at the Society's rooms, John-street, Adelphi, on Friday, February 26, from 11 to 5, and on Saturday, February 27, from 11 to 2, when they can be inspected by any one introduced by a member.

* * *

Mr. Frank Haes, of 28, Bassett-road, W., writes: "Would you oblige me by inserting a query in The British Journal of Photography asking if any one has, or can tell me where to obtain, prints of scenes in Tangiers, Mogador, and other towns in Morocco; they are required for reproduction in a paper if arrangements can be made for the right of so doing." If any of our readers can give Mr. Haes the information he seeks, perhaps they will communicate with him direct.

* * *

We may remind our readers that the meeting of the Photographic Club, to be held at Anderton's Hotel, Fleet-street, E.C., on Wednesday, March 3, is a Trade Night. Manufacturers and dealers wishing to exhibit novelties are requested to communicate with the Hon. Secretary, Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.

* * *

Adverting to our last week's remarks on the action of a provincial contemporary in adopting the cheap enlargement scheme, Mr. T. Birtles of Warrington writes us with reference to a gentleman of whose portrait an enlargement was to have been exhibited by a contemporary as a local "draw."

"I may just say that Mr. T. Morris is the manager of the largest iron-making works in the world, and has 3000 men under him. In addition to this, he is the most popular man in Warrington. It was a good stroke on the part of the local editor to try and get his portrait to start the local show with. I am glad to say that up to now, no public man has ever exhibited, or sent a picture to be copied, as far as I know."

* * *

The following is a copy of the spirited epistle of Mr. Birtles which had the effect of deciding Mr. Morris to withhold permission for his portrait to be enlarged for exhibition purposes:—

"You will excuse me when I tell you what I think about the matter. Your portrait would be a splendid advertisement for them, you being one of the most popular men in the town, for which they will give you the portrait of yourself. If you remember, this portrait was copyright when you sat to me, and I can claim the right. If the proprietors of the newspaper want your portrait, let them take a negative of you, as they have gone into the photographic profession; they will then show what they can produce. This enlarging of other people's work goes to Liverpool, and, by lending yourself to it, you are injuring the Warrington photographers thereby. I don't think you would expect this. If you will excuse me saying as a photographer, I think the newspaper people might do better by looking after the interest of the printing of the paper and its usefulness, instead of photography, a new business to them."

ABOUT ANGLES OF VIEW.

It would seem almost a work of supererogation at the present time to say anything on the topic of the view angles of photographic lenses, and what is meant by the terms, "wide angle," "narrow angle," &c. Yet, notwithstanding all that has been written on the subject, there still seems to be a considerable misconception on the matter. That this might be the case with novices, who have not made themselves acquainted with elementary optics, would not be surprising; but it becomes so when we find even those who may be considered experienced workers still ignorant as to what is meant by a wide-angle lens. For example, only the other day, in conversation with a professional photographer of many years' standing, about the new anastigmatic lenses, he expressed his disapproval of them because they were wide-angle lenses, and he did not like wide-angle pictures.

Again, a week or two back, an amateur of some experience wrote to the effect that, as the lens on his hand camera did not include enough subject on the plate to please him, he procured a wide-angle lens of similar focus, and was surprised to find that it took in no more subject than the other did; and queries on similar points are being constantly replied to in the Answers column. All this makes it necessary to once more explain that there is no difference whatever between an ordinary angle and a wide-angle lens, except that the latter has the property of covering a larger plate, in proportion to its focal length, than the former.

Taking up the catalogue of one of the leading London opticians, we see that there is quoted, in the list of ordinary lenses, one of thirteen inches focus to cover a 10×8 inch plate. We mention this particular lens because, in the wide-angle list of the same optician, there is one of identically the same focus (thirteen inches) to cover a plate 18×16. If this lens were used on the 10×8 plate, precisely the same amount of subject would be included as by the other, and no more; or, if the ordinary lens, by stopping down, could be made to cover the 18×16 plate—and, with a very small stop, it probably might be—it would then be as wide an angle lens as the other, and would embrace exactly the same amount of subject. Not long ago we were photographing an interior, using a 12×10 camera, but we found that the lens with which it was fitted (sixteen inches focus) did not include all that was desired. We happened to have with us, however, a whole-plate, one of eleven inches focus. This, with a very small stop and judicious focussing, was made to cover the 12×10 plate, and it then became a wide-angle lens to all intents and purposes.

The use of wide-angle lenses, when employed as such, is to be deprecated, except in the case of confined situations, where the camera cannot be taken farther back, as in the case just referred to, because the perspective, though not distorted, is too violent to be pleasing. Lenses capable of covering a large field in proportion to their focal length—*ergo*, wide-angle lenses—are a power at command, but they should be used with discretion, and with that only. Because the new anastigmatic lenses cover a large field, and thus may be classed as wide-angle lenses, is no reason why they should always be employed as such by using them up to their full capabilities on smaller plates they are equivalent to ordinary lenses of the old form, but with better optical qualities.

What, it may be asked, is the most desirable angle to include in a photograph? Taking the lenses now most in vogue for outdoor work, those of the ordinary rectilinear or symmetrical type, we find that for the half-plate picture a lens of eight and a half inches is generally used, and, for the whole-plate, one of eleven inches focus. Now, the angle given by such lenses is a very pleasing one when the pictures are seen at the ordinary distance, but the angle is by no means great, as, when the

rints are trimmed, they include less than 40°, and it is oubtful if that angle should be very much exceeded for ictorial purposes. If the base line of the photograph equals he focal length of the lens, the angle included will be 53°, nd this is about the limit we should go to, as much beyond hat the perspective becomes unpleasant. If the base line of he picture is one and a half times the focus of the lens, the ngle embraced is 74°, and, if twice its focus, 90°, and this olds good, no matter what form of lens is used or what name t may be known under.

While on the subject of angles, it may be as well to refer to enses for stereoscopic work, about which we have had queries of late. As a rule, stereoscopic pictures include a less angle han other photographs, though there is no reason why they should. The lenses that are now commonly used are ordinary quarter-plate lenses, probably because they cover the plate well with a large aperture. As these lenses are usually about five and a half inches focus, and the base of the trimmed picture about two and three-quarter inches—or half the focal length of the lenses—the angle embraced is very narrow—less than 30°. It really becomes equivalent to employing an eight-and a half inch focus lens to take a quarter-plate picture with. If we desire the same angle in our stereoscopic pictures as is so generally approved of in other photographs—say, a trimmed whole-plate, as taken with a lens of eleven inches focus—the rule of proportion shows that the focus of the stereoscopic lens should be about three and three-quarter inches, and not more.

Increased Sharpness in Fluorescent Screens.—According to M. Radignet in a paper presented to the Paris Academy of Sciences, with screens of glass (especially that from the manufactory of St. Gobain called *crystal*) enamel, or porcelain, instead of the usual cardboard ones coated with fluorescent crystals, the Röntgen-ray images, though less brilliant, are much more sharply defined.

Sciography of Soft Animal Tissues.—A paper on this subject has recently been presented to the Paris Academy of Sciences by MM. Remy and Contremoulins. Silver chromate is deposited by a preliminary chemical treatment on the surface and in the tissue of the muscles. In this way photographs can be obtained by means of the Röntgen rays, in which not only the muscles, but even the muscular bundles, are clearly visible. It will, of course, be understood that the reference is not to the living body, but to parts of a dead subject prepared for anatomical examination.

Impure Shellac.—The complaints that are sometimes made of the imperfect character of varnishes made with shellac and methylated spirit may possibly be explained by a fact recently published by Herren Ulzer and Defris in a foreign chemical journal. According to these experimenters, there are to be found in commerce samples of so-called shellac which are composed of shellac and common resin. We do not remember to have met with any such samples; but, granting they are sold in some places, it is easy to see how a varnish made from them would be deficient in that hardness and tenacity which are specially characteristic of true shellac.

More about Kites.—We have recently brought under our readers' notice the probability of the successful adaptation of a camera to a kite, and a recent adventure of a United States army officer shows that we have under, rather than over, rated the carrying capacities of these aerial messengers. By a modification of the Hargreave pattern, Lieutenant Hugh de Wise, using four kites weighing about sixteen pounds each, actually had himself, voluntarily, taken up in the air to a distance of about forty-two feet. The four kites were held in pairs by one-inch cords, which were attached to an iron ring held by half-inch Manilla cord. Lieutenant Wise was attached by suitable means to the iron ring, and, although the wind was blowing fifteen miles to the hour, he remained for some time in his elevated position examining his surroundings with a field glass. What he could have done with a camera, either at that or a greater elevation, needs no words to describe.

Photography to the Rescue.—A contributor has drawn our attention to a singular statement in a scientific paper, and asks whether, if our reading of it be the same as his, photography could not be called to give evidence as to the truth or the reverse of the statement in question, which is here given. It appears in *Nature* (p. 260, current volume). Treating of a paper by Dr. John Beddoe, on "Selection in Man," the editor summarises the paper thus: "From the facts he advances, it seems that dark-complexioned men have a bias towards sedentary and indoor employments, while a certain number of the blonde type prefer the outdoor employments connected with the land or with the care of animals. The statistics he gives support the conclusion that, in this country, more criminals than honest men are of dark complexion." We quite read this, with our correspondent, as alleging that, given, say, 1000 dark-complexioned men, more than 500 are criminals, and less than 500 are honest. Let our photographers examine their negatives, and, if, as we feel sure will be the case, their statistics disagree with Beddoe's, let all the dark-complexioned ones do their best to resent his statements.

The Correct Use of Cloud Negatives.—It will, perhaps, have been noted that the writer of the article on "Cloud Photographs" in *Nature*, recently reprinted in these columns, states that "the photographer does not always wish to reproduce the actual state of the sky at the time his photograph was taken. He thinks he can produce a better artistic effect by employing clouds of his own manufacture," &c. We do not think the writer intended to suggest the desire to adopt the old smoked-glass or cotton-wool work; he clearly refers to the usual "printing-in" of clouds. Of this, when done with taste and correctness, there can be no complaint. Of course, it is understood that due regard be had for analogous illumination of cloud and landscape, as otherwise the effect would be grotesque. There is, however, a further caution that may be given in this connexion; it is contrary to nature to print, as is sometimes done, the very lowest portion of a cloud negative—that part showing clouds almost touching the horizon—on to the upper part of a photograph representing for, say, half its height, trees or architectural subjects. Cloud negatives are often taken from an eminence, so as to embrace a wide field of view from the horizon upwards, and the temptation, when a cloud form from the horizon of such a negative helps to balance the composition, to use it thus incorrectly is naturally considerable.

ON THINGS IN GENERAL.

WHAT can be the reason that, when any one poses as an authority on a subject he is insufficiently familiar with, he can usually get along without tripping, but, when the stereoscope, or stereoscopic vision, is the subject concerned, he nearly always has a fall? As an example, we have the article by A. Sawyer, on "Binocular Vision," reprinted from the *Photographic Times* in this month's LANTERN RECORD, abounding in errors. The Editors of the BRITISH JOURNAL OF PHOTOGRAPHY have quickly shown their disagreement with one of the writer's statements, a statement the incorrectness of which cannot be too strongly emphasised, "that two prints from the same negative viewed in this way present a relief and perspective, it seems to me, quite as marked as if produced by two lenses." If this were true, what possible object could there be in having a stereoscopic camera, if one negative from one lens would answer all necessary ends? Mr. A. Sawyer has missed the very essence of the theory almost all through his article. He says towards its beginning, "The principal function of the lenticular

stereoscope is to enable the right eye to see the right-hand picture, and the left eye to see the left picture. Incidentally the lenses may magnify a little, but that is not essential." This is just about as incorrect a statement as could be made. The lenses are valuable if only for placing the eye refraction in accommodation for distant objects, in which condition the optic axes are usually parallel. As to seeing the right picture with right eye, &c., that is done in any kind of vision; what the stereoscope does in that regard is to prevent either eye seeing any but its own picture, and that function is performed by either the stereoscope diaphragm, or by the metal tubes of the lenses when they are used mounted. If this exclusion of a picture for each eye is not carried out, three pictures will apparently be seen, the central one only being stereoscopic.

At the present time, when such close attention is being given to matters of illumination, the extract, in the same paper, from *Invention*, upon the "Meridianal Prismatic Globe," will be read by many. There is no doubt whatever that this globe is an ingenious adaptation of the principle of prismatic reflection, and that it may become a useful adjunct to gas or petroleum light. But too much is claimed for it. Let us read what is said: "Placed over a gas jet . . . . or any other lamp burner, the effect is most remarkable. The flame is softened, and its volume enormously magnified . . . . and the increase in its illuminating power is very remarkable. . . . . With an ordinary globe, a 16-candle-power lamp was reduced to 10·2-candle power. . . . . With the meridianal prismatic globe there was a gain of no less than 41·6 per cent." Now, could anything be more nonsensical than this, if we are to take the assertions as they are written? It is quite possible to so alter the distribution of the illumination from a lamp that, *upon a given spot or area*, the above increase may be brought about; but this can only be done by taking the illumination from one place and directing it upon another. To suggest that the actual amount of light from a given lamp flame can be increased by any external arrangement whatever is as reasonable as to say that perpetual motion is discovered.

What an unfortunate thing it is that the Royal Photographic Society should be subjected to such spasms as have lately been working to the detriment of its usefulness. The great schism that rent it about a score of years ago seems likely to be paralleled again if the really useless agitation that has been exciting it for so long is persisted in. Why cannot the exceedingly temperate and thoughtful letter of Mr. C. H. Bothamley be taken to heart, and its spirit actuate the malcontents? There are plenty of good men outside the Council; but, at the same time, there are plenty in the Council. Why cannot the former bide their time and give their invaluable services without asking for a preliminary Ex Cathedrâ stamp to them? "Everything comes to him who waits."

Let them, for example, try to solve the riddle of the Chassagne photography in colour process. Most of those, so far, who have seen results, at any rate in landscape, do not speak at all flatteringly of it. If they did, I should be inclined to predict that clever conjuring was at the bottom of the matter; but, as, so far, the results are evidently inferior to those already obtained by other processes, why, it is a matter of little importance. I feel extremely curious to learn what will be the result of Captain Abney's suggestion that he should expose a plate on a subject unknown to M. Chassagne, and see what the latter can then produce.

I note that a correspondent has been inquiring whether he may safely make photographic lantern slides from engravings in a book published in 1842. If the engravings come under the Copyright (Works of Art) Act, he may rest content, seeing that that act was only passed in 1862, and its preamble states that "whereas by law as now established the authors of paintings, drawings, and photographs have no copyright in such their works," the first clause sets out that the copyright to be brought about by the Act is for "works hereafter made or sold." If the engravings come under the Talfourd's Act, which was passed in 1842, I may point out that the term of copyright in books is forty-two years, or the life of the author, and seven years, whichever is the longer.

I note another querist asks about using ground glass in his roof. The reply should be that of *Punch* to young people about to marry, "Don't!" When a studio roof is once glazed, it is never desirable to reglaze, but this would be needful with ground glass after a fe years. It is impossible to thoroughly clean this glass when used fo a roof. Eventually it becomes quite yellow, and no amount cleaning will entirely free the surface from the stain.

I was pleased to see the leading article referring to impu mounts, and Mr. Foxlee's method of detecting them. I consid that, at the present moment, the question of defective mounts is paramount importance. I have seen an immense number of picture done by men of the greatest skill, and upon whose work no pai are spared, but which yet have shown, within a short period years, sometimes of months, unmistakable signs of fading, a defe which I can attribute to no other cause than the mounts. Coul not Mr. Foxlee or Mr. Haddon, whose investigations in so man directions have been invaluable, procure a large number of moun from various sources, and give the photographic public an idea, firs as to whether safe mounts are now to be had at all; and, secondl if so, in what proportion. FREE LANCE.

AMERICAN NOTES AND NEWS.

Lack of Grain in Carbon Enlargements.—In a interesting article on the carbon process which Mr. G. Hanm Croughton contributes to the *St. Louis and Canadian Photographe* he tells how the late Mr. Johnson, of the Autotype Company, describe to him the method he adopted to get the colour for his transparenc tissue. It was as follows: After grinding the colour as fine a possible, it was mixed with water and well stirred, then it was left t stand for some hours; the heavier particles settled at the bottom, an only that which was so thoroughly well ground that it remaine suspended in the water was used, and this was obtained by evaporatin the water from it with a tissue made with colour prepared in th manner. There can be no granularity, even when enlarged many hun dred times. In fact, Mr. Croughton says he has seen carbon enlarge ments made from 4 × 6 transparencies enlarged up to 30 × 5 without a trace of texture or granularity.

Smiles.—The *Trade News* advocates the cultivation of smile by professional photographers as a great aid to business success "How many ever cultivate facial expression—I mean those i business life. It is not at all uncommon to feel that we have n reason for looking happy, or making any special effort to appea pleasant to those of our customers whom we wait upon during on of our dark days. We are prone to brood on our own disappoint ments, and, what is worse, to let it show plainly on our faces whe talking to customers, and soon get the reputation of being surly o "grouchy." A man who comes in contact with the public in hi every-day business *must* be an actor, and the actor of greatest ability makes the best impression upon his customers. It should not b considered hypocrisy, and the employee as well as the proprieto should practise facial expression and become sufficiently expert in th trick, so that the moment a customer enters his door he can lay asid his worried look, and go forth to meet him with a bright, engaging expression on his face, as if he had long been waiting for thi opportunity to serve him, and was prepared to exert himself to th utmost to see that the customer got what he wanted."

The Passing of the Portraitist.—Thomas Aquinas, i *Wilson's Photographic Magazine*, demurs to the theory recently propounded in our pages by Mr. John A. Randall that the portrai photographer, as such, is doomed to extinction unless he extends the scope of his business. Photography, he thinks, is too widespread in its applications in the arts and industries for any man or combination to attempt to keep the specialist out by undertaking to do it all. There is abundant room for both, and success for all who recognise their proper places and adequately fill them. The irresistible tendency of the times in every sphere of activity is toward specialisation, but as yet there is no sign of lack of working room for the all-round man. There will always be places where the specialist—portraitist, commercial photographer, radiographer, or any other—may easily find success while his all-round co-worker will starve; and, in like manner, there will always be localities where only the all-round photographer can exist or succeed. We can see this demonstrated in the existing condition of things. In the large cities, where the diversified applications of photography find ample field for business, the greater part of the general photographers grapple with a succession of difficulties in trying to win success. Cut rates and

r prices appear to provide the only means by which business can kept moving. On the other hand, those who are prominent in s or that speciality, famous as portraitists or commercial photo-phers, are generally successful. To this rule there is only one ception, that of the old-established firm, with abundant capital and ipment, able to take up and cultivate all profitable classes of work der one roof, and at the end of the year, by organization and operation of its departments, to ensure a favourable balance on its oks.

The New Lenses in the States.—The title of an article the February New York *Photographic Times*, "Improvements in nses," by Mr. Maximilian Toch, intensified the great disappoint-ent we felt when we had read what the author had got to say on e subject. "Lately," he says, "a new lens has appeared which I nfess is remarkable, and many manufacturers produce it under the me of anastigmats or some such alliterative, contradictory term. ie lens, though, is better than the name, and once seen produces a sire which is only satiated by possession. The majority of these nses are composed of two series, each containing three lenses mented together, and each of these three lenses has a different fractive index; this I state on supposition and belief. One anufacturer makes a lens composed of two series of different foci, ch series composed of four lenses, and, though the glass is of such mposition that the lenses contain minute air bubbles, it appears practicable to grind out the air bubbles without producing striæ. seems that nature reverses itself, and that the eight lenses let in ore light than the six, and the six more than the four, although it ould appear natural that the simple achromatic containing the ast glass would let in more light than the rapid rectilinear. This, owever, is not so, and the new lens of eight combinations is xtremely rapid." With the lens Mr. Toch took a successful photo-raph at *f*·7 in one-twenty-fifth of a second late in the afternoon. Ir. Toch does not name the lens he used, but we presume, from his escription, that he refers to the Satz lens of Dr. Rudolph, in reference o which we humbly suggest he might have told us something more seful and informative than that he took a photograph with it in a ort space of time. However, we credit Mr. Toch with good ntentions.

How to make sure of Good Negatives.—Mr. C. shleigh Snow, in *Anthony*, narrates how, having need to make a rip for several hundred purely picturesque negatives, he took along a ng-focus lens of eighteen inches, a wide-angle lens, and his most alued companion, a hand camera for shutter work. He carried two agazines, holding nine plates each, slung by straps from either houlder, while his hand-camera plates were disposed in holders in the nner pockets of his canvas hunter's coat. He had a hatchet in his elt for making foregrounds, and a revolver in his hip pocket for armints, human or animal. *He was thus sure of bringing in two lozen carefully selected negatives each day.* The revolver, as an aid o making a certainty of obtaining good negatives, is an item of the hotographer's outfit that is fortunately not necessary in Great Britain.

A Silver-gold Printing-out Paper.—Mr. D. Bachrach, who condemns the use of emulsion printing-out papers on several grounds, but chiefly because he alleges that the toning action to which they are subjected is not thorough enough, refers approvingly, in the *Professional Photographer*, to a collodio-chloride of silver and gold paper, which has been patented as likely to yield permanent results. "The emulsion is made precisely the same, so far as I can see by the formula, as any other collodio-chloride emulsion, the only addition being about one grain of neutral chloride of gold to each ounce of emulsion. It would be worth while for experimenters to test this method thoroughly, for the baryta coating of the paper, which forms the base of the sensitised compound, is not liable to staining by the gold as paper is, nor is collodion such a difficult element to handle in connexion with gold as albumen. My experience leads me to believe that, if this gives good results in practice, the prints will be far more permanent than those now made, and it will probably give agreeable tones with thorough toning, which the present method does not. The regularity of tone and simplicity of operation would, it seems, become a necessary consequence."

An Astute Photographer.—The *Photo-American*, which, under new editorship, is rapidly increasing in interest, tells the following story *apropos* of the commonly accepted belief that photography cannot lie. "A certain street was full of black smoke from a factory every day to the great annoyance of the residents, who, tiring of the nuisance, hired a photographer to come and photograph the street, so that they would have evidence that they could produce in court if necessary. The genius who got the job took two negatives, scenting, perhaps, some *accident*. Of course, we are bound to suppose it *was* an accident, but what do you think, the negative he gave to those residents, with a print and a guarantee that it was in no way retouched, showed the street just choking with smoke and the houses almost indistinguishable, while the other one he developed a very long time, until the sky on the negative was as dense and black as the inside of a cherry-coloured cat. When a print was made from it, the houses showed the mortar in the bricks, and the sky was perfectly innocent of smoke or cloud. He sold that one to the factory."

An American Photographer's Union.—Such a Union has, according to the *Photo Beacon* (Chicago), been started in that town. Its objects are to check further reduction in prices, shorten hours of labour, and to inaugurate an effective apprentice system. While the carpenter and plumber work eight hours per day at a good salary, the photographer has, if he is an operator, to develop negatives after his day's work is done under the light; if a printer, to tone or mount prints after printing all day; if a retoucher, at the present prices, has to borrow the night to help him make a salary such as the other tradesmen can in eight hours. The union is in possession of a charter from the Federation of Labour, and is therefore a part of the whole organized labour movement and is backed by the same. It will have a delegate to the Chicago Federation in a short time, possibly after the next meeting of the Union. There are, in round numbers, 520,000 union men in Chicago who will patronise only union galleries, and look for the union stamp on photographs and eschew department stores.

FURTHER ON MATTERS COPYRIGHT.

The recent letters on this subject come at an opportune moment, as the use of copyright pictures by the illustrated journals and magazines has entered into a new and rather embarrassing stage, which is further complicated by the action of metropolitan photographers. Two cases have come under my notice this month alone; in one of them I was personally interested. I refer to the plan of employing copyright pictures, without any appearance of desiring to pirate, adopted by some magazines, who use, without authority, these pictures, but print under the reproductions the name of the photographer. There are honest, and there are dishonest, users. The honest users when remonstrated with say in effect, and probably with truth, "We pay for matter or pictures used every month, and even if you had not applied you would have received your cheque in due course for your picture copied by us." But let us see how this works out. In the first case, the dishonest people can say exactly the same thing; and who is to differentiate betwixt the two classes? Next, it will be perceived that, if the practice is to be permitted or condoned, the publisher arrogates to himself the power to fix the fee that is to be paid. As a matter of fact, two guineas is the maximum fee that most of the illustrated magazines profess to pay. The result would be that eventually a practice would grow up and become a "custom of trade" to such an extent that infringers would be able to plead custom if they were brought into court for damages or penalties, and the somewhat nebulous state that still characterises copyright law would become yet more uncertain, and actions against genuine pirates become less frequent in consequence. The ultimate effect would be, too, that the dishonest men would copy pictures in the unauthorised way I describe, and, when (as would only occasionally be the case with provincial photographers) their infringements were complained of, they would assume an air of injured innocence, and pay their guinea or two guineas, but leave every one unpaid who did not discover their *laches*.

I have been at some pains in putting this view before the editor of one magazine, who from personal acquaintance I know to behave honourably to photographers, and also to the manager of another of whom I have no personal knowledge, but who I am content to believe is honourable. He has said to me that he will not use any of my pictures for the future without consulting me. My wish is that all provincial photographers should object to the custom as I have done. If the managers of the Copyright Union take my view, it would be very desirable that they should issue a circular to this effect to all magazines and illustrated papers. Whether they will do so, however, is doubtful, for a few months ago, when I was in London, just about the time when the Union was

working (for or against my interests, as my readers may judge who read my remarks on the subject in these pages), I discussed the matter with a leading member of the Union, and one of the largest, if not the largest, of publishers of photographic subjects from the life in London. His reply astonished me. He said it was an understood thing that the papers, when they saw anything of his that they liked, published it without referring to him, and paid up at the end of the month. Whether this was a mere *façon de parler*, to cover the action of the Union in my case, it is impossible to say; but it was a very extraordinary statement to make, and the gentleman in question did not say whether the customary guinea or so was what he received, nor did he say what his action would be in case he estimated the value of his copyright by scores instead of units of pounds. It is this conversation I referred to in my preliminary remarks upon the way the new stage of the copyright question was embarrassed by the action of the metropolitan photographers.

It will be asked, "What remedy do I suggest?" I have already suggested one as a preventive measure, and I now describe to my brother photographers in the provinces another of a remedial nature. It has been justly observed by one correspondent that country photographers are little likely to come across any piracies of their pictures except by accident. But this now need not be, at any rate where the name is put under the picture. If any one care to send to Messrs. Romeike & Curtice, Press-cutting Agency, Strand, half-a-guinea, they will send him cuttings (to the extent, I believe, of sixty in number) from any of the papers or magazines wherein his name, or any name he chooses, appears. When he makes his application, he will be provided with a printed form to fill in, describing what he wants. He can word it, if he like, as follows: "My name only when accompanied by any illustration it is connected with;" or, if the picture or portrait is one unique and capable of ready description, "picture or portrait of ———." He will be fairly secure then of knowing when unauthorised, but named, use is made of his work. I know of several instances where Romeike's have been of considerable use and the original payment to them been repaid many times over.

I would now like to speak of one aspect of copyright matters on which I hold extremely strong views. I believe I am right in thinking that the view held by the chiefs of the Photographers' Copyright Union is, that the right to publish should be undoubtedly held by the owners of a copyright. The member who was mainly instrumental in the establishment of the Union informed me that such was his view, and at first sight it seems a natural and proper view to hold. But it will not bear examination. It it be persisted in, it will spell ruin to photographic interests in any future Copyright Act. When worked out, the principle amounts to this, a sitter, public or private character, professional or non-professional, when once he sits for a portrait without paying for it, has no further voice in the matter. No matter however poor the portrait may be in execution, no matter however imperfect or unflattering a representation it may be, he is bound to submit to its being scattered broadcast over the country. It may be said that no photographer who values his reputation would issue such a portrait, as it would be injurious to his reputation. I say that such a reply, be it true or untrue, is beside the question. No body of Englishmen or women would consent for one moment to put such power in the hands of a photographer, and a persistence in such demand would utterly wreck the photographer's chances. I do not think we are ever likely to be subjected on our part to any unjust withholding of consent to publication on the part of non-paying sitters, but in any case we must take our chance. I appeal to all who agree with me to let it be emphatically known that their view is that no portrait should be published, copyright or not, without the consent of the person photographed. The point is one of the gravest importance. I hope to see in these pages the names of many esteemed friends, and of others unknown to me personally, who uphold this, the only way in which honourable men can look upon the publication of portraits.

G. Watmough Webster, F.C.S., F.R.P.S.

THE USE OF VARIOUS IRON SALTS IN THE BLUE PRINTING PROCESS.

[Translated from the Photographische Correspondenz.]

The preparation of a good paper for the blue process does not, at the present time, offer any difficulty to the practical man. It is very simple, and rests principally upon the sensitiveness to light of certain ferric salts, amongst which the brown ammonio-citrate of iron is in the first rank. As ordinarily used for photographic purposes, this salt is in the form of bright, very hygroscopic, brown-coloured flakes. These are not crystals, but their formation is due to the evaporation of a concentrated solution of the salt, upon smooth glass or porcelain dishes, in thin layers. A copying paper that will yield a blue positive from a line negative, or a white-lined print upon blue ground, from a drawing upon tracing paper, may be prepared by brushing over, and then rapidly drying, a suitable paper with ammonio-citrate of iron dissolved in water (10 parts in 40 to 50 of water), to which has been added a rather concentrated solution of yellow prussiate of potash (8 parts in 40 to 50 of water). This solution must be preserved from light.

Paper prepared in this manner remains unchanged for some time if kept from light and moisture, but its sensitiveness leaves much to be desired. For comparison, we shall hereafter refer to it as normal paper. Ordinary albumenised paper is four to five times more sensitive than the above cyanotype paper, according to tests made with a paper scale photometer, the capacity for light absorption of which had been carefully determined previously per sheet.

Many attempts have been made to render cyanotype paper more sensitive to light, and in this respect I would refer to the work of A. Fisch,* Schnauss,† Carey Lea,‡ La Grange,§ and others. It was recommended to use the tartrate salt (A. Fisch), or the oxalate salt, instead of ammonio-citrate of iron. In both cases the sensitiveness to light is increased, but the keeping quality is lowered.

A number of experiments were made by me also to increase the sensitiveness without detriment to the keeping quality, and I arrived at the following results:—Additions to the normal cyanotype preparations of a twenty per cent. solution of ferric oxalate, as used in platinotype, raised the sensitiveness considerably. Large additions rendered the paper bluish after drying, and the greatest permissible addition of ferric oxalate is 1 c. c. to 20 c. c. of cyanotype solution, but even with this the paper turns greenish-blue in drying.

For practical purposes the highest addition that can be recommended is 1 to 2 c. c. per 80 to 100 c. c. of sensitising solution. 1. The increase of sensitiveness in this case is still three to four fold, whilst with an addition of 1 c. c. to 20 c. c. the exposure is reduced to one-sixth, but the whites are no longer pure. The keeping of the paper is not much affected by this addition.

2. Additions of double salts of iron (potassium ferric oxalate, sodium ferric oxalate, and ammonium ferric oxalate).

The sensitiveness of paper prepared with aqueous solutions of equivalent quantities of these salts, to which the same quantity of potassium ferricyanide had been added, was in the ratio of 8 : 11 : 20, the last figure being due to ammonium ferricyanide. Additions of this latter salt to the normal cyanotype solution favourably increased the sensitiveness of the prepared paper, and affected its keeping qualities in a smal degree only.

The double salts formed by ferric citrate with ammonium citrate have been investigated by Rother, who describes as neutral ammonio-citrate of iron the green salt corresponding to the formula $FeC_6H_5O_7.(NH_4)_3C_6H_5O_7$. This is in small green scales, and in aqueous solution the colour is yellowish green.

Rother also describes two acid salts composed as follows: $FeC_6H_5O_7.(NH_4)_2C_6H_6O_7$ and $FeC_6H_5O_7.(NH_4)C_6H_7O_7$. These salts also form green scales, and, like the neutral salts, are of a green colour in aqueous solution. Solutions of these salts turn brown upon the addition of ammonia, and return more slowly to green upon addition of citric acid.

The brown ferric citrate generally used by photographers in the cyanotype process, described at the commencement of this paper, does not correspond with any of these salts as to the proportion of iron, but I have also found that the green salt of commerce, as sent out, for instance, by J. Merk of Darmstadt, differs from the above formulæ also.

Comparative experiments, for the purpose of studying the action of the brown and green salts of commerce in relation to cyanotype, gave results very favourable to the use of the green salt. I therefore endeavoured to ascertain by analysis the composition of both the salts I had used in my experiments. Both preparations were of German manufacture. The brown salt consisted of very hygroscopic, bright dark-brown reddish flakes, which remained unchanged when heated to 140°C, whilst the green salt gave a strong acid reaction and changed colour at 140°C. Upon addition of ammonia the solution of the brown salt became a deep red-brown colour, and the yellowish-green solution of the green salt was also changed to brown by the addition of ammonia.

The salts, dried at at a temperature of 100° C., were subjected to elementary analysis, and the amount of carbon and hydrogen ascertained. The amount of iron was determined by calcining the salt in a platinum crucible, fusing the residue with acid potassium sulphate, and

* *La Photoscopie*, 1836, p. 28. † *Photographisches Archiv*, 1863.
‡ *Seely's American Journal*, 1834. § *Photographisches Wochenblatt*, 1887.

titrating the iron in the reduced solution of the fusion with a solution of hypermanganate of potash. This was checked by weighing the ferric oxide left in the boat from the elementary analysis.

Brown Salt.	Found.	Calculated from the formula given below.
C	24·64 per cent.	24·82 per cent.
H	3·94 ,,	3·94 ,,
N, calculated from the ammonia found	6·08 ,,	6·20 ,,
Fe	19·54 ,,	19·32 ,,
O, calculated from the difference	45·80 ,,	45·72 ,,
Total	100·00 ,,	100·00 ,,

The composition, according to the results of this analysis, is best expressed by the formula—

$$4FeC_6H_5O_7,\ 3(NH_4)_3C_6H_5O_7,\ 3Fe(OH)_3.$$

The brown salt is, therefore, a basic double salt, whose composition is probably subject to small variations according to the method of preparation.

Green Salt.

	Found.	Calculated from the formula given below.
Carbon	29·45 per cent.	29·45 per cent.
Hydrogen	3·88 ,,	3 78 ,,
Nitrogen (calculated from the ammonia found)	5·— ,,	5 01 ,,
Iron	14·47 ,,	14·31 ,,
Oxygen (calculated from the difference)	47·20 ,,	47·45 ,,
Total	100·00 ,,	100·00 ,,

The ascertained composition corresponds approximately to the formula :—

$$5FeC_6H_5O_7.2(NH_4)_3C_6H_5O_7.1(NH)_4C_6H_7O_7 + 2H_2O.$$

The preparation examined seems, therefore, to be a mixture of neutral ammonio-citrate of iron $FeC_6H_5O_7(NH_4)_3C_6H_5O_7$, acid ammonio-citrate of iron, $FeC_6H_5O_7.NH_4C_6H_7O_7$ and ferric citrate $FeC_6H_5O_7$.

The composition of this salt, as well as of the brown ammonio-citrate of iron, as found in commerce, therefore by no means agrees with that of the pure salt. But the composition of the commercial article should be subject to certain variations according to the method of preparation, which seems to have some explanation in the circumstance that both salts do not crystallise, and the statement of a manufacturer that the composition of the salt sold by him "has been selected according to the experience of many years and by reason of communications from customers."

Taking into consideration the amount of oxalate of iron contained in both salts according to the formulæ given above, it would appear that the directions for the preparation of cyanotype paper with the brown salt should be modified in using the green, and, instead of 10 parts of the brown salt, about 7·7 parts of the green should be substituted. On the other hand, by calculation of the equivalent quantities of iron, 10 parts of the brown correspond to 13·5 parts of the green salt, per 100 parts of water and 8 parts of ferricyanide of potash.

In either case the use of the green salt increases the sensitiveness considerably, judged by reduction of the exposure ; but in both cases the green salt gives a blue veil, and the image is not distinct. This ault is easily removed by reducing the amount of ferricyanide of potash in the preparing solution.

The following solution proved the best :—

Solution A.

Green ammonio-citrate of iron	12·5 grammes
Water	50 c. c.

Solution B.

Ferricyanide of potash	4·5 grammes.
Water	50 c. c.

By mixing the solutions and brushing the same upon rough paper, a cyanotype paper of very good quality is obtained.

Experiments with the photometer showed that its sensitiveness was eight times greater than that of cyanotype paper prepared with the brown salt, as described in the introduction.

With reference to keeping quality, the preparing solution in the mixed state, kept in opaque glass vessels, is more stable than that made with the brown salt, and the prepared paper, as far as my observations extend, appears to remain equally good.

The experiments in this last respect require a longer period of observation and are not yet concluded. At a future date I will give information of the results. In any case the advantages of high sensitiveness of the paper (consequent upon shorter printing), and great vigour and brilliancy of the prints, are such that the green salt will be preferred to the brown in the preparation of cyanotype papers.

E. Valenta.

FIXING WITH SULPHOCYANIDES.

To a great many minds the chief objection to silver printing in any form is the apparent necessity for the use of the hypo fixing bath and many have been the efforts made from the earliest times to dispense with this "treacherous" compound, or replace it by some other which, while efficient as a fixing agent, shall be free from the faults of hypo.

As a mere fixing agent for chloride of silver prints, there can be no doubt that sodium thiosulphate stands far ahead of all rivals by reason of its high solvent action on the haloid salt and its absence, practically, of all reducing effect on the image. Cyanide of potassium, it is true, possesses also the former property in at least as high a degree, but it is quite unsuited to the purpose of fixing positives on account of its energetic action on the image itself. Of the other substances capable of use as fixing agents, the principal are chloride of sodium, sulphite of sodium, ammonia and the alkaline sulphocyanides, but the first three of these, although they have been tried, may be dismissed on account of their low solvent power.

Chloride of sodium was actually used before the advent of hypo, but was quickly replaced by the latter, although, in later years, an attempt was made by the late Dr. Liesegang to revive its use in connexion with collodio-chloride paper. In comparatively recent years, too, Captain Abney recommended sulphite of sodium as a substitute for hypo, and, although the chemical composition of the two salts does not differ much, the reactions that occur in fixing are sufficiently distinct to render the change desirable if practicable. But neither of these agents can possibly compete with hypo in fixing power, as a glance at the table of *Solubilities of the Silver Haloids* in our Almanac will show. Ammonia, although a powerful solvent of chloride of silver, is placed entirely out of court, no less by the inconvenience attending its use than by its solvent action on albumen, gelatine, and similar surfaces, while, as already pointed out, cyanide of potassium is disqualified by its action upon the image.

If the objection to the use of chloride or sulphite of sodium were confined to the lower degree of solubility, it is possible that the other advantages they possess would rule in their favour ; but, if we remember how numerous are the complaints of imperfect fixation heard even when hypo is the agent used, the prospect cannot be said to be hopeful that the far weaker solvents would prove a practical success, while their greater cost, or at least that of the sulphite, would actually lead to a dangerous economy in its use.

The only likely agents remaining are the alkaline sulphocyanides, of which the ammonium salt, which appears to be the most energetic, may be taken as the type. These were proposed as substitutes for hypo more than thirty years ago by M. Menier, and, owing to their comparatively high solvent powers, were eagerly taken up by experimentalists. By reference to Valenta's table in the Almanac, taking a fifteen per cent. solution of hypo as the standard, which is equivalent to three ounces to the pint, we find that the solvent power of sulphocyanide of ammonium of the same strength is just about one-half, while sodium sulphite would be by calculation less than one quarter ; but, at greater strength, the power of sulphocyanide increases in rapid proportion, while that of hypo rather wanes, so that it is possible to use a solution of sulphocyanide which is, to all intents and purposes, as powerful a solvent as sodium hyposulphite. But on this point we shall have more to say presently.

It soon became apparent that all was not as it should be in connexion with fixation by means of sulphocyanide, for the prints were found to change under the action of light, however carefully they might be treated in the matter of fixing and washing. The deterioration, let it be remarked, was not one of mere discolouration from decomposition within the print itself, as in the case of ordinary "fading," but the paper remained sensitive to light after fixing, which was, of course, fatal to the reputation of sulphocyanide. Mr. John Spiller stated at the time that, although sulphocyanide of ammonium was a perfect solvent of chloride of silver, it exercised but an imperfect action upon the albumenate of silver, also present in large proportions in the albumenised paper then universally employed, and he attributed the imperfect action to the fact that a portion of the albumenate of silver was left in the print, and, of course, rendered it liable to change.

This may possibly, or probably, have been the case, but at the best it was only a partial explanation of the cause of failure, as we believe the main, if not the true and only, solution of the problem is to be found in another direction altogether. It was pointed out in these columns some months ago that sulphocyanide of ammonium was preferable to either hypo or cyanide of potassium for fixing bromide films that were required to undergo subsequent intensification, but that it was necessary to adopt a system of double fixing owing to a partial reprecipitation of the silver bromide on washing the plate. It is to the fact, that in the concentrated condition sulphocyanide of ammonium will dissolve proportionately more of the silver haloids than in a more dilute state, it proved a failure as a fixing agent.

In this respect it is interesting to compare it with hypo. If we refer again to Valenta's table, we find that the percentages of chloride of silver dissolved by solutions of hypo of five, ten, and fifteen per cent. are given as 2·00, 4·10, and 5·50 respectively, while the figures for sulphocyanide of ammonium in solutions of the same strengths are 0·08, 0·54, 2·88. Now, what first strikes the eye is the great disparity between the weaker solutions, which, in the case of sulphocyanide, would seem to be quite useless for fixing purposes; but this is not the point we wish to emphasise. Let us take a fifteen per cent. solution of hypo containing 5·5 per cent. of dissolved chloride of silver, and dilute it with two volumes of water to reduce it to the condition of a five per cent. solution. By calculation, we find that each 100 parts of solution will contain 1·53 of dissolved chloride of silver, while a glance at the table shows that it is capable of dissolving two per cent. Similarly treating a fifteen per cent. solution of sulphocyanide of ammonium, we have 2·88 of AgCl in solution, and, after dilution with two volumes of water, there will be for each 100 parts of five per cent. solution 0·96 of silver chloride; but the table shows us that the five per cent. solution is only capable of dissolving 0·08 of the chloride, and that consequently 0·88, or eleven-twelfths of the whole of the silver in solution, will be thrown down. It is a very easy experiment to try, but one that will prove very convincing.

We have been experimenting with sulphocyanide for several months past, and, as a matter of fact, find that it can be used as a fixing agent with perfect safety if the above points be kept in view. We do not intend here to discuss the probable permanency of the results, except so far as concerns the complete removal of the sensitive salts from the prints. It must always be borne in mind that the sulphocyanides, like hypo, are sulphur compounds, which alone would suffice to condemn them in the eyes of a genuine "sulphophobe," but with that phase of the question we have nothing now to do. What we can vouch for is that prints on albumen and collodio-chloride paper (for gelatino-chloride the treatment is not suited), fixed with sulphocyanide seven or eight months ago, and constantly exposed to light and atmosphere, are as good as when freshly made, and cleaner in the whites than similar ones fixed with hypo at the same time for comparison.

The *modus operandi* is extremely simple. The prints are fixed in the usual way in a fifteen per cent. solution of sulphocyanide for ten minutes or a quarter of an hour, and are then soaked in a dish of water for three minutes, after which they are rinsed through one or two changes of fresh water, and then placed for another five minutes in *fresh* sulphocyanide. The small quantity of silver redeposited in the print from the solution contained in its pores is so small that, on the second fixing, no precipitation occurs, and the prints appear to be as completely fixed as if hypo were used; and this is equally true of albumen and collodion prints, so that we are not disposed to attribute former failures to albumenate of silver.

Of course, this is a more troublesome, as well as a more expensive, method of fixing than with hypo, but it seems to be undoubtedly cleaner, and will, no doubt, find favour with those purists who place quality and permanence of result before anything else.

THE PRODUCTION OF COLOUR BY PHOTOGRAPHIC METHODS.

[Abstract of paper read before the Society of Arts.]

We now come to what is, I think, the latest development of colour photography—the very interesting process of M. Villedieu Chassagne, a process which a fortunate accident some time ago brought to my notice, and one which is, I think, of sufficient importance to justify its being brought before the Society even in its present stage.

The actual inventor of the process, I am told, was Dr. Adrien Michel Daneac, and it was worked out jointly by him and by M. Chassagne; but the illness of the former incapacitated him from pursuing his researches, and the matter was left in M. Chassagne's hands alone.

The process, so far as we know it, is as follows: A negative is taken on an ordinary gelatine plate, which has been prepared by treatment with a solution, the ingredients of which are unknown. The negative thus obtained shows no trace of colour, and appears in all respects like any other photographic negative. From it a print is taken on ordinary albumenised silver paper, which has been treated with the before-mentioned solution; or, if a transparency is desired, on a gelatine plate prepared in the same manner as that which was used for the negative. This print shows no trace of colour, either by reflected or transmitted light. The print, when dry, is washed over with the solution, and is afterwards treated successively with three coloured solutions—blue, green, and red—the operation being conducted in a bright light. As the solutions are applied, the print gradually takes up its appropriate colours, the intermediate tints being, it is supposed, produced by a mixture or combination of the three primaries. That a yellow colour should be produced by a combination of what are presumably green and red pigments is not in accordance with expectation, for, though red light and green light, when superimposed, produce yellow, we do not get yellow by mixing red and green colouring matters. Probably the yellow is produced by the application of a yellow dye mixed in the green solution, and not by a combination of colours.

I have myself seen the colours applied in the way I have described, and the promised results produced. Mr. Herbert Jackson and myself took negatives on M. Chassagne's plates of various test objects. Mr. Jackson was afterwards kind enough to make some positives from these plates, and neither negative nor positive was touched, or I think seen, by M. Chassagne, until we placed them in his hands, that they might receive their final treatment. On the application of the colouring solutions, we saw that the proper colours were produced.

Photographically, the results we obtained were very poor; the prints were extremely thin and unsatisfactory, as was not to be wondered at, since the negatives were taken on a dull, foggy day. Nevertheless, they showed a great deal more than traces of the proper colours. A blue china vase, with a piece of red ribbon tied round it, and containing a bunch of flowers, was reproduced with perfect accuracy, though the image was thin and faint. An Indian brass pot showed not only the yellow colour of the brass, but also distinctly metallic lustre. Altogether I can only say that the result of these experiments, so far as they went, satisfied myself, and I think the others who saw them, that the results were produced in the manner described. Were it not for the novelty of the process and the difficulty of accounting for its results, it would be accepted without hesitation. Whatever hesitation exists is, after all, but a testimony to its importance.

In a secret processs such as this it does not seem worth while to speculate. First, because it is waste of time guessing how results are produced that we may expect to have fully described to us in a short time; and, secondly, because it does not seem fair to use information published by an inventor for the purpose of finding out the nature of his invention and robbing him of the reward of his work.

I should like, however, to draw your attention to some more or less recent researches which indicate what has been done by workers in the same field, since they may help us to realise what probability there is of success being attained by this or some similar process.

All, I think, are based on the process of Becquerel, to which I referred in an earlier part of this paper. Now, very much depends on the manner in which the colour of the Becquerel film is produced; whether they are pigmentary or interference colours. If the latter is the case, the only hope for success is on the track which has been so successfully followed by M. Lippmann. If the former, there may be some hope, by chemical treatment, of so developing or reinforcing the colours as to produce results such as those we have seen this evening.

In an elaborate paper by Otto Wiener, to which my friend, Mr. Bolas, has drawn my attention, a method is suggested for distinguishing between interference colours and actual pigmentary colours, depending on the fact that interference colours change with the angle of view, while pigmentary colours do not. When tested by this method, it was found that colours obtained by Becquerel's method on chlorised silver plates were due in the main to interference, but that, when chloride of silver in a flocculent mass was used, the colouration was pigmentary in its nature, and the same colour was observed by reflected or transmitted light.

Up to the present no explanation has been offered why any coloured compound should correspond to the rays which produce it. But Wiener somewhat boldly hazards the theory that there is a potentiality of producing various coloured bodies in the action of light. He suggests that any given colour tends to survive under a radiation corresponding to itself, because it best reflects that radiation, absorbing it least, and being therefore least affected by it. In fact, he lays it down as a probable general law that coloured illumination acting on suitable material generates pigmentary bodies of corresponding colours. The theory is interesting, and would answer many questions if it could be substantiated, but at present I know of no evidence by which it can be supported.

The chemical treatment of the Becquerel film has been attempted by very many. Success has been frequently announced but very rarely attained. The most recent publication on the subject is contained in a paper brought by Mons. A. Graby before the Paris Academy of Sciences,

an abstract of which, translated from the *Comptes Rendus*, appeared in the *Photogram* for the current month. An exposure is made on the surface of silver chloride in contact with various reagents. So far as can be gathered from the abstract, it appears to be assumed that red, blue, and yellow subchlorides of silver exist in the film, or are produced in it by the preliminary exposure which is made before the exposure to the coloured image. The author appears to argue that the coloured chlorides are preserved in light of their own colour, and are destroyed, or converted, by light of another colour acting on them in the presence of the reagents specified. That chloride of silver can be obtained in a condition showing strong colours we know from the researches of Cary Lea in 1887, researches which attracted a great deal of attention at the time, but have not borne much fruit since.

In the year mentioned, he announced that the haloid salts of silver (chloride, bromide, and iodide) could be obtained, by chemical treatment, of various colours — red, purple, and blue. Whether these "photo-salts," as Carey Lea termed them, are definite chemical compounds, or whether they are not of the nature of "lakes" (organic colouring matters precipitated in the presence of a metallic base, generally alumina), "physical combinations of unaltered haloid with the reduction product" (Meldola) is, I believe, still an unsettled question. If these photo-salts are of this character, and if they have the power of combining with colouring matters of their own hue, and if again a process for practically utilising these properties can be worked out, it is conceivable that pictures such as Becquerel produced might, if I may be allowed the expression, be so reinforced by the addition of colouring matters as to be turned into permanent coloured pictures. This, indeed, is mere speculation, and rather crude speculation, for it assumes a very great deal more than we have any right to assume.

Sir Henry Trueman Wood.

THE GENTLE ART OF PHOTOGRAPHIC CONTROVERSY.

In the Neolithic age, we are told, the constructor of tribal lays left *his* views on Art, "barbed and tanged," below the heart of an etcher that disagreed with him; and we have also read of the sudden and untimely dissolution, in comparatively quite recent times, of a certain scientific society by reason of the vigour and precision with which its members hurled at each other various items of the Society's collection of fossils during a little discussion upon a question of fossiliferous identification. But such forcible and reprehensible proceedings are impossible to-day in our highly refined civilisation; and more especially so in the calm and serene atmosphere in which photographers live, and move, and have their debates. The only missiles allowed are the "winged words" that drop from the lips, or flow from the pens, of cool, unimpassioned photographers, whose open minds are ever ready to receive and consider the views of their candid and courteous opponents; and no heavier or more harmful weapon is in use than the column of small type in which their weighty wisdom appears in their favourite photographic paper. Nevertheless, it is much to be regretted, in the interests of the aspiring amateur anxious to excel in every branch of his favoured hobby that, notwithstanding the fact that controversies loom so large and frequent in the photographic world as to afford a broad base of fact upon which to induce laws for their conduct, no effort has yet been made to do so. So far as our information extends, not one of the almost innumerable text-books devotes even a chapter to this fascinating subject; the editors of photographic papers consider it not in their leading articles, and their contributors, regular as well as occasional, regard it as unworthy an essay from the pen of any one. The present writer cannot lay claim to such a knowledge of the subject as would justify his posing as an oracular judge, nor to such an intimate acquaintance as would make his own experiences worth recounting; he can only hope that the few thoughts he puts forward from his advantageous position of looker-on—who in this, as in so many other matters, sees most of the game—may suggest to some master of the art the desirability of giving to an expectant world the results of his own arduous labours and profound study.

Analysis shows that sufficient analogy exists between the conduct of a controversy and the making of a photograph as to allow of the description of the one conforming generally to the ordinary and more prosaic processes of the other. Choice of subject is naturally the first consideration; and the choice is difficult only from the abundance of both men and matter. Putting aside the still unsettled question as to whom credit is due for the invention or discovery of photography, ever since it became an existent fact there has raged, and still rages, the fiercest of fights between conflicting forces, who contend, the one that it is an art, and the other that it is a science. This can always be relied upon to furnish a suitable subject without unreasonable trouble or delay, more especially as of late years there has appeared upon the field of battle a third party, who assert that it is neither art nor science, but a handicraft. At the same time it is only right that the budding controversialist should be warned that, like certain classes of views which used to be seen at Exhibitions, this subject has been used so often that exceptional ability is necessary now to secure its admittance to the arena; and he is therefore confidently advised to choose some particular detail, and fight for the general principle upon that—a course of procedure generally successful. Photographers of scientific tendencies and taste have an almost unlimited field of operations in the attack and defence of generally recognised theories, or by the putting forward of brand-new startling theories of their own. The Banksian theory of development recently afforded an admirable example of this latter kind; although we do not remember that this controversy was pushed, as it might have been, so far as to consider whether the prior researches of Dr. Burton-Coxe upon the same subject were responsible for its appearance. Finally, there is always close at hand the perennial subjects of the management of the Royal Photographic Society and the Camera Club respectively—whether the proceedings of "young bloods of Pall Mall," or the words and works of the members of the "Linked Ring" are more calculated to benefit photography is a question that, in all its bearings and details, should, and does, furnish inexhaustible supplies of the richest controversial material.

The subject having been decided, the next step is the exposure. This may be made either by a paper read before a photographic society and reported in due course, or by an article specially written for the purpose and published in the press. It is really immaterial which method is adopted, for the ultimate result in either case is the same. In controversy, however, the sensitive medium is not a plate but a person, who, lying quiescent until roused by the light concentrated upon him by the lens of the challenging controversialist, suddenly awakes to life his latent properties and powers of reply. So far as we can trace the process, the granulated grey matter of his sensitiveness is thereby much agitated and disturbed; it is thrown into a state of violent ebullition, it fumes and effervesces in the form of gas; and, if the exposure has been duly directed and discreetly managed, in due course the image appears in the guise of a furious reply. Then the operator knows he has been successful in commencing a controversy; he has brought into existence a positive and negative of most pronounced antagonistic repulsion.

Development proceeds apace: friends and followers of the combatants fly to their assistance on either side, and the fight rages furiously, extending far and wide. Accusation is repelled by counter-accusation, assertion is met by assertion, and argument by argument or vituperation as the case may require or the parties prefer. A mist as of cannon smoke is thrown over the field of battle by the vagueness and fuzzyness of the image; and a fog marches behind those well-meaning combatants, who hasten to the fray with the "true meaning," or the "spirit," or the "nature" of the matter as their weapons. It may be here remarked that in controversy the image should never be as a photograph in which every detail is sharp and distinct and indubitable; a certain indistinctness, as of a picture produced with the lens out of focus; an atmosphere of suggestion, scope for unfettered imagination and capricious fancy, with unlimited licence in the constructions that can be placed upon its possible meanings, are all essentials of the highest success. Given all or most of these, the controversy should proceed to develop in a perfectly satisfactory manner; but should it be, for any cause, slow in appearing or languish afterwards, intensification becomes necessary. This is best administered in minute doses, highly concentrated, the usual form being that of editorial note or comment, although the superfine variety is often cloaked in a pseudonym so thin as to cover, but not conceal, the body within.

A last word may be said as to the use of "personalities." Assertion, argument, deduction, and inference may be taken as corresponding with the pyro, hypo, and other chemicals used in the various photographic processes; and "personalities to x amount" as the equivalent for "water to y ounces" in the other kind of formulæ. It is in the use of personalities that the master of the art shows his immense superiority over the mere beginner. The quantity necessary or desirable can only be gauged exactly after long experience and careful study; it varies so greatly, according to the controversy in progress and the sensitiveness and position of the person whose pugnacity has been provoked. Properly applied, personalities may be relied upon to give brilliant effects, both in the high lights and the deep shadows, and to add a picturesque profusion of detail, enjoyable and soul-satisfying, to what otherwise would be merely a bald and uninteresting ordinary controversy. E. R. Jameson.

PHOTOGRAPHING BEAUTY.*

In the issue of the *Minster* for February, 1896, there are given some "Ideal Types of Beauty by Twenty Black-and-White Artists," and it is indeed curious to see the peculiar ideas some of them have. I take it for granted that the specimens given are English girls; it would be unfair in such a competition to go further afield, as not only do opinions differ among our own countrymen, but also in various countries. A fair complexion, for instance, is a shocking deformity on the coast of Guinea; thick lips and a short nose are there admired. In some nations long ears that hang down upon the shoulders are the objects of universal admiration. In China, if a lady's foot is so large as to be fit to walk on, she is regarded as a monster of ugliness. Some of the savages of North America tie four boards round the heads of their children, and thus squeeze them, while their bones are tender and gristly, into a form that is perfectly square. Englishmen are astonished at the absurd barbarity

* Concluded from page 120.

of this practice and try their best to prevent it, they do not reflect for one single moment that the ladies of England are daily ruining their health by squeezing other parts of the human form to an unnatural degree; but stay, I am wandering from my subject.

Are beautiful women decreasing in numbers? I have often heard the question argued, but no satisfactory answer has yet been given. In olden times there were (if we may believe all we read) certainly some sensational beauties in the land, or perhaps it was they were so scarce that their presence was a novel attraction for the masses.

Maria and Elizabeth Gunning, who appeared at the Court of George II.—one at the age of eighteen and the other nineteen—were two portionless girls of surpassing loveliness. "They are declared," writes Walpole, "to be the handsomest women alive; they can't walk in the park or go to Vauxhall but such crowds follow them that they are generally driven away." One day they went to see Hampton Court. As they were going into the Beauty Room, another company arrived. The housekeeper said, "This way, ladies; here are the beauties."

A French writer's opinion of English maidens of to-day is interesting. "Among lovely things," says he, "there are few so lovely in the world; well shaped, strong, sure of themselves, so thoroughly sound and open, so exempted from coquetting. Impossible, unless one has seen it, to imagine this freshness, this innocence. Many of them are flowers—flowers just bursting into bloom; only the morning rose, with its pure and delightful tints, with its petals studded with dew-drops, can give an idea of it; far in advance this of the beauty of the south, with its distinct, finished, fixed outlines, constituting a definite design; here all reminds us of the fragility, delicacy, and continual flow of life; eyes full of candour, blue as violets, looking without consciousness of what they are looking at; at the slightest emotion the blood diffusing itself over the cheeks, the neck, even down to the shoulders, in purple-tinted waves; you see emotions flitting on these transparent flashes, like the varying tints that play upon their meadows; and this virgin purity is so genuine, that you feel an impulse to lower your eyes in respect." This description is very refreshing, more especially as it comes direct from the gay city whence all beauty is supposed to emanate.

Another French author (M. Thévenin), speaking of Parisian girls, declares that he would rather turn fakir and pass his whole life in contemplation than espouse one of those empty, stupid, proud, and pretentious women, who believe themselves musicians because they can get through a polka, distinguished because they are draped with cashmere, and well-born because they do not know the price of butter.

French girls consider it a point of extreme ugliness to be stout. They give more attention to the figure, hands and feet, even than to their complexion. American women consider complexion before features. They admire the pink and white of a perfect skin, even with irregular features, far more than a face of artistic accuracy, if the complexion be faulty. Our English girls give attention to all points, wishing to be perfect in everything pertaining to beauty. That they achieve success is evident, or why is it so universally declared that British maidens are the most beautiful and accomplished of any?

Where can a photographer find beauty? Many, in answer to this question, reply at once, "On the stage." Oh, for the arts of the toilet! for stage costume and the illusion of the foot-lights! what a sad mistake. I do not wish to imply that there are *no* pretty girls on the stage, but that they are not so plentiful as they appear to be when viewed from before the footlights. For upwards of twelve months I occupied an office facing the stage door of one of our principal provincial theatres, and, needless to say, I was ever on the look out for material for my camera; but, from all the companies that visited the place, I found not one girl—no, not even one—that equalled the model alluded to earlier in this paper—one working in a close-cribbed factory for the paltry sum of six shillings per week

One actress confessed to me that all her admirers were disenchanted when they beheld her off the stage for the first time, and in ordinary dress. Minus wigs and make-up, even beautiful women lose part of their brilliancy; and one gentleman who had fallen in love with a "principal boy" would not believe that his charmer, when deprived of her beautiful stage dress and youthful make-up, was the same woman, but departed hurriedly, to her no small amusement. Some men are unable to grasp the fact that it is possible to alter the facial features, and so transform the appearance as to be able to deceive any one.

A short time ago I was introduced to one of our leading London actors, who soon learned my "little weakness" and promised to introduce me to which of the leading beauties I should choose. What an opportunity! I chose one of those charming damsels whose pictures hang in most windows, and, next day we set off upon our mission. We went to a restaurant where, he said, she always lunched. We sat for about an hour, and I watched every arrival with feverish excitement, but, alas! she did not seem to come. I got tired of waiting, and told my friend so. "Why," said he, "haven't you seen enough of her? It was she and —— —— (another recognised beauty) who sat opposite you for more than half an hour." He meant to teach me a lesson, and he did so. I saw her again on the morrow and conversed with her, but bade her adieu with the thought that "it was beauty's privilege to kill Time, and, in revenge, Time killed beauty."

"Photographic" beauty, then, as insinuated above, is to be found in hidden places. Out in the broad fields, in old farmsteads, and even in offices and factories, we find genuine beauty—beauty uncontaminated with paint or powder and without wigs—beauty, of which Byron says,—

> "We gaze and turn away and know not why,
> Dazzled and drunk with beauty, till the heart
> Reels with its fulness."

Rustic beauty has, generally, one great advantage over that of the town, it is devoid of conceit. Conceit is to nature what paint is to real beauty, it is not only needless, but it impairs what it would improve. Shakespeare truly says:—

> "As flowers dead lie wither'd on the ground;
> As broken glass no cement can redress;
> So beauty, blemish'd once, for ever's lost,
> In spite of physic, painting, pain, and cost."

Many people cannot, unfortunately, talk of this subject without attempting to make it an *affaire du cœur;* to such I would repeat Addison's lines:—

> "Beauty soon grows familiar to the lover,
> Fades in his eye, and palls upon the sense."

A man who cannot follow up this particular branch without the thoughts of an *affaire d'amour* had better let it severely alone, and leave it to men who can.

Authorities do not differ very widely in their opinions upon the beauty of the human form. The consensus of opinion seems to be as follows:—The palm of beauty and symmetry of figure, combined with elegant carriage, is given to the girls of sunny Spain, while those from the land of the shamrock are a good second, especially when the hands are taken into consideration. The hands of the English girls are too plump, German girls' hands too broad and fat, while the Spanish feminine hand is the least graceful of all. Ladies of the Turkish harem also possess hands of an exquisite shape. The prettiest faces and the most graceful throats are found among English maidens. The brightest complexions and the best eyes are possessed by the Irish lassies, while an American would be claimed for the finger nails, and a Hindostanee for the feet. A perfect arm is to be found only among Grecian women, the latter women also claim the best-shaped heads. In spite of all these, there are some who claim that it is not the most perfect beauty which in public would attract the greatest observation, nor even that which the statuary would admit to be a faultless piece of clay, kneaded up with blood. But that is true beauty which has not only a substance but a spirit—a beauty that we must intimately know justly to appreciate.

> "Hard is the task, and bold the advent'rous flight
> Of him who dares in praise of beauty write,
> For, when to that high theme our thoughts ascend,
> 'Tis to detract too poorly to commend."

RICHARD PENLAKE.

THE WEST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

A PRIVATE view of the Annual Exhibition of photographs by members of the West London Photographic Society was held at the Broadway Hall, Hammersmith, on the evening of Friday, the 19th inst., and the Exhibition was open to the public free on the following day.

The Exhibition was restricted to the work of members of the Society, and all the pictures sent in were hung, so that a fair opportunity was given of forming an opinion as to the usefulness of the Society in educating its members in the applications of photography, pictorially and technically. We were pleased to find that the Society maintains its reputation, and not only were there many pictures which would grace the walls of any exhibition, but the proportion of those which it would have been better to have been left unhung was singularly small, and, even in these cases, the worst that could be said against them was they were commonplace photographs.

The Judges appointed were Messrs. F. P. Cembrano, jun., F.R.P.S., and W. L. Colls, F.R.P.S., but the former gentleman was unable to act. The Exhibition was held under the rules framed by the Committee of Judges, and there were therefore no classes, but one silver medal and bronze medals at discretion were placed at the disposal of the Judges. The silver medal was awarded to Mr. Leslie Selby for *The Pathway*, a snow scene, somewhat reminiscent of a well-known and much-medalled picture on the same theme. Mr. Selby's exhibit was a numerous one, but there was not in it one picture that we could have wished away. The influence of his style showed itself very clearly in the works of several others of the members; but it is a good influence, on the whole, and can only do harm to those who unintelligently endeavour to imitate the mannerisms of their master rather than to understand the sentiment of his work. The President of the Society, Mr. George Lamley, is awarded two bronze medals. His successful pictures are *In Dublin Bay*, which will be familiar to those who visited the last Pall Mall Exhibition, and *The Arcade, Lady Chapel, Ely*. This, we are informed, is an enlargement from a small hand-camera negative, but it possesses qualities which those who make a feature of architectural work would do well to study. It is merely a piece of architectural detail, and, as a subject, would be condemned by many of the extreme school as impossible to treat pictorially; still, Mr. Lamley has managed to infuse into it a sentiment entirely wanting in most renderings of such subjects, and this

without sacrificing what old-fashioned photographers term technical excellence. Mr. G. F. Blackmore received a bronze medal for

"The shadow of the scowling storm
May overcast the noonday ray,"

a study of sky, water, and shipping, which is a pleasing picture, and also has the not too common merit of really conveying the impression of the atmospheric condition suggested by its title. A bronze medal each was awarded to Mr. M. W. Cockerell for *Chill with Winter's Melted Snow*, and to Mr. A. E. Cockerell for

"Sleeping fields and hedgerows,
With a silence deep and white,"

the subject of which is, in each case, indicated by its title. Both pictures are treated with considerable breadth, and will find many admirers. Mr. J. Wilson also received a bronze medal for *In Port, Boulogne*, noticeable for the very beautiful rendering of the water.

Although he failed to obtain recognition at the hands of the Judge, Mr. H. Selby's pictures were worthy of study, and good work was shown by Messrs. A. Beard, R. Horton, W. Taylor, and H. Blackmore.

THE CALCUTTA INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

We append the Judges' awards made at the Calcutta International Photographic Exhibition, which, according to the Calcutta press, appears to have been highly successful.

Class I. (Landscape).—Challenge gold medal presented by Maharaj Kumar P. K. Tagore, for the best photograph by an amateur member of the Society, Arthur Casperez, for *In Shade and Shelter of the Cool Himalayan Hills*. The Society's silver medal (open competition), J. H. Gear, for *Silvery Morn*. Percy S. Lankester, for *A Pretty Lane*. Silver medal presented by the Maharaj Kumar P. K. Tagore, for the best bromide enlargement by an Indian amateur, Sarbatosh Bose. The Society's silver medal (for amateur members of the Society), J. A. Simson, for *Tolly's Nullah*. Dr. G. Watt, C.I.E., for *A Wall of Ice, Kulu*. J. Downing, for *The River*. Extra silver medal, A. Thomson, for *Shadipur, Kashmir*. E. A. Bradford, for *The Ever-restless Sea*. N. Giannacopulo, for *Reflections*. The Society's bronze medal (open competition), John Gunston, for *Mother's Posy*. C. F. Inston, for *The Last Faint Rays*, and *After Storm—Peace*. Richard Keene, Ld., for *How Fair the Limpid Dove*. H. Bailey, for *On the Hooghly*. S. F. Clarke for *River Jogne*. W. Smedley Aston, for *Low Tide*. W. Thomas, for *Corner of a Kentish Common*. The Society's bronze medal for amateurs of the Society. V. Pont, for *Pindri Valley*. J. F. W. Johnson, for *After Glow*. A. Fleming, for *Marlow Regatta*.

Class II. (Architecture and Interiors).—The Society's silver medal (open competition), C. S. Baynton, for *Cloister, Gloucester Cathedral*. The Society's bronze medal, J Bulbeck & Co., for *Winchester Cathedral, S. Processional Aisle*.

Class III. (Portraits and Groups).—Gold medal presented by A. H. the Nawab Ahsanollah Khan Bahadur (open competition), Alfred Stieglitz, for *My Father*, and *Portrait Study*. The Society's silver medal (open competition), Harrington & Norman, for *Portrait Study*. Bourne & Shepherd, for *Reminiscences*. Miss Agnes Jennings, for *Study of a Head*.

Class IV. (Genre Pictures and Studies).—Special medal presented by H. E. The Viceroy for the best photograph in the Exhibition (open competition), Mrs. E. V. Clarkson, for *Say Yes*. Gold medal presented by H. H. the Maharajah Jotendro Mohan Tagore (open competition), W. M. Warneuke, for *Work and Play*. The Society's gold medal (open competition), Fred. Marsh. The Society's silver medal (open competition), Edgar G. Lee, for *The Evening of Life*. The Society's bronze medal (open competition), Walter Welford, for *For Some must Lose, that Others may Win*. The Society's silver medal (for amateurs of the Society), G. P. Symes Scott.

Class V. (Photographs of Objects in Motion).—The Society's silver medal (open competition), S. A. Hands, for *In Tow*. The Society's bronze medal (open competition), Herbert Palmer. The Society's bronze medal (for amateurs of the Society), T. H. Holland, for *Becalmed in the Bay of Bengal*. W. R. Donogh.

Class VI. (Lantern Slides and Transparencies).—The Society's silver medal (open competition), Charles Simpson, for a set of six Norwegian lantern slides. The Society's bronze medal, W. A. Fraser, for a set of twelve flower lantern slides.

Class VII. Photo-mechanical Process).—Gold medal presented by the Society for the best photograph by an Indian gentleman, Maharaj Kumar P. K. Tagore, for a shadowgraph. The Society's bronze medal for a set of eighteen stereoscopic views, by R. W. Copeman. A set of twelve stereoscopic transparencies, by A. W. Westropp.

In addition to the above awards the following exhibits are highly commended: *By the Frigids*, by Miss Watson. *Lady Mackenzie and her Son*, by Mrs. Douglas White. *Evening on the River Wey*, by T. M. Brownrigg. *A Derelict*, by W. Thomas. *A Dream of the Sea*, by W. Norrie. *The Thames at Shepperton*, by Viscount Maitland. *Nature*, by A. Batoulin. *A Pathway to the Sea*, by C. R. Pancoast. *Kumaon Snows*, by Dr. Govan. *Surf at Mablehead*, by Robert L. Bracklow. *Snows from Ranikhet*, by T. H. S. Biddulph. *Gun Detachment, 5th Mountain Battery, on the March*, by Fred Bremner. Portrait of a Lady, by Emil Krezzen. *La Haine*, by Clarence B. Moore. *Waiting for the Wind*, by C. F. Baynton. *From Town to Town*, by Mrs. Francis Clarke. *Critics*, by Paul Martin. *Bicycle Races*, by Edgar Scamell. *A Stiff Breeze*, by C. S. Inston. *A Marshland Study*, by C. S. Baynton. *View in Shang Nallah, Ladak*, by Major W. K. Downes. The following stereoscopic views were also commended: A set of forty-two stereoscopic views, by E. B. Docker.

News and Notes.

Cautious.—"This photograph doesn't look a bit like me," said Jarley to the photographer. "I know it," said the photographer. "I was afraid to make it exactly like you for fear you wouldn't take it."

Royal Photographic Society: Technical Exhibition.—As stated in our report of the meeting of the Royal Photographic Society in another column, the Council have determined to hold a Trade and Technical Exhibition in the spring of next year.

Leytonstone Camera Club.—The Fifth Annual Dinner will take place at the City Arms Restaurant, St. Mary Axe, E.C., on Wednesday, March 10, at 6.30. The Stewards have in hand a high-class entertainment to follow, so that a very pleasant evening will be spent.

The Salon de Photographie (Paris) announce their Fourth Annual Exhibition, which will be held from April 14 to April 28 next. It appears from the prospectus that the Exhibition is conducted on similar lines to that of the London Photographic Salon. Particulars may be obtained of the Secretary-General of the Photo-Club de Paris, 40, Rue des Mathurins, Paris.

A development of radio-photography by means of the X rays has been described to the Paris Academy of Sciences by MM. Remy and Contremoulin. They treat the soft parts of animals with a preliminary chemical deposition of chromate of silver on the surface and in the tissues, and in that way obtain radiographs or skiagraphs, in which the muscular bundles as well as the muscles are seen clearly. The chrome silver method of staining has been used by microscopists with advantage, and probably it will be found of special utility in connexion with Röntgen-ray work.

Acetylene Demonstration at Glasgow.—The Scottish Acetylene Gas Company gave a demonstration of acetylene gas as applied to portrait photography, in the premises of Messrs. George Mason & Co., Glasgow, on Friday evening, February 19, when there was a very large attendance of professional and amateur photographers and those interested in the new light. Mr. Gilfillan presided, and Mr. W. J. Mackenzie, of the Company named, demonstrated the value and importance of the light as applied to the purpose named. His remarks and explanations were listened to with interest, and the illustration was derived from one of the largest patterns of photographic reflectors containing fifty 00000 burners. The gas was obtained from one of the Company's two and a half cubic feet photographic pattern generators. Several photographs were taken, and some of those present took away the plates to develop them in their own dark rooms. The exposures lasted from two to five seconds, some over-exposed negatives being got. Several groups of well-known professionals were taken, and among those present were Mr. Hampton, Secretary of the Association, Mr. Stevenson, Mr. Mackenzie, and Mr. Platt from Airdrie.

Acetylene Gas and Fire Insurance.—The insurance offices seem to have at last come to some kind of understanding as to the terms upon which insurances for premises used for the generation or storage of acetylene will be accepted, and we understand that the following rules have been drawn up by the Associated Fire Offices:—(1) That the storage of calcium carbide, liquid acetylene, and (or) acetylene gas, and every apparatus, whether portable or otherwise, for the generation of such gas, must be only in a building detached at least ten feet at the nearest point from every other building; (2) that suitable valves or devices for controlling the pressure of the gas must be placed inside the detached building, and a cut-off provided between such building and the building supplied with the gas; (3) that, in addition to the above, the piping in the building in which the gas is used must be provided with a pipe outlet into the open air, controlled by a safety device so arranged as to let the gas escape outside the building whenever the pressure of the gas exceeds four ounces to the square inch. We are further informed that "the offices agree not to admit liability for explosion of acetylene gas occurring elsewhere than in the building which is, or the contents of which are, the subject of the insurance."

Sunstroke in the Army.—Writing in the *Army and Navy Gazette*, Captain F. S. Dugmore thus revives an old suggestion: "Before the vexed question of Army head-dress, presumably interchangeable, is finally decided, a reminder may not be unseasonable touching recent discoveries by scientific photographers and Röntgen-ray experimentalists, according to which it appears that actinic rays of light are identical with those which occasion sunburn and sunstroke. Consequently it is manifest that the best protection for the brain and the spine of the soldier would be a layer of some ruby-coloured material in his head-dress and down the back of his tunic. It by no means follows that the helmet—some form of which is, I imagine, pretty sure to be adopted—need show red, though even that could not be more fatally dangerous than the very smart-looking white helmet proved to be at Majuba. Nor should the lining be ruby, the tint of which would soon be modified past recognition, thanks to Tommy's incorrigible predilection for pomatum of all sorts. The protective material should be sandwiched between the outer and inner fabrics of the helmet. This might be covered in khaki—thoroughly workmanlike and not too unbecoming if relieved by a metal plate and a smart puggaree of the regimental facings, both removable on field service."

HACKNEY PHOTOGRAPHIC SOCIETY.—The Fourth Annual Dinner of the Hackney Photographic Society was held on Tuesday last, February 23, at the London Tavern, Fenchurch-street. The President (Mr. Thomas Bedding, F.R.P.S.) was in the chair, and was supported by about sixty members and visitors, the latter including Rev. F. C. Lambert, Mr. E. J. Wall, Mr. R. P. Drage, Mr. J. A. Sinclair, Mr. A. Mackie, Mr. W. Thomas, Mr. C. R. Rowe, Mr. T. Fall, and Mr. W. E. Debenham. The toast list included "Success to the Hackney Photographic Society," proposed by Mr. Fall, and "The Officers," for whom Mr. W. F. Fenton-Jones (the Hon. Secretary) replied. A presentation of a handsome clock and two bronzes was made to the retiring Treasurer, Mr. J. O. Grant, who suitably acknowledged the gift. "Hon. Members and Visitors" and "The Press" (responded to by Mr. Snowden Ward and Mr. C. R. Rowe) were also toasted, and the festivities, which were agreeably diversified by an excellent programme of music, songs, and ventriloquial and mimetic entertainments, terminated with the toast of "The President" and the singing of "Auld lang Syne."

Patent News.

THE following applications for Patents were made between February 10 and February 17, 1897 :—

CAMERAS.—No. 3270. "Improvements in Magazine, Hand, Stand, and like Photographic Cameras." T. C. TWINING.

SCREEN FOR USING WITH LENSES.—No. 3552. "An Adjustable Blind or Screen, to be Used in Conjunction with Photographic Lenses." E. P. BEAUFORT.

CAMERAS.—No. 3643. "Improvements in Pocket, Hand, or other Photographic Cameras." Complete specification. J. WILKINSON and A. WILKINSON.

LAMPS.—No. 3693. "Improvements in Photographic Lamps." U. BEATON.

PLATE BOX.—No. 3722. "Improvements in Grooved Frames, Carriers, or Supports for Holding or Suspending Accumulator Plates, Photographic Plates, and other Plate-like Articles." Communicated by C. Wilh. Kayser & Co. W. P. THOMPSON.

DARK-ROOM BLINDS.—No. 3764. "Improvements in and relating to Blinds for use in Photographic Dark Rooms and Developing Lamps." E. J. B. SCRATTON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
1	Camera Club	Smoking Concert.
1	Ealing	*Negative-making.* Chapman Jones.
1	Gospel Oak	Exhibition.
1	North Middlesex	Informal Meeting.
1	Putney	Prize Slides.
1	Richmond	Lantern Evening: Members' Slides.
1	South London	*Hand-camera Work.* W. D. Welford.
1	Stafford Y.M.C.A.	*Experiments in Photographic Chemistry.* M. Averill.
2	Brixton and Clapham	*The Intensification and Reduction of Negatives.* Thomas Bolas, F.C.S., &c.
2	Hackney	Annual General Meeting.
2	Isle of Thanet	*Architectural Photography.* H. W. Bennett.
2	Lewisham	Developing Competition.
2	Wolverhampton	*From Newbridge to Evesham by Water.* H. E. Perry.
3	Borough Polytechnic	Lantern Night.
3	Edinburgh Photo. Society	*Photography as an Aid to the Architect.* Hippolyte J. Blanc, R.S.A.
3	Leeds Camera Club	Exhibition of Members' Prize Prints and Lantern Slides for 1896 Competitions.
3	Leigh	Competition: Boats and Boating.
3	Leytonstone	*A Lens and its Action.* H. P. Hood.
3	Photographic Club	Trade Night: Novelties, &c.
3	Woodford	Prize Slides.
4	Camera Club	Captain Abney, C.B, F.R.S.
4	Goldsmiths' Institute	Lantern Evening.
4	Leeds Photo. Society	*Instantaneous Photography, introducing the Latest Developments in Film-changing Devices.* F. O. Bynoe.
4	London and Provincial	*Carbon Printing.* G H. James.
4	Oldham	*Photo-micrography.* J. Butterworth, F.R.M.S.
4	West Surrey	Social Night and Discussion on Outings.
5	Croydon Microscopical	Meeting to arrange Summer Excursions.
5	West London	*Odds and Ends.* E. Dockree.
6-13	South London	Eighth Annual Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 23,—Technical Meeting,—Mr. H. Chapman Jones, F.I.C., F.C.S (Vice-President), in the chair.

Mr. T. R. DALLMEYER read a paper entitled, *The New Stigmatic Lens* (*f*-6) *and the Astigmatic Corrector.* Dealing first with

THE STIGMATIC LENS,

he said that, upon the introduction of the new Jena glass, with a high refractive index and low dispersive power, opticians at once saw their way to eliminate the errors of astigmatism and curvature of field. The first to publish and patent a lens necessitating and utilising the employment of the new glass was Dr. Schröeder in his Concentric lens—a lens which well merited its cordial reception, and the only fault of which lay in its low intensity—and this was followed by the instruments of Messrs. Zeiss, Von Höegh, Voigtlander, and others; but the construction of Mr. Aldis' Stigmatic lens differed essentially from the work accomplished by foreign contemporaries. In it the converging lenses were throughout of high refractive power, and the diverging lenses of low refractive power, the correction for spherical aberration being obtained by a small convex meniscus air space in the back lens. The *f*-6 lens covered a circle of illumination of 85°, the portrait form at *f*-4 covering 60°; over the complete angle of 85° the deviations from perfect flatness were most minute, so that the lens might be used at full aperture for instantaneous work upon a plate the diagonal of which equalled the focal length of the lens, and also with slight stopping down over plates whose diagonal was nearly twice the focal length. Mr. Dallmeyer showed a series of prints from negatives taken with the lens by a method devised by Mr. Kapteyn, affording a comparison of the use of the diaphragm at four different intensities on one plate. The front combination consisted of two lenses cemented together, the outer one a double convex lens of heavy baryta crown and a double concave lens of light silicate flint. The back combination comprised three lenses, two of which were cemented; inside was a concave lens of light silicate flint cemented to a double convex of heavy baryta crown, and behind these, with a small air space, a light silicate meniscus flint. The claims made for the lens were, that it combined great rapidity with absolute definition over a plate including an angle generally chosen for most subjects; the possibility of use on much larger plates as a wide-angle lens with moderate stopping down; and also the possibility of using the front combination as a narrow-angle single lens for a plate of the size of which it was intended as a whole.

THE ASTIGMATIC CORRECTOR

was intended to eliminate the errors inherent in some of the older types of lenses, such as those constructed on Petzval's original design. It would perfectly correct astigmatism, and give a practically flat field to a Petzval lens, the focus being lengthened about one-half. The residual spherical aberration was negative, and required a stop of about *f*-7 to eliminate it, and the corrector would convert a *carte-de-visite* lens of eight and a quarter inches focus to one capable of covering a whole-plate.

Mr. A. KAPTEYN, referring to the testing of lenses, described the arrangements he had made for the purpose. Having ascertained that the end wall of his room was truly vertical and flat, he covered it with prints and diagrams of a suitable character and in symmetrical patterns, and arranged a bridge or platform to run on rails to and from this test screen, the rails being marked off in fractions of an inch to ensure parallelism of the bridge and screen. The camera was accurately levelled and firmly screwed down upon the bridge, one with a solid body being used in preference to one with all the latest movements, in order to secure that the focussing screen was perfectly parallel to the test screen. To ensure that the position of the plate coincided with that of the focussing screen, the central division was removed from the dark slide, and the ground glass inserted in the position to be afterwards occupied by the plate.

Mr. CROUCH thought it a matter for congratulation, that a lens had been produced in this country which compared most favourably with the results attained by Continental competitors.

Mr. J. R. GOTZ also congratulated Mr. Dallmeyer upon the new lens, and particularly as to the astigmatic corrector. He remarked that it was for a long time recognised—by Steinheil amongst others—that the elimination of astigmatism would be possible if glasses could be obtained of the character of the Jena glass.

The CHAIRMAN spoke in terms of the warmest admiration for the lens described in the paper, and remarked that so-called "anastigmats" were not always to be preferred to lenses of older form, for they frequently had faults which considerably detracted from any advantages which they might possess. He regarded it as a specially good point that the front combination could be used as a single lens, with a focal length of one and a half times that of the whole system, which was a very much more convenient focal length than was generally obtained by halving an ordinary rapid doublet.

Mr. DALLMEYER, replying to one or two questions, said the full aperture of a 2B lens (*f*-3) became *f*-5·6 when the corrector was added, but it had to be stopped down to *f*-7 to eliminate spherical aberration. The general effect of the corrector would be to benefit any lens which was made of the older kinds of glass. The *f*-7, above mentioned, represented the value of the stop in relation to the whole combination, including the corrector, and not simply to the original lens.

THE PHOTO-CHROMOSCOPE.

Mr. F. E. IVES exhibited and described the latest and perfected form of his "kromskop," the principle and construction of which have already been fully dealt with in our pages from time to time. Several of the instruments were provided for inspection, six being illuminated by means of one electric arc light, and one by a Welsbach incandescent gas lamp.

The meeting was very largely attended, and at the close of the business the pictures in the kromskops were examined with much interest and admiration.

In reply to a question, Mr. IVES said the camera which he used for landscape "chromograms" required an exposure of about one minute in sunlight, but the exposure could be much shortened by employing a different form of camera, which, however, necessitated very delicate manipulation, and was, for that reason, unsuitable for general use. One lens produced the three stereoscopic pairs of images on one plate at the same time, Mr. Theodore Brown's "stereoscopic transmitter" being attached to the camera.

ELECTIONS.

The CHAIRMAN announced that the Council had elected the following officers:—*Hon. Secretary:* Mr. Horace Wilmer.—*Hon. Librarian:* Mr. Edgar Clifton.—*Hon. Solicitor:* Mr. Francis Ince; also that the vacancies

caused by the first two appointments had been filled by the election of Mr. A. Haddon and Major Lysaght.

A Technical Exhibition.

The Chairman also stated that the Council had adopted an interim report of a Committee to the effect that a Trade and Technical Exhibition should be held, if possible, in the spring of 1898, and had decided to forthwith announce the same in the press.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 18,—Mr. R. Beckett in the chair.

The Hon. Secretary announced that he had received from the Gem Dry Plate Company a copy of their Almanac for 1897, and said that the Company would be pleased to send a copy of same to any member who applied. Referring to the programme for the next quarter, he requested the members to send in their names, with the titles of the subjects of papers to be read, at an early date, as he wished to prepare the programme in good time.

Mr. Bedding said he thought the Association might avail themselves of the Affiliation lectures, and that Mr. Chapman Jones be invited to read his paper on *Negative-making*, which he was sure would be worth listening to.

Mr. Wall seconded this proposal. He also thought that the younger members should come forward with papers. He endorsed everything Mr. Bedding had said, and that the authors themselves ought to read the papers, as suggested by Mr. Freshwater.

Mr. Mackie suggested that Mr. Macintosh might be asked to read his paper on *Intensification*.

Mr. Bedding's suggestion was carried unanimously.

Mr. French handed round some new lantern masks, brought out by the Prosser-Roberts Company after designs by Mr. Oakden.

The Hon. Secretary then announced that the slides to be shown that night were by Dr. Kaempfer on *Spanish Architecture*, and some by Dr. Miethe of animals, taken with a Voigtlander's Collinear No. 3 lens. The slides were, he said, French size, $4 \times 3\frac{1}{4}$, without masks, and were sent to England with the object of getting an opinion on German slide work. Dr. Miethe was anxious to know.

Dr. Miethe's were shown first, and, by the title, the members expected to see slides of animals, but the greater number of them were of children, women, shipping, snow scenes, &c. Then came Dr. Kaempfer's slides of *Spanish Architecture*, but many of these slides were of English cathedrals, Hampton Court, Oxford and Cambridge Universities, Roman bath (Bath), Stonehenge, and it was apparent that they were all copied from silver prints; in fact, Mr. Rapson recognised one picture as taken from a picture by Mr. Bedford, with Mr. and Mrs. Bedford, jun., in the foreground. The slides did not run through the carrier with ease, some of them stuck, and the carrier had to be removed from the lantern before the slide could be extricated.

Suggestions as to the second-rate quality of the slides were freely remarked. Some thought they might be passed through lantern *à la* cinematograph, and other such remarks, and everybody was convinced as to their being copies of prints, and that there did not appear to be a direct lantern slide amongst them.

Mr. Wall proposed a vote of thanks to Mr. Snowden Ward for his good intention in lending the slides, but he felt sure Mr. Snowden Ward was not aware of their quality. Mr. Wall thought they (referring to Dr. Miethe's and Dr. Kaempfer's slides) were the worst slides ever shown at the London and Provincial Photographic Association, and he thought that, if they were to be shown to the various societies in England, such societies should be informed what to expect. He hoped they were not good specimens of Continental work.

Mr. Welford seconded, especially as to societies being informed as to the quality of the slides. He said some French, Belgian, &c., slides he had seen made from negatives certainly showed good technical results. He said Continental slides generally were in no way to be compared to English and American.

Mr. Wall had not seen many good United States slides, and referred unfavourably to Chicago Exhibition slides shown at the London and Provincial Photographic Association some time back.

Mr. Drage referred favourably to Mr. Beach's (New York) slides as being very good.

Votes of thanks were proposed to Messrs. Welford, French, and Kellow for the patient way in which they had manipulated the lantern and slides.

PHOTOGRAPHIC CLUB.

February 17,—Mr. A. E. Staley in the chair.

Mr. S. Herbert Fry read a paper entitled

Some Rule-of thumb Tests of Photographic Lenses.

By means of a series of illustrative enlargements of a ruled screen, the reader of the paper described the characteristic peculiarities of Zeiss, Goerz, rapid rectilinear, triplet, and stigmatic lenses.

MANCHESTER PHOTOGRAPHIC SOCIETY.

February 11,—The President (Mr. T. Chilton) in the chair.

Mr. T. Morley Brook read a paper on

Figure Studies and Pictorial Photography.

"The introduction of figures into photographs is always attended with a certain amount of risk, but, when successfully accomplished, it is pre-eminently interesting. There are two ways in which figures can be utilised in making pictures—in landscapes as figure studies, and as portraits pure and simple. Before introducing a figure into a landscape, be very sure that there is a real necessity for its being there at all. It should either aid the composition or enhance the interest in some way, that is, draw attention from or to some part of the picture, emphasise or break a line, contrast or balance a mass of light or shade. Figure studies may have quite a value of their own as objects of art, and I think that the amateur photographer might profitably devote more time and attention to the production of figure studies and fancy portraits. There should be no lack of subjects, for they are close at hand, in every home, at every street corner, and in every country place."

Mr. Harry Wade then followed with a few notes on

Flashlight Photography and Artificial Light Portraiture.

Portraiture without the aid of the sun as an illuminant is gradually becoming more popular amongst professionals, the light used being electric (arc and incandescent), incandescent gas, and flashlight; but there are few amateurs who are ambitious enough to go to the expense of an installation of electric light, so are content to use magnesium, either ribbon or in the form of powder. For ordinary drawing-room portraiture the ribbon is the better form, as the ash falls downward and does not spead about the room, as is the case of the flash. Reflectors should not be used in portraiture, and softness obtained by diffusion, the light being filtered either through muslin or tracing cloth. Mr. Wade, who is chief operator at Mrs. Wilkinson's, then exhibited a number of examples of electric-light portraiture, the installation being Adamson's incandescent. No reflectors were used, and transparent shadows obtained by diffusion. A demonstration of flashlight was then given by Mr. Wade, using two lamps and a muslin diffuser, and several plates were exposed, the results of which will be exhibited at the next meeting.

Brixton and Clapham Camera Club.—February 16, Mr. J. W. Coade presiding.—The Affiliation lecture on

Lantern-slide Making,

by Mr. J. A. Hodges, F.R.P.S., was read by the Secretary, and received from a large audience the close attention it deserves. It was well illustrated with explanatory slides, and, while containing much information for the more experienced, should render lantern-slide making easy to the beginner. A pleasant feature in the evening's proceedings was the Chairman's presentation to Mr. F. W. Levett of the sum of five guineas voted by the Club in recognition of his services as Secretary.

Croydon Camera Club.—The thirtieth public display of the Croydon Camera Club, on Wednesday, February 17, drew another big audience, there being much difficulty in accommodating all who wanted to see. Members' slides came first. The President showed an interesting interior of Manwood-court, depicting a corner of the studio of H. M. Page. The room is historical, as where "Mrs. Mayres" (*i.e.*, the Mayoress of Sandwich), when the above building formed the "scole-house," "made the Quene's Majestie (Elizabeth) a banquet," which "the Imperial votress" was so pleased with that after dinner she had some of the dishes "carried to her lodgings!" A view of the old picturesque Merstham windmill was peculiarly interesting, as it has just been pulled down. Messrs. Harris, Wightman, and A. J. Noaks showed small sets, the cats of the first-named and the torpedo-boats of the last-mentioned meeting with favour. Mr. W. H. Rogers was represented by a score or so of pictures, several of which were distinctly above the average in pictorial aim and achievement. Specially approved by Mr. Maclean (who explained these and foregoing slides) was *Summer Evening at Chilworth*. The audience thoroughly endorsed the President's remarks, and still more warmly received a sensational but less meritorious, moonlight effect, produced by sunlight. Mr. A. E. Isaac, who worked the lantern, spoke on behalf of a charming little collection of views, taken during the Club outing to Guildford, contributed to by himself and Messrs. Pusey and Rogers. Several views deserved and obtained the audience's emphatic applause. Consequent upon an acutely relaxed throat, Mr. Walter D. Welford was unable to attend and explain his slides, depicting *The Humour and Pathos of the Streets*. At the last moment the President made the best he could of the notes supplied by Mr. Welford. The series of "street snaps" were many of them of considerable intrinsic or technical interest, and threw a sufficient light upon the habits, manners, and appearances of a number of waifs and strays, of which photographs had been taken in the slums of our large towns. It is a pity Mr. Welford could not be present to remark upon the cordial and appreciatory reception with which his suggestive and clever slides were received. The display terminated by the exhibition of a series of ten animated scenes, which a member of the Club, Mr. D. Prosser Roberts, of North End, provided and worked. With these the large assemblage was evidently greatly delighted, as well they might be. Amongst the best of the scenes were the *Railway Station*, *Cycling*, and *Skirt Dancer*, the last-named being so coloured as to exhibit the prismatic changes produced by red, green, and otherwise tinted limelight. The intervals were made delightful by several popular selections given by a banjo team, under the direction of Miss Cumbers.

Gospel Oak Photographic Society.—February 16, the Vice-President in the chair.—Mr. Powell gave a demonstration on

Platinotype.

The introductory remarks of the member were listened to with great interest, and the description of the cold-bath process was extremely lucid, as both its advantages and its shortcomings were dealt with in a most impartial manner. Mr. Powell thought a great deal of the process, and considered the results were absolutely permanent. The great difficulty appeared to be in the storage of the paper, but by the use of the calcium this was entirely got over. The lecturer then proceeded to develop some of the prints which he had brought with him, and the results were greatly admired by the members present. A vote of thanks to Mr. Powell, and to the Platinotype Company, who had provided some of the prints that were developed by the lecturer, brought the proceedings to a close.

Hackney Photographic Society.—February 16, Mr. R. Beckett presiding.—On the subject of *Animal and Bird Life*, Mr. Thomas Fall showed a large number of exceedingly fine slides illustrating various breeds and kinds of dogs, cats, birds, and other domestic animals, and he gave some interesting anecdotes concerning the originals of many of the portraits.

Leytonstone Camera Club.—February 17, Mr. F. Wates in the chair.—Mr. E. E. Hill, M.B.M.S., of Messrs. R. & J. Beck, Limited, gave a lecture on

PHOTOGRAPHY WITH THE MICROSCOPE.

The lecturer pointed out the error into which most people fell in considering that the subject was full of difficulties, but he hoped to prove to them that it was perfectly simple when once the general knowledge of the subject had been overcome. There was only one drawback, and that was the initial expense, and that need not be so great as most people imagined. He would deal with the subject in two parts. Firstly, he described the necessary apparatus and the use of same, which was most lucidly done. One of the chief points to be observed was the correct centering of the light, and also there should be no absolute contact between the microscope and the camera. For a luminant he used the paraffin lamp, and found it thoroughly reliable for the purpose. After answering a number of questions, he proceeded with the second part of his subject, consisting of the exhibition of a number of microscopic slides upon the screen representing the anatomy of the blowfly and other subjects. One slide of particular interest, and evoking much enthusiasm, represented the initials "L.C.C." of the Club, taken through the facets of a fly's eye. Various data and useful information was pointed out as each slide was put through, and Mr. Hill, who had proved himself so thoroughly at home with the subject, the entire lecture having been extempore, was accorded a most hearty vote of thanks for a most interesting and simple exposition of a seemingly difficult branch of the photographic art.

North Middlesex Photographic Society.—February 15, Mr. H. Smith in the chair.—Mr. C. O. Gregory gave a paper entitled

PRINTING FROM THE NEGATIVE.

He said the negative should be made to suit the paper intended for the print. He described the best method of storing the negatives for easy reference, his way being the use of sheets of paper in the form of a book, the negatives being between the leaves, with particulars written on the sheets. He showed how a negative could be improved by shading parts in printing, and by means of matt varnish, also describing how combination prints could be made.

FEBRUARY 22, Mr. S. E. Wall in the chair.—Mr. C. H. OAKDEN gave a lecture on

ARCHITECTURAL PHOTOGRAPHY.

He gave what he considered the essentials for good work in this direction, namely, a good, firm camera, square pattern for preference, with a long rising front, double swing back and swing front, a focussing screen ruled in squares, and a few clear spots to facilitate focussing, formed by cementing on a few microscopical cover glasses with Canada balsam, and a spirit level. An ordinary rectilinear lens had a limited use in this connexion, a wide-angle or a portable symmetrical often proving more useful. The stand should be rigid and shod with corks or indiarubber to prevent slipping on stone floors. A plate rich in silver was almost always necessary, and an isochromatic plate was useful when photographing dark oak or windows with much stained glass. General views of cathedrals, &c., were mostly disappointing. He preferred to photograph the details of the structure, the aisles and transepts being often more suitable subjects. He showed a good number of prints, mostly of these subjects, and about fifty lantern slides were put through the lantern.

Polytechnic Photographic Society.—February 18.—Mr. J. H. GEAR gave a lecture upon

COMBINATION PRINTING.

He said: "The object of combination printing is to make pictures by photography which, on account of the mechanical limitations, cannot be produced at one operation. There are numerous exponents of the photographic art always ready to advocate the securing of clouds upon the same plate, and stand aghast with outraged feelings against the idea of making a picture if it is not done by uncapping the lens once. I do not know a person who is capable and can show us some artistic gems produced by the so-called 'faking,' decline to do it on principle, for it must be conceded by all that the greater the manipulative skill of the artist, or, if you like, the 'faker,' the finer will be the photographic production. If the sky upon a particular day had no clouds in when the photograph was taken, why—assuming, of course, that I am appealing to the artistically inclined—should we portray nature in one of her inartistic moods, since we have the power in our hands to present to our friends pictures which please and appeal to their cultivated tastes? Before entering into the more practical part of our subject, I would strike one note of warning. When you resort to methods of supplying by hand what we are unable to secure by the more mechanical means at our disposal, be careful in every detail, or, for a certainty, your sins will find you out. Be careful that the lighting of the landscape is the same as the lighting of the clouds. Never print sharply focussed clouds into a subject the focus of which has been more or less suppressed. I will now for practical reasons, divide my subject into seven headings, viz.: I. The introduction of objects into water foregrounds. II. The introduction of the graduated or tinted sky. III. The introduction of figures. IV. The introduction of clouds when the distance is full of atmosphere. V. The introduction of clouds, with light objects, as sails, spires, &c. VI. The treatment of thin skies in landscapes. VII. The various manipulations when printing with processes other than the printing-out." After explaining the above headings, the lecturer threw upon the screen some thirty slides of his pictures to illustrate the various points touched upon. March 4, a paper by Mr. A. H. White upon the *Carbon Process*.

Richmond Camera Club.—February 15.—The Putney Photographic Society responded to an invitation of their brethren of the Richmond Camera Club, and gave an excellent display of lantern slides before the members of the latter Society and their friends. The slides shown, which were the work of quite a large number of members, were announced by Dr. SHEPHERD, the Vice-President of the Putney Photographic Society, and were greatly appreciated. Mr. CEMBRANO, President of the Richmond Camera Club, in proposing a vote of thanks to the visitors, heartily congratulated them on the high standard of excellence of the slides throughout.

Birmingham Photographic Society.—February 16. — An Open Lantern Evening was held at the Lecture Hall of the Y.M.C.A., the lecture being by Mr. A. E. BAYLISS, on the subject of a recent photographic trip from

LUCERNE TO THE LAKES MAGGIORE AND COMO.

The slides, Mr. Bayliss said, were from film negatives, taken with a hand camera. It was the general opinion of those present that a finer collection of slides was rarely seen at a meeting of the Society. The lecturer's description of the slides and the splendour represented was very graphic, particularly those of Isola Bella and its magnificent gardens. Several sunset effects were greatly appreciated, as were also a few slides representing the tops of the mountains with breaking clouds. Mr. Bayliss was very heartily thanked for his lecture, on the proposition of the Chairman.

Wakefield Photographic Society.—February 19.—Paper on

NEGATIVE-MAKING,

by Mr. CHAPMAN JONES (Affiliation of Societies lecture). After the paper a discussion was initiated by the PRESIDENT, and was taken part in by Messrs. Briggs, Robson, Rev. G. Jones, the Hon. Secretary, and others. The HON. SECRETARY read a scheme for a members' competition for lantern slides and prints for which one prize had already been offered, the scheme being to restrict the competition to local views, either specially indicated or to a radius of, say, five miles round Wakefield. After a short discussion it was decided to leave it to the Committee to settle all points. The HON. SECRETARY mentioned that the Heckmondwike Society was desirous of meeting the Wakefield Society some Wednesday afternoon during the summer for a ramble at Heath, &c. This also was left to the Committee.

Wolverhampton Photographic Society.—February 19.—Mr. J. GALE delivered a lecture, entitled

THE GARDEN OF ENGLAND,

being a record of tours in Kent and Sussex. The lecture was illustrated by a great variety of lantern slides. Rochester, Canterbury, Hastings and Battle Abbey, Tenterden, Maidstone, and Bodmin Castle were all fully illustrated and described. Many ancient churches, quaint old houses and villages were shown, and their traditions referred to, also the farms and hopyards and agricultural scenery and operations. All the pictures were commendable from an artistic point, and the necessity of this was commented upon by Mr. Gale.

FORTHCOMING EXHIBITIONS.

1897.		
February 26, 27	Glasgow *Evening Times* Camera Club.	The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.
,, 26, 27	Woolwich Photographic Society.	Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.
March 6–13	South London Photographic Society.	Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
April 3–May 1	*Edinburgh Photographic Society.	Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.
,, 19	Beverley Photographic and Sketching Society.	Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHY IN COLOURS.

To the EDITORS.

GENTLEMEN,—The article in the current issue by Mr. W. Gamble turned my thoughts to colour photography, and, although I cannot suggest a discriminating medium for the primitive colours, the idea strikes me that they, as well as a neutral tint, might be represented in one negative.

The plan I propose is to employ a diaphragm in the lens, with four openings suitably arranged, three of them covered with the primary colours, and the fourth left clear, each approximately proportioned in size to the respective exposures required.

If a somewhat coarse half-tone screen be used, I should expect to find represented through each opening (at a certain distance) a group of dots, each of which would be rendered in accordance with the colour of the

original. In order to print on zinc, &c., from such a negative, it would be necessary to block out, with a screen of the same scale as that originally used, three of the four dots in each group (this, to me, would seem the most difficult part of the process, but I think it might be done), and the resulting plate would form one of the colour blocks. Four blocks thus made would represent the three colours and a key, which might be printed in black or grey, according to taste.

This plan only requires one negative, and, by correct registering, each dot would be separate from the next, unless strongly lighted, when it might overlap its neighbour at the edges.

Hoping that this rough outline may be of use to those who have the opportunity of trying it,—I am, yours, &c., J. A. C. BRANFILL.

25, *Rosendale-road, West Dulwich, February* 22, 1897.

BENNETTO'S COLOUR PROCESS.

To the EDITORS.

GENTLEMEN,—My attention has been called to the comments, in your Editorial columns of February 12, upon my Process of Colour Photography, which are as follows: "We are informed, on excellent authority, that a frame of specimens produced by the Bennetto method was sent into the Royal Photographic Society's Exhibition last September, and submitted to the Hanging Committee, a member of which, one of the ablest photographers of the day, tells us that he was not favourably impressed with these so-called photographs in natural colours, which appeared to him no better than the kind of result produced by the old familiar crystoleum process."

These statements are absolutely false. (1) *I never submitted my work for Exhibition.* (2) *No colour pictures have* EVER *left my hands for* ANY *purpose whatsoever*, and (3) the results obtained by me do not bear the slightest resemblance to any such absurd and childish process as that known as the "crystoleum." My process will be shown to and known to the world shortly, and you will then be able to judge for yourselves as to its merits.

In the mean time I must ask you to abstain from publishing any further incorrect and misleading statements.—I am, yours, &c.,

February 16, 1897. J. WALLACE BENNETTO.

THE SOUL OF TRADE AND JEALOUSY.

To the EDITORS.

GENTLEMEN,—As a correspondent, signing himself J. Wickens, has made a reference to me in your issue of the 12th, I beg your permission to reply thereto, especially as his remarks are misleading.

First of all, my previous letter evidently had the desired effect and proved too true to be contradicted.

Secondly, the remarks of the correspondent above referred to exhibit jealousy, the very thing he *appears* to be complaining about.

Thirdly, I am obliged for his assistance to advertise my business by procuring and distributing my price-lists, &c.

The undisputed fact which still remains is, that customers who were attracted away by the bait of new comers, viz., first cabinet gratis, 15*s.* per dozen after, have returned to me, willingly paying 21*s.* per dozen for cabinets.

"Small cities" sometimes contain men of *small minds*, hence the difficulty of "combining." Men who cry out about "cheap work," such as "the 6*s.* 6*d.* enlargement," &c., while they cut down prices, are generally avoided (see enclosed advertisement *re* enlargement for 5*s.* 6*d.*). It is not at all surprising to me that your correspondent, John Wickens, has "never been able to enjoy" what he terms "a chat with a fellow-photographer unless he lives twenty miles distant." He cannot understand this! If he studied *cause and effect*, he would have no difficulty in arriving at a correct solution of the cause of his isolation. Here, again, my experience differs greatly from his. But I must confess *I* never desire "a chat" with men who obtain my quotations for supplying 12 × 10 groups in quantity, then quoting 3*d.* each less to obtain the order, attracting customers by offering "first cabinet gratis." It is really amusing to find a character of this kind calling for "combination among professionals." As to the reference to my having been "across the sea," it is true I have travelled through North America under the auspices of the Canadian Government, who recompensed me, and afterwards paid me for a series of lectures on the country, also purchasing a number of photographs which I had taken on my tours. As to his attempt at a pun, I might be permitted to remark, if he had been to "see" what I have, his mind might be elevated above the platform of a *punster*.—I am, yours, &c., THOS. MILLS.

North Wales Art Studio, Bangor.

P.S.—Under the heading Ex Cathedrâ this week, you have done good service to the profession *re* the "cheap enlargements." Your timely remarks fully bear out the experience of the foremost rank of photographers. It is really most amusing to find those who complain most of cheap work most guilty of perpetrating the same; and I consider *they* ought to be shown up above all.

PHOTOGRAPHY AND DECENCY.

To the EDITORS.

GENTLEMEN,—Observing two paragraphs on pages 107, 116, and 117, on *Photography and Decency*, I see that the writer in the latter one remarks that, if any one is to be censured for harm done in portraying the nude or partially nude human figure, it is the maker of that figure; this is more than absurd. As this is not intended for a religious article, I will only refer the writer to the seventh verse of the third chapter of Genesis, and say no more on this point.

We see plainly, in life around us, that those nations or tribes whose dress nearest approaches the nude (or who do not dress at all) are conspicuously low types of humanity; and so-called civilised people who countenance *portraying* the nude, or who strive to bring it before the mind by vulgar suggestions, are either deluded or else lack that peculiar part of man which alone raises him above the animal.

It is the knowledge of evil which *is* the evil in the nude, and that knowledge has descended from the Creation to every one of us, more or less. We infer, from this, that those who aid or champion such a practice are, as I said before, either grossly deluded, or else are devoid of humanity—in fact, mere animals.

This is only treating the subject broadly; but, when we turn to individual cases, such as photographs of the *commoner* actresses, &c., we see examples of wilful brutishness on the part of both photographer and sitter.

Though this is but another outlet for the natural evil in man, by which he is separated from the purposes of his creation, yet a certain amount of good may be done by denouncing it, which I sincerely trust you will do.—I am, yours, &c., A PROFESSIONAL PHOTOGRAPHER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

A. J. BOUILLIER.—Thanks. See answer to B. H.

WIDE-ANGLE LENSES.—J. BINNEY. See article on the subject on another page.

MOUNTANT.—DAN says: "Kindly inform me of the best gum for stamp photographs."—The best gum arabic will do quite well.

ART.—1. For the purpose named they are probably about equal. 2. We should expect No. 2 to excel in the respect mentioned.

A. LUHTEN.—You probably refer to *The Studios of Europe*, by the late H. Baden Pritchard. You would probably be able to obtain a copy of Carter & Co., Furnival-street, Holborn.

G. S. C.—If your threat is of no avail, we take it that proceedings for the illegal detention of the goods would be your best plan. We should expect a solicitor's letter to have a wholesome effect.

ANGEL.—1. We should advise you to issue a County Court summons. 2. In all probability Messrs. Morris Angel, & Son, Shaftesbury-avenue, W.C., can supply you or tell you where they may be obtained.

EMULSION.—SCREEN writes: "Should be glad to have a good formula for iodised collodion emulsion (wet plate) for making negatives in half-tone for process work."—Better use the wet-collodion process. Iodide of silver does not go well in emulsion.

COLLODION EMULSION.—COLLODION writes: "Would some one kindly give me a reliable formula for collodio-bromide emulsion as rapid as the wet-plate emulsion? I wish to use it for making enlargements, either negative or positive."—Formulæ will be found on page 974 of the ALMANAC.

BENZOLE.—BURNT FINGERS. We do not consider that any caution was necessary. Every one knows that benzole is highly inflammable, and they ought also to know that a varnish made with it, as a solvent, is equally as inflammable. We do not see that any caution should have been added to the formula.

B. H.—We overlooked the reference to chloride paper when answering your first question. A chloride paper that produces a developable impression by one or two seconds' exposure in diffused daylight in a room is not known to us. We used to give twenty seconds in strong diffused daylight out of doors as a minimum exposure

LUMINOUS PAINT.—PHOTOGEORGOS says: "I should be grateful for information as to where I may procure, or how prepare, Balmain's luminous paint if not abusing your indulgence."—The paint is supplied by Mr. Horne, Cow Cross-street, E.C.

WOODEN VESSELS.—S. WILLIAMSON. Coat the vessels that are to contain silver solutions with paraffin wax. The wooden sink, if well made, and is always kept wet, need not be coated with anything to make it watertight. Well-seasoned wood and sound joinery is all that is necessary for that.

STAMP PORTRAITS.—PROVINCE. Cameras fitted with any number of small lenses for taking these portraits may be obtained of any of the large dealers. Consult the advertisement pages of the ALMANAC for the current year, as it is against our rule to recommend any particular manufacturers. Those who supply the cameras also supply the means for perforating the sheets.

PRECIPITATED SILVER.—SODIUM (Burton-on-Trent) says: "I have dissolved 480 grains of nitrate of silver, and at the bottom of the bottle there is a brown precipitation. I suppose it is sodium or potassium. Will you kindly tell me how to test it to find out what it is?"—The precipitation is due to impurity in the water, or to the solution being made in a dirty bottle. It is, of course, not sodium or potassium.

PHOTO-MICROGRAPHY.—A. CAMPION asks: "Could you kindly help me in the following matter? I am engaged in photo-micrography, and do not know how to find out the number of diameters the image is magnified with high powers on opaque objects."—A practical way is to place a micrometer in place of the object, and measure the divisions of it as they are shown on the focussing screen of the camera.

ENCAUSTIC PASTE.—M. WELLS. What preservative action this has upon the print is due entirely to its protecting the image from the atmosphere and from the moisture and other deleterious matter it may contain, that is all; it will not prevent a photograph that contains within itself the elements of fading, say from perfunctory manipulation, from fading. Indeed, according to some authorities, it will enhance it rather than otherwise.

PRINTING.—RUHTOCK says: "I wish to do some printing—copper—but do not know the kind of material to use for sizing. Could you tell me, and would the same do for writing-paper as for ordinary drawing-paper, and will the highly glazed do without?"—This query is not clear. Do you want to do copper-plate printing, or to produce pictures with salts of copper? If the latter, send the formula you propose to use, and we will endeavour to help you.

FADING PRINTS.—W. S. G. As the prints sent were mounted with common "town glue," we should first suspect that as being the cause of fading. Such common glues are convenient for mounting purposes, on account of their slow-setting qualities; but they should be avoided by reason of the impurities they contain, for, as a rule, they are acid. When such a mountant is used, we should say there is no good reason to suspect the mount as being the cause of the fading.

BITUMEN.—VITREUM writes: "May I venture to ask the mode of sensitising bitumen for photographic printing upon glass?"—Bitumen is in itself sensitive to light, but it may be prepared so that it is more sensitive than it is in its natural state by, after finely powdering it, treating it with sulphuric ether until nothing more can be dissolved away. The insoluble, in ether, portion is then dissolved in benzole for use. Bitumen so treated may be purchased of Messrs. Mawson & Swan, Soho-square.

PATENTS.—DOUBTFUL. If the specification of the patent is published, it can be purchased at the Patent Office for eightpence, whether it is a long or a short one. If it is not published yet, there are no means of knowing what the invention is. If, however, the specification is advertised as accepted (though not yet published), it can be seen at the Patent Office on payment of a fee of one shilling. If the patent is ultimately abandoned, *i.e.*, not completed, the specification will not be published at all.

PHOTOGRAVURE. — BEGINNER. If the carbon print blisters while being developed on the copper plate, it will be a waste of the plate to etch it with the perchloride, as the blisters will certainly show when finished. Your trouble seems to arise from your not being familiar with the process of carbon printing. That should be mastered before commencing photogravure by the etching method, or indeed by the depositing method. Both depend upon a perfect carbon picture on the plate to begin with.

THE ROYAL ARMS.—COUNT PRO says: "Will you kindly answer the following *re* use of Royal Arms? If, through the influence of a gentleman, I got permission to photograph a ceremony at which the Queen was to have been present, but who eventually had to be represented by another member of the Royal Family, and supposing I got an order for photographs to be sent to the Queen, and did so, would I be able to procure a warrant to use the Royal Arms, and also call myself 'Photographer to the Queen?'"—In reply: In all probability your attempt to secure a Royal warrant would be unsuccessful. Under the circumstances, we should advise you not to try.

MOUNTANT.—ENAMELLER asks: "Can you recommend a mountant for enamelled prints which will not affect the enamel surface when mounted? We enamel both silver and P.O.P. together, and, as a rule, the albumen prints show badly, while the P.O.P.s are all right. We have tried gelatine, dextrine, and Le Page's liquid glue, and the results are about invariable."—There is no mountant that will not affect the gloss if it is applied direct to the print. The best thing is to back the print, while still moist, on the glass, with a hard and impervious paper. Special paper for the purpose is supplied by all the large dealers.

INVISIBLE INK.—IN DIFFICULTIES says: "With regard to invisible ink, I have made it up to the formula given in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC; but, after the writing is dry, you can still see the words written, but not, of course, green. To be invisible ink, I maintain that it shouldn't be visible in any form whatever. Should any particular paper be used for it? The colour of my ink is a bright red, and this, I think, has something to do with it being visible before warming."—Of course, if there is anything in the composition of the paper that will react upon the ink, the writing will not be invisible. Again, the ink should not be a bright red to begin with. Our correspondent should try again and procure the material from another source.

CHEMICAL FOCUS.—J. W. says: "I have an uncorrected 3½-inch portrait lens by Voigtlander & Son, 6½ inches back focus (glasses in excellent condition). I am desirous of trying your good predecessor's plan of inserting a spectacle glass for correcting same in focussing. Kindly favour me with replies to the following: 1. Should the glass be meniscus or what? and of about what focus? 2. I presume the glass must be removed after focussing the object, and the stop inserted in its place. I should have to send away for the glasses, hence my wishing to know about the focal length."—The focus of the supplementary lens should be such as to lengthen or shorten, as the case may be, the focus of the combination to the extent of the difference between the optical and chemical foci. That will have to be determined by experiment with that particular instrument. As no definite focus for the spectacle lens can be given, it will be better to get several shallow ones and select that which is found best. The lens must, of course, be removed before the picture is taken.

PHOTOGRAPHING BANQUET. — PROFESSIONAL asks: "Would you kindly inform me in Answers to Correspondents on the following point:—I am a professional photographer, and have been called on to do a job I have never done before, viz., to photograph a banqueting hall at night, with between 200 and 300 guests sitting at rows of tables. Now, I should be for ever grateful to you if you would tell me the best way to go about doing this. I have all kinds of cameras and lenses, but I presume I had better use a wide-angle rectilinear of 8½-inch focus on a 12×10 camera. It is the light, though, that puzzles me. Is magnesium powder the best to use, and how can I most effectively use it to light up such a large place, and what would be about the proper exposure with above-mentioned lens at *f*-64? Thanking you in anticipation."—We cannot, in the absence of electric light, recommend anything better than magnesium powder, fired simultaneously, in different parts of the room, but in such positions that the direct light from it does not reach the lens. The best way to arrive at the proper exposure—or the amount of magnesium to use—will be to make a few experiments in the room the night before the group has to be taken. We do not think "Professional" will be successful if he uses an aperture of *f*-64 for such a job. The lens should be used with its full opening, or nearly so.

MOUNTANT, &C.—ELECTRIC says: "I shall take it as a favour if you will reply to the following queries:—1. In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897, under the head of Photographic Mountants, it is stated that starch, treated under certain conditions with aqueous alkali, forms a paste having strong adhesive properties. Can you give me any information as to the conditions required? I have made several experiments, but so far without success. A paste such as that described would be very useful to me, though not as a photographic mountant. 2. In THE BRITISH JOURNAL OF PHOTOGRAPHY for October 16, 1896, a correspondent calls the attention of photographers to a new gold paint (the Electric), and gives an address in Bristol where it may be obtained. I wrote two weeks ago for a sample, enclosing stamps for same, but have not received any reply of any kind, although I said I would send more money if that sent was not enough. Can you or your correspondent give me any information in reference to this matter?"—1. We know nothing more than what the author mentions, but we may say that the details of the manufacture of these commercial cements are treated by their makers as trade secrets. As the one in question is not suited to photographic purposes, we have paid no heed to it beyond quoting from the author. 2. We know nothing of the firm mentioned. Better write again; possibly your letter miscarried.

FAULTY EMULSION.—E. L. J. writes as follows: "Kindly give me information upon the following:—I want to make some enlarged negatives from carbon transparencies; I have tried dry plates up to 26×22, but they are not satisfactory. The sizes I wish to go to are 30×24. As an old wet-plate worker, I should like to use this only in a modified form, because the gallons of silver solution I should want, and the trouble of keeping the bath in order would be great, so I tried Mr. Banks's formulæ on pages 660, 661 of the ALMANAC for 1894, and pages 630, 631 of ALMANAC for 1892. I have three quarts of the former emulsion made up, but I cannot get a very good result, the plates seem very fogged; in fact, I developed two small sizes without having been in any way exposed, and they blacken on the application of developer (ordinary wet-plate one). Kindly state if this is a satisfactory emulsion for the class of work I wish to do. I have tried various formulæ of Abney's, *ex* his book *Photography, with emulsions*, but find they are so excessively slow, which makes them prohibitive for enlarged negatives, as I work by daylight which is not over good. Ordinary rapid bromide paper, taking quarter of an hour for a 25×21 enlargement from whole-plate using Ross Goerz twelve-inch lens, stop *f*-11."—Evidently the emulsion our correspondent has made is faulty, and unsuitable for his purpose. We should advise E. L. J., as he is an old wet-plate-worker, to adopt that process. If the plates are sensitised in a flat tray, a gallon and a half to two gallons will be ample solution for plates of the size named.

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EX CATHEDRÂ.

The interesting and instructive remarks made by Captain Abney at the conclusion of Sir H. T. Wood's paper on Chassagne's colour photographs at the Society of Arts, on February 24, will be found in another part of the Journal. Our leading article this week is also devoted to a criticism of M. Chassagne's results that were subsequently placed on view in the Society's room. On the occasion referred to, some of Mr. J. W. Bennetto's coloured transparencies were also projected on to the lantern screen, but, greatly to our and every one's surprise, they formed no part of the Exhibition of colour photographs that was afterwards held for three days. It is now about eight months since the announcement of Mr. Bennetto's "discovery" was publicly made. There appear to have been several lantern-slide exhibitions of his results, but so far, to quote his own words (see page 143), "no colour pictures have EVER left my hands for ANY purpose whatsoever." Is it not time they did?

* * *

The Institute of Photographic Artists, of 61 and 62, Chancery-lane, W.C., is not dead; neither does it sleep. A circular, dated January, 1897, and signed by Mr. Luwee Harris, Secretary, has been issued to professional photographers; so, of course, several copies have been sent to us. We may remark that our collection of Mr. Luwee Harris's literary productions is getting extensive. This circular encloses a membership application form, and says that applications for membership should be accompanied by specimens of work or references. Members, we are told, are classified as Fellows or Associates, according to their professional qualifications.

* * *

We do not know how the members of recognised and established societies of artists, from the Academy downwards, will relish Mr. Luwee Harris's statement that the Institute was formed with a desire to remedy the present unsatisfactory state of the profession of photographic artists, and to endeavour to secure for such the *same unity, co-operation, and mutual protection which has been obtained by oil and water-colour painters and other artists* by their respective societies and institutes. The italics are ours. Possibly, however, the painters here referred to are those that paint houses, not pictures? Mr. Harris might explain.

* * *

The next paragraph discloses most laudable sentiments, but its reference to the "new photography" makes us smile:—

"Hitherto the artist in photography has not received the attention which the importance of his calling demands, but the skill which this profession entails, not to mention the phenomenal development of what is popularly known as the 'new photography,' renders it necessary that some means should exist whereby the artist and the public are alike protected from those unqualified gentlemen who, it is well known, claim to be conversant with the technique of the profession."

We agree that photographers and the public require to be protected from "unqualified gentlemen," and we cherish the belief that our readers always appreciate our endeavours to put them on their guard in this respect. We feel it to be our duty to state again that the Institute of Photographic Artists and the names of its promoters are unknown to us.

* * *

Messrs. Moult Bros., of 176, Wardour-street, Oxford-street, W., send us a sample of a new certificate of identification, of which they are sole licensees for the preparation, supply,

and sale. This is designed for the use of travellers and others who find it desirable to carry with them some means whereby they can prove their identity. It consists of a two fold leaflet, having on the first page a solicitor's certificate of the attached signatures and portrait; on the second page, the description and signature of the holder of the certificate; on the third, a portrait in half-tone, with the signed declarations of the original and a solicitor. Besides arranging for the supply of these certificates, Messrs. Moult also undertake to procure passports, certificates of birth, &c.

* * *

In reference to the following somewhat amusing but entirely creditable letter from a young soldier on foreign service who is anxious to take up photography, Mr. J. Lillie Mitchell, the General Manager of the London Stereoscopic Co., writes us :—

"It has been said that the army are not much interested in photography, but I think the enclosed is almost good enough for publication. In any case it is worth your while to glance over it. It is about as original an application as we have had for some time."

* * *

We reproduce the letter, which is interesting as showing the difficulties the young soldier at a distance has to meet in taking up photography; moreover, it breathes a spirit which justifies one in looking for Tommy Atkins's future success in the black art :—

"I have taken the pleasure of adressing you theses few lines hoping when it reshes you it may find you in good state of health as it leave me at presant. Dear Sir I have great cowse to write you about Photographing work I am a young hand abowt it infact I donot comince has yet. I am only studering at presant, I showld like to get all the Imformation from you that you can give me. Sir I have insort the matter from last June and I com to find it is a very good methow for young to learn I have had the pleasure of seen a book of the London Stereoscopic Company and I have great Pleasure in reading it. It also recomends me to you that I may get all information from you Sir. My Opionion as I have seen in your catalogue and price list to all and catalogue sent free. Sir I send to ask you as I am one of those who are a biginner and would like to goin for the busness Please to send me a A. B. C. of Photographic instruction. The book what I speak about it was lended to me by my company Sergent Magor, I should like to know from you if self instructions are enough to make me a compleat Photographer if so Please acquante me in your sending Nothing more to say at the presant."

A CRITICISM OF M. CHASSAGNE'S COLOUR PHOTOGRAPHS.

Although the rationale of the process by which they are produced has not yet been disclosed, ample opportunity has arisen for a careful examination of the results yielded by M. Chassagne's method of producing photographs in colours, which has recently excited considerable interest in this country. Following Sir Henry Trueman Wood's paper on the subject that was read at the Society of Arts on February 24, there was a three days' Exhibition in the library of the Society of a considerable number of transparencies and prints, specially prepared by M. Chassagne, and we took occasion to subject them to a close scrutiny by daylight.

The admiration excited by Mr. Bennetto's coloured transparencies that were shown on the screen at the meeting referr to has led some persons to institute comparisons between h productions and those of M. Chassagne, to the disadvanta of the latter. The comparison is unfair, as it must be obvio that the distribution of colour upon a transparent materi gives rise, whether the images be viewed by transmitted lig or by that obtained with magnified projection, to a purity an brilliancy of deposit necessarily not observable when the pictu is mounted upon an opaque support. There is, in fact, all th difference, if we may so express it, between a positive print o paper and a lantern slide, and therefore comparisons are hardl admissible.

We have not the smallest doubt that, if M. Chassagne ha so far confined himself to the preparation of lantern trans parencies by his method, they would have elicited plenty o gratifying if valueless admiration, but he has had the acutenes and the wisdom to recognise that his process must stand or fa by its qualities as a means of producing colour photographs o paper. We gravely doubt if, after what has been done by M Ives with the three-colour process on glass, any appreciabl room for qualitative improvement exists in this direction; and whether this is or is not so, any colour process which relie exclusively for its success as a means of producing prettil coloured pictures for the magic lantern need not be take seriously into account in connexion with the solution of th natural-colour photograph problem.

We must frankly say that M. Chassagne's results do not admirable though they undoubtedly are, cause us to alter th opinion we formed a month ago, viz., that the colours are, i general, weak and unsatisfactory. In some large landscapes of different subjects, the skies had a uniform steely-grey tint which did not suggest nature; on the other hand, the bright green foliage of the pictures may have been truthfully re produced. A curious characteristic of the several portraits shown was that the flesh tint, which resembled the flesh colouring of the old "club" portraits, was identically the same, whether the original was an old man, a lady, or a child It is not usually so in nature, we think.

The foregoing remarks apply to both prints and trans parencies; but it was instructive to pit the print against th transparency, the subject being the same in both cases. I the latter case, as might have been expected, the transparency of the colours conduced to a far more effective rendering of th total result, although there appeared to be little practical gai as regards individual colours.

One or two specimens seemed to suggest, in such cases wher fine details were outlined against the sky, &c., that the selectiv colour absorption principle breaks down when it is required t be minutely exercised, the colours apparently "running," s that, in looking through the small openings on the top of a house it was not the tint of the sky that was seen, but the colour o the tilework.

Especially interesting was a series of four prints in various colour stages of colour: (1) monochrome; (2) treated with the blue solution; (3) blue + green; (4) blue + green + red. It struck us that some considerable skill and judgment would be required in applying the solutions in order to avoid "blocking up" of the colours, the red solution in one case quite over-loading the face of a portrait and destroying the likeness. Some of the prints showed water and sky to be alike in depth and colour, a manifest incongruity; and, speaking generally, foliage is rendered too dark and green, though the less pronounced tints are more satisfactory, and where bright yellow,

s of jewellery or buttons, appears, the results were realistic o a degree.

On the whole, interesting and excellent though the pictures ıay be, and novel and simple though the process is, these oloured photographs leave a great deal to be desired. We see ıo reason to depart from the opinion we expressed a month ago hat the results are far from satisfactory; but we sincerely ope that the process is capable of improvement, and that I. Chassagne may meet with the success he deserves.

Prizes for Photo-Astronomy.—The Belgian Government as offered 300,000 francs in prizes, open to individuals of any ationality, on the occasion of the Exhibition to be held this year in ;russels, to the authors of the best solutions of certain astronomical roblems. The one chiefly interesting photographers is to "invent means by which planetary details may be photographed as clearly s they can be observed." Those who have followed eclipse ork, and noted its requirements, may like to be informed of nother of the problems—"Find a method by which the sun can be bserved at any time as if it were totally eclipsed."

Haze.—This important topic had considerable practical light hrown upon it by the Hon. Rollo Russell in a paper read before he last meeting of the Royal Meteorological Society. As a prac- cal rule, he gives from noon to three o'clock as the best time for a lear atmosphere. The clearest winds are those from south to north- est inclusive, and especially west-south-west, west, and west-north- est; the haziest are those between north and east. "At any dis- ance within a hundred miles from London or the Black Country bservations requiring clear views" (photography naturally being ıcluded in this range) "are likely to be interfered with when the ind blows from their direction, and should therefore be taken arly."

Museums of Science and Art Department.—Com- laints are frequently heard as to the above, and on Friday last, on he motion of Sir W. Walrond in the House of Commons, a select ommittee was appointed to inquire into and report upon the ad- inistration and cost of the museums of the Science and Art De- artment. The Committee is to have power to send for persons, apers, and records, so that it will be able to make the inquiry very omplete, and it is hoped that it will, so that there will be no cause or future grumblings. Amongst the Committee, which consists of fteen—five to form a quorum—are Mr. Acland, Lord Balcarres, ir J. Gorst, Dr. Farquharson, and other well-known names.

Mechanical Flight.—The description we recently gave of ite-flying extraordinary which could be photographically utilised ndicates actual possibilities; but, if Professor Langley's anticipations rove to be well founded, any practical aërial machine would at once, f course, put kites in the background for high elevation for photo- raphy. Professor Langley's aërodrome is the outcome of the study nd resulting improvements of the problem of aërial flight as hown by the instrument he made in 1894. He considers himself ıstified, he states, in announcing that mechanical flight has now een attained. On the sixth of last May the Professor's piece of ıechanism, built chiefly of steel, and driven by a steam engine, ıade two flights of over half a mile, and since that time he has, he tates, doubled these results.

Röntgen Ray Photography for Medical Diagnosis. —A well-known photographer, who has taken up Röntgen ray work rofessionally, informs us that he was recently applied to to photo- raph a lady who was suffering from urinary calculus in order to nable her medical man to decide whether it was worth her while to e operated upon for lithotomy. He considered that such a sciograph ras not feasible. We find in a recent publication—the first issue of he *Middlesex Hospital Journal*—a paper dealing with this particular subject. The writer, Mr. Henry Morris, says, with regard to the diagnosis of renal vesical calculi, that calculi composed of uric acid and urates are not likely to be revealed by the rays, especially if they have to pass through the skeleton to reach them. On the other hand, stones which have phosphates or oxalate of lime in their com- position can be discovered by the Röntgen rays.

Novel Illustrations.—The use of the stereoscope and stereo- scopic views has, for the most part, been restricted to such subjects as amuse—portraits, views, &c.—rather than those of scientific interest; but on the Continent they are being made use of in quite a different way. The *Rivista Scientifico Industriale*, in the first number of its new volume, devotes a considerable portion of its pages to a bibliography of Italian investigations upon the Röntgen rays, and, what is more to the purpose of this paragraph, it illustrates a paper dealing with optical matters by stereoscopic views of an optical kind for interference experiments. No one who is at all familiar with the usual process block representing interiors of, or special pieces of apparatus in connexion with, scientific workshops, but has been struck with the very imperfect idea they give of the originals; but it is quite evident that, if stereoscopic views were to be made to replace this style of illustration, their usefulness would be beyond cavil; they would apparently bring the actual thing itself before the spectator.

A New Crusade.—It is reported that Mr. Moody, the sen- sational preacher in America, has opened a fierce crusade against the nude in art. The other day, when preaching in New York, it is said he called upon his congregation to tear from their frames any pictures of the nude they may have in their houses, and make a bonfire of them in the street. The preacher did not stop at that, but advised that the same treatment should be adopted with all the paintings of the same kind in the public art galleries. It is tolerably well known in the picture trade that, for years past, wealthy Americans have been buying freely, in the English as well as in the Continental markets, works by the old masters, and have given almost fabulous sums for good examples. Very many of these pictures include the nude, and it will be interesting to see what effect Mr. Moody's preaching will have on their owners, who have paid enormous prices to obtain them. Will they tear them out of their frames, and use them for bonfires? What say the trustees to the public art galleries to such nonsense as this?

Forged Bank Notes.—It appears that, within the last week or two, between thirty and forty forged 20*l.* notes have been presented at the Bank of England for payment. The Bank authorities consider these to be the most successful forgeries that have been perpetrated during the past five-and-twenty years. It is said that these fictitious notes had all been cashed at foreign banks, principally at Vienna, and sent over here in the ordinary course. This shows that they must be very good imitations indeed. It will be interesting to know if photography played any part in these forgeries. It has done so in some former cases, and we strongly suspect it may have done so in the present. It is stated that the water mark is impressed after the paper is made, whereas, in the genuine Bank of England note, it is produced in the manufacture of the paper.

It will be remembered that the late Mr. W. B. Woodbury introduced a method of water-marking paper by rolling it with heavy pressure in contact with Woodbury gelatine relief, and so successful were the results that it required an expert to tell that the marking was not produced in the making. This kind of water- marking, however, becomes greatly modified if the paper is wetted, while the other does not. Photogravure, as well as the photo-relief block process, if skilfully worked, would seem to lend themselves very well to the bank-note forger. But the thing is not so easy, owing, chiefly to the simplicity of the design of the Bank of England note and the paper upon which it is printed. We believe the Bank authorities rely more upon their paper than they do on the printed matter.

Discriminating Colour Absorption.—The idea of discriminating colour absorption is not altogether new. Some few years ago a patent was taken out in this country for producing photo-lithographs in colour based upon this idea. Speaking from memory, the method as described in the specification was this: A negative is taken in the ordinary manner in the camera. From this three, or more, positives are then printed on specially prepared papers, one for each colour, the principal thing in these specially prepared papers being bichromate of potash or gelatine. It was alleged, in the specification of the patent, that each kind of paper was capable of taking from the negative only so much of it as contained the colour for which it was specially prepared. For example, that prepared for yellow would only be affected by what was yellow in the original, and that prepared for red only by what was red, &c. These printed impressions were then to be inked up with lithographic transfer ink, and transferred to different stones to be printed from after the manner of ordinary chromo-lithography. In this specification it is alleged, although the negative was only of the ordinary kind, that these "specially prepared papers" were only influenced by such colours of the original as they were prepared for, *i.e.*, the coating of the paper rendered more or less non-absorbent of water, and repellent of the fatty transfer ink. In a sense, it will be seen that the discriminating absorption idea is not altogether new. It may be mentioned that this process, as might be imagined, was not worked commercially, though, we believe, considerable expense was gone to for the purpose of doing so by those who found the money.

DIGRESSIONS.

No. XV.—150,000 Celebrities.

A famous American photographic portraitist died in November last, and obituary notices of him have appeared in many of the papers devoted to the art. Napoleon Sarony has been a prominent figure in photography for nearly forty years, and I made his personal acquaintance about 1859, when he had a studio in New-street, Birmingham. This period, by the way, is curiously given to "travelling in Europe" in one of the notices. He was an excellent portrait photographer, a capital man of business, a painter—if not in the first class, yet certainly of very respectable accomplishments—and was younger brother to the still more famous portraitist and business man, the late Oliver Sarony, of Scarborough.

One of his greatest accomplishments was as a caricaturist. A few years ago he sent me some burlesque portraits of himself and others that I thought almost amounted to works of genius, and were one more example of the possibility of individuality in photography. His chief artistic fault was want of repose, and he carried the action of many of his ordinary portraits perilously near to the verge of caricature. One of the obituary notices gave him the credit of being "the first to introduce backgrounds in his works," a statement which will surprise many an old photographer, and may even cause some to smile. Another claim is, that "by the profession he was considered to be the leading lithographer in the world." It is certain he was a very clever draughtsman.

But the question I wish to introduce just now is suggested by another of Sarony's reputed feats. It is stated that he "photographed over 150,000 persons of celebrity, from Abraham Lincoln to Jim Corbett."

One hundred and fifty thousand celebrities! Why, the number would take the breath away from all the mere European photographers at the first blow. How many negatives does it mean? A celebrity does not get away with one negative only. It would be a very poor notability that was not worth half a dozen, and we hear of him taking some hundreds of negatives of such sitters as Sarah Bernhardt, and cannot avoid adding them up to about a million. Let us, however, consider this matter calmly, if possible.

How many sitters a day is it, to begin with?

Sarony was in business between thirty and forty years; perhaps not more than thirty within reach of celebrities, for he was in England part of the time. Let us take it at thirty, and we find that, including Sundays, high days, holidays, week days, fast days, and fourth-of-July days (excluding, however, the odd days in the lea years), it will be found to take about fourteen celebrities a day t fill the bill. Then, he had other things to do. It must have take time to become "the leading lithographer of the world," and t live up to the position. Some consideration also must be given t his ordinary sitters, the "tag, and rag, and bobtail of mankind," a Firmilian rather rudely puts it. They would take some considera tion. There would not be much graceful ease and learned leisure i such a life as this.

Then it would be proper to consider, in discussing this subject how much time should be devoted to each celebrity, and how muc to the ordinary mortal. Sarony was an elaborate poser, and mus have taken some time over his work, therefore the meanest celebrit ought to have been worth half an hour at least. Even a fifth-rat actress does not let you off in a hurry when she is "on the job," and when a Bernhardt sits to a Sarony, the battle, I have heard, last several days, and the resulting sale is enormous. But to use thre days for one sitter puts extra pressure on other days, and there mus be no stopping or flagging for thirty years. No time can be allowe to even look at a lithograph, nor to paint the pictures, for he was painter also, "shown at all the academies for many years."

Taking the question bye and large, considering all that goes to it there are not many photographers who would care to pass their live photographing American celebrities, or, indeed, the best brands o English at this pace, if they could earn an honest penny otherwise.

The most momentous question is yet to come. Where did h obtain his raw material? where did he get his celebrities? Taking into consideration that America is a great country, is very enter prising, and so forth, with possibly every individual desirous o being a celebrity, and who does his level best towards it, it is not for me to deny that it could qualify 150,000 in thirty years, especially if you include the colonels, and majors, and judges, but does it do it? We are a smaller country, and I am not sure we have the energy or aspiration in this direction of the Americans, but I do not think we could have produced even the odd 50,000 in the time, let alone the other 100,000, and these would not have been in full work, for it is not every photographer who will admit a celebrity into his place.

The question, What is a celebrity? ought not, perhaps, to be considered too curiously. It is a delicate subject. I scarcely like to ask, for instance, Is the Mayor of a small town a celebrity, and, if so, for how long? He is sometimes brushed up and revived for another year. After he has served his time, does his celebrity fade away when, like Cincinnatus, he returns to his plough, or is it a gradual process, like that of our few lord mayors who descend from lordships down to simple knighthoods, or even common councillors? Are aldermen celebrities, and the churchwardens? The beadle certainly is, although I fear even he is fallen away from reverence, so also is the mace-bearer sometimes. The extreme delicacy of the subject will be at once seen when I ask, Is our genial Editor a celebrity? or is the amiable "Cosmos"? I have never seen either o sale, although I should not like to ensure them against being sold being only mortals, after all. So also are the members of a certain council celebrated, for are they not "Royal"? There can be no doubt about the ballet girl and supernumerary, for have they not the greatest sale of all, save the bishops? Really, this question is a fearsome one, and if I am to go further, I shall wait to be endowed for research by the Convention. It relates to "persons of quality," therefore mere mortals should "fear to tread." As Dr. Syntax sings,

> "Oh, how I wish that I could sing,
> And touch the sweetly sounding string,
> In soft, harmonious praise to join,
> Of those who claim a source divine."

The curious thing is, it is not necessary to be a good man or a beautiful woman to become a celebrity. Jack Ketch is a celebrity, a unique celebrity; he is the only one who slinks out of sight as much as possible. Many photographers would rather have a sitting from him than from a common duke or marquess.

It is so difficult to persuade some men they are not celebrities, perhaps it is not worth while. Some have not the sense of Lancelot,

who claimed "no other touch of greatness except to know well he was not great." Others think that to play the fiddle for money lays all the world at their feet, and makes them so celebrated that they may claim what they will from the unfortunate photographer. I have just met with a very fine example. A celebrity with a violin gave a photographer a large order, and, when the bill was sent in, said, "Oh, I never pay photographers." It has come to that. This is worse than seeing your work cheapened by process work. I really think that the most difficult celebrities to keep within the bounds of ordinary humanity are those who go about the country playing musical instruments.

It was the photographic consideration of this subject that at first attracted me, but now I am running off after the celebrities themselves—it is meat and drink to them to be run after—instead of attending to the treatment of them.

The sale of celebrities, chiefly bishops and actresses, as *photographs*, as the produce of the mere photographer, has, I am told, fallen away, and does not carry out in the present the splendid traditions of the past, when a Marion could send to a Vernon Heath an order for 10,000 mixed royalties of a morning. The photographers of to-day have been content to allow the grand trade to slip out of their hands into those of printers and publishers, and sell their birthright—or copyright—for a few miserable ready-money half guineas, and wonder why there is so little to do in their own business. Whoever invented process was the worst enemy of the ordinary photographer.

Or is it that celebrities themselves are out of fashion just at present? I lately went the round of the shops in search of them, and was disappointed. There were what may be called the usual standard celebrities, whom we are always glad to see; but the rest seemed an inferior lot. Perhaps "not to know them argued myself unknown;' but, if there could be such a contradiction, most of the rest seemed to be unknown celebrities—the same unknown actresses, in the same want of clothes as ever. Has the process man got all the best and newest, and are they now—bishops, pugilists, princes, painters, and members of Parliament—sold on a barrow for a penny?

After all, we ought to be grateful to the celebrity of whatever quality; he has been very useful to us, we have had him with us for nearly forty years; he began as a *carte-de-visite*, passed a good deal of his existence brilliantly as a cabinet, and he is ending a useful life almost any size. We must not forget also what a time we had with the professional beauty. Humble country photographer as I have ever been, I was favoured with the countenance of one or two of them. Going through a back street the other day, I saw a print of one of them in an obscure shop window; I bought it for twopence, with a little one thrown in.

She deserved a better ending; but how Sarony found 150,000 celebrated people will compel me to pass much of the rest of my life in wonder.

H. P. Robinson.

FOREIGN NEWS AND NOTES.

Hyposulphite of Soda and Acids.—Dr. G. Aarland draws attention to a peculiar property of the acid fixing bath. Writing in the *Photographisches Archiv*, he points out that sulphuric acid may exist in the acid fixing bath without depositing sulphur from the hyposulphite. The common sulphite lye used in preparing the acid bath contains an excess of sulphurous acid, and amongst other impurities free sulphuric acid. The bath, however, remains perfectly clear, and there is no deposit of sulphur, as is the case when even minute quantities of sulphuric acid are added to a solution of hyposulphite of soda. An acid fixing bath that had stood some time, and was free from the odour of sulphurous acid, did not deposit any sulphur upon the addition of a considerable quantity of dilute sulphuric acid (one in five). Dr. Aarland brought these facts under the notice of Dr. Ostwald of Leipzic, who remarked that few chemists were aware that free acids, sulphuric especially, might be present with hyposulphite of soda without causing decomposition. If sulphurous acid or a solution of bisulphite of soda be added to a solution of hyposulphite of soda, sulphuric or hydrochloric acid may be introduced without fear of decomposition.

Copying Prints, Drawings, &c.—The following hint from *Die Photographie* may be found of use where torn or folded printed matter has to be copied, and mounting and rolling is inadmissible. A sheet of glass or metal is given a somewhat thick coat of gelatine, and before use it is brushed over with water and glycerine in equal parts. The superfluous moisture is removed with blotting-paper. The prints are slightly moistened on the back, and pressed into contact with the coating of gelatine by means of a roller or the palm of the hand. After the photograph has been made, the prints can easily be stripped from the support, and the coated plate may be reserved for use on subsequent occasions.

Light in Winter.—Dr. H. W. Vogel gives the following interesting results of some experiments made last month in Berlin, to ascertain the intensity of the light on certain days. The measurements were made in a photographic laboratory that had been used for years for photometric work, and they were carried out at four and a half metres from a window of five square metres area. The Hefner candle unit is equal to 1·1 of the English standard candle.

Date.		Hour.	Light Intensity.
Jan. 13 ..	Thick fog, grey sky ..	3 p.m. ..	2·31 Hefner candles.
„ 14 ..	Little fog, snow	2 „ ..	79·6 „ „
„ 15 ..	Grey sky, somewhat clear	2 „ ..	89·5 „ „
„ 16 ..	Grey sky, little fog ..	2 „ ..	55·54 „ „
„ 22 ..	Bright, sun visible through mist	2·30 „ ..	394·5 „ „

As a remedy for dark days, Vogel recommends the use of electric light in the studio and developable papers for printing. The latter have not received all the attention they deserve.

The X Rays and the Blind.—The statements circulated concerning Edison's alleged discovery of the means to enable the blind to see form the basis of an article by Dr. Paul Czermak in the *Photographisches Archiv*. The X rays are generally described as invisible, although some persons have been found whose eyes are sensitive to them. This is notably the case with persons who have had the lens removed from the eye for cataract. The lens is said to be fluorescent, and therefore absorbs the rays. When it is removed, the rays penetrate to the retina, and excite sensation; but, if an object has the X rays projected upon it, some pass through, and some are absorbed, but none are reflected. No experiments hitherto made have shown that it is possible to reflect the rays to any important extent, and only metals have shown traces of a weak diffused reflection. Another condition necessary to vision is, that the light reflected by the object shall be capable of refraction. The X rays have, as yet, been found irrefrangible, or nearly so. Only traces of refraction have been observed in their path through metals; but there is one piece of apparatus that will give an image without the use of a lens, the pinhole camera. This has been used for the X rays, for which purpose it is made of lead, and the pinhole is protected from ordinary light with a black paper or aluminium shutter. An eye sensitive to the X rays must act similarly to a pinhole camera. With such a camera Dr. Czermak has obtained photographs of a small steel plate placed very close to a Röntgen tube, and it would therefore have been possible for a Röntgen eye to see it. Hence he concludes that, if there are persons whose eyes are sensitive to the X rays, they could, with similar pinhole camera spectacles, see indistinct images of a Röntgen tube, and, very faintly, metal objects in its vicinity. This would also be true of the blind, if the optic nerve is intact and the retina is sensitive to the X rays, which is not yet positively established. If Edison, by similar means, aims at helping suffering humanity, the practical effect is of very problematic value for the blind.

Reddish Tones for Positives.—The following formula is given in the *Wiener Photographische Blätter*:—

Solution I.

Yellow prussiate of potash	0·5 grammes.
Water	200 c.c.

Solution II.

Nitrate of uranium	2 grammes.
Sulphocyanide of ammonium	10 „
Acetic acid	2 „
Water	200 c.c.

Immediately before use, mix equal quantities of Nos. I. and II., and immerse in it the positive, previously well washed, until the

desired colour is attained. If the high lights are veiled, they may be cleared with a weak solution of carbonate of soda, 1 in 500.

Acetylene.—The authorities in Berlin, where four persons were recently killed by an explosion of liquid acetylene, have issued regulations making it a punishable offence to generate acetylene gas without previous notice to the police and approval of the apparatus. The pressure must not exceed one and one-tenth atmospheres. Government institutions are exempt. The manufacture of fluid acetylene is placed under the same regulations as explosives, and the Head of the Police has issued a notice that its explosive power approaches that of gun-cotton. Explosion may be caused by incandescent wire, local heating, concussion, and too rapidly opening the holder. The importation of fluid acetylene is also placed under the same regulations as explosives.

CLEAN GLASS.

Every wet-plate worker is fully alive to the extreme importance of starting with a perfectly clean glass surface to support his film, but I am afraid the same attention is not paid to this detail by those who are in the habit of using collodion emulsion for lantern slides or stereo transparencies. In the case of wet plates, carelessness in the matter of cleaning the glass is immediately fatal to success, and consequently the user of the bath is compelled to keep up to the mark in his cleaning operations. Not so, however, with dry films and alkaline development, for a plate that is apparently clean will often, or, in fact, as a rule, give a fairly satisfactory result, although, if used for wet collodion, it would break down completely.

So far is this the case, that it has been the belief of collodion-emulsion workers for many years past that, if silver intensification is not to be used, comparatively little care need be given to the preparation of the glass provided it be free from visible impurities; but, when pyro and silver intensification is the rule, more attention has to be given to this point, though, perhaps, not so much as would be requisite if the bath were used, since the conditions of acid silver intensification are identical with those of ordinary wet-plate development. Alkaline pyro acts simply on the silver salts on the film, and has been supposed to possess practically no power to render visible any previously invisible stains upon the surface of the glass; but, when the pyro is employed for the purpose of depositing silver upon the film, or the exposed portion of it, as is the case in wet-plate development or silver intensification, the reduced silver is attracted with quite as much avidity by any impurities on the glass as by the molecules of exposed silver haloid. Then it happens that any smears or polishing marks are faithfully reproduced, and with a vigour that appears altogether in excess of the legitimate image; while it used to be a by no means uncommon occurrence to find an old image redeveloped, owing to its having been imperfectly, although apparently, removed in the cleaning operation.

Gelatine workers are saved these troubles, because they employ only alkaline development and films that are coated upon new glass, which, for the purpose to which it is applied, requires comparatively little care in cleaning; but, those who employ collodion emulsion are not so favourably placed unless they follow the unpardonably wasteful practice of never using a plate a second time. Here the collodion and gelatine worker are placed in quite different positions. The latter, in the first place, does not prepare his own plates, and, if he did, would nowadays probably find it cheaper to buy new glass than to devote the time and trouble necessary to the removal of old films and the preparation of a sufficiently clean surface for recoating. But collodion films are so easily removed that, even with glass as cheap as it is at the present day, it would be wilful waste to reject a plate that had been once used. In the old days, when ordinary glass plates uncleaned cost as much as, or perhaps more than, gelatine plates ready for exposure do now, and when specially thin glass for lantern slides and stereoscopic transparencies cost as much as two shillings and ninepence and six shillings a dozen respectively, there was every inducement to practice economy; and even now, when glass is so much cheaper, I imagine few amateurs, however wealthy, will be above devoting the small amount of trouble that is required in cleaning off spoilt films in order to use the glass again.

But, where this is done, it should be done properly. But, first of all, we must get rid of the idea that any sort of cleaning will do for collodion emulsion, so long as the glass is apparently clean and evenly polished, when the old test of breathing on it is applied. Such a plate may be, and very frequently is, utterly unfit for use when silver intensification has to be applied; but it will probably be new to many, even old emulsion workers, that it may be equally unfit for simple alkaline development.

I have before me as I write a negative that forms an admirable object-lesson in point. It is a copy of an engraving made with washed emulsion, and developed to full intensity with alkaline pyro, no silver having been used; but, before coating with emulsion, one-half of the plate was coated with a substratum of dilute albumen. When examined by transmitted light, there is nothing very noticeable so far as difference in cleaning is concerned—nothing, at any rate, that would make any difference in printing; nor, on examining the film side, can any difference be detected until special attention is directed to it; but, on examining the back of the glass, one portion of it, that which is coated with albumen, shows up bright and clear as a positive, while the uncoated portion is dull and veiled, and, on closer scrutiny, shows distinctly the marks of the polisher.

Now, the point is this, the glass so treated was fairly well cleaned, as ordinary cleaning goes; so far so, that a plate, similarly cleaned and treated, was intensified with silver instead of carrying the action of the alkali as far; and this did not exhibit very much more veil, though it certainly was more appreciable, and would have gone on increasing as the intensification was pushed. But the result entirely disposes of the idea that alkaline development produces no result upon dirty glass. I have said that the difference between the two halves was not such as would show in printing, but it must be borne in mind that, neither with alkali nor with silver, was the development or intensification pushed in any way. They were simply carried about as far in either case as would be required for an ordinary lantern slide or a negative for printing on modern emulsion paper. But, if carried as far as would be required for a process negative, the result would most probably have been an amount of fog in the clear lines that would have rendered the negative useless, and fog, moreover, of the worst sort, since it would be between the film and the glass, and beyond the practical reach of a clearing solution.

I must admit that I was quite unaware that such a result could be produced until I was called to help a friend out of trouble. He was somewhat of a novice in photography, and entirely new to collodion emulsion, with which, however, he was getting along fairly well, except that his slides were invariably more or less veiled in the high lights, and sometimes absolutely fogged beyond all decency, although the same emulsion in my hands worked perfectly clean and bright. So one day I went down to his place to investigate matters, and ended in making a discovery.

For cleaning purposes, whether new or old glass, the first treatment was to scrub with a piece of flannel and Brookes's soap, which I had recommended, followed by a good rinse in clean water, and the glass was then thoroughly dried and polished with powdered talc. So far, so good; the treatment is all right when properly performed; but, when I found my young friend in the act of scouring a plate with a black mixture composed of Brookes's soap and an old film in an extremely fine state of division, I began to suspect that finely divided silver was, perhaps, not the best thing in the world to rub into the surface of a plate that had to be used for lantern-slide purposes. I found that the flannel used seldom enjoyed the luxury of a thorough "wring out," the only cleansing it got was when it was momentarily held under the tap before applying it to the bar of soap, which, in turn, was sometimes fairly clean, but generally nearly black, so no wonder there were foggy plates.

A thorough cleaning of both flannel and soap block produced a great improvement, but still there remained a slight veil, which, when closely examined, showed distinctly the polishing marks. A fresh and quite clean polishing cloth, a clean cambric handkerchief, was then tried, but without any apparent improvement; so the French chalk was dispensed with, and this brought a complete cure, part of the veil arising from the use of a very impure sample of talc. This is a point that few workers give sufficient attention to, while others, I am aware, taboo the use of talc entirely on account of its dirtiness; but, if before use the talc be submitted to a simple cleansing process, its undoubted advantages are secured without the least danger of dirty plates.

Take a quantity of the talc—say, half a pound, which will last a very long time for polishing purposes—and beat it into a paste with a little water, and, when thoroughly wetted, gradually add more until it is of the consistency of thin cream. Then transfer it to an enamelled iron pan or porcelain basin, throw in a handful of soda crystals, and boil for a few minutes; then add more water, and wash repeatedly by decantation until no trace of alkali remains. I sometimes have given a second treatment with dilute nitric acid, but the soda seems quite sufficient. When thoroughly washed, ladle it into a soup plate, and put it into the kitchen

oven to dry, when it is easily rubbed through the fingers into its original pulverulent condition.

While advocating thoroughly efficient plate-cleaning, I am far from advising the vigorous treatment adopted by some of soaking the glass in nitric acid for twenty-four hours, and such like extreme measures. If the plate be scoured with a *clean* rag and *clean* Brookes's soap, or other similar detergent, dried and polished with cloths that are also clean, and with purified talc, there will not be the slightest vestige of danger of fog or veil. This is my method of working when experimenting, for I have not the time to albumenise or gelatinise each plate, and sometimes the same glass has three or four images developed on it in the course of an hour, it is *so* easy to clean off a collodion film while it is still wet; but it is only in cases of palpably insufficient washing between operations that I ever get any veiled shadows, even when two or three silver intensifications follow one another.

But for any one working for the production of negatives—that is, for practical results that must be secured with certainty, and with the least possible trouble—I should always advise the use of a substratum either of albumen or gelatine. The former is preferred by many, though I think gelatine is better, as it is not liable to loosen its hold between film and glass from the solvent action of the alkali in the developer.

W. B. Bolton.

CHASSAGNE'S COLOUR PROCESS: CAPTAIN ABNEY'S OPINION.

At the conclusion of Sir H. Trueman Wood's paper on the Reproduction of Colour by Photographic Methods, read at the Society of Arts on February 24, and an abstract of which we gave last week, the Chairman of the meeting (Captain Abney) remarked: "Very many remarkable experiments had been made with chloride of silver, not only by the ordinary photographic printing process, but in investigating it in what he might call a more brutal way, giving it plenty of exposure so as to get the germs of the chloride pigments which, no doubt, existed. He had always held, and still held, that there would be no photography in natural colours until they were produced by light as pigments. Lippmann's photographs were not really photographs in natural colours, because they were only visible at one angle, or approximately so; a photograph in natural colours must be one in pigments. The question was, Had those pigments been produced? And the answer was that they had, many years ago, almost at the dawn of photography, when Becquerel produced his photographs on chlorinised silver plates. A paper had been alluded to by Otto Wiener, in which it was said that these were not pigment colours, and, of course, they were not entirely so, some were produced by interference, the same as Lippmann's; but, when you could get on a sheet of glass the colours you got by Becquerel's process, and you had the same colours by transmitted and by reflected light, a large proportion at least of the colours must be pigment and not due to interference. It was not quite correct, therefore, to say that photographs in natural colours had never been produced; the great crux was, Could those natural colours be rendered permanent by fixing? If any one had discovered a method by which the photographs produced by Becquerel could have been rendered permanent, photography in natural colours would have been a commercial fact long ago. Niépce produced not only photographs of the spectrum (which was quite easy with sunlight, in two minutes you could produce one as brilliant as the one shown on the screen), but Niépce and St. Victor produced a number of photographs, which were sent to London by his widow after his death, and which he (the Chairman) had the opportunity of seeing—pictures of dolls of various kinds, which were all in natural colours, but would not bear exposure to daylight without fading away. Coming next to Mr. Ives, not every one in the room might be aware of his opinion of that gentleman's process. It was the acme of perfection, showing what could be done if you took the trouble to use three plates in a scientific manner. Mr. Ives was a competent experimenter and a deep thinker, and he had practically applied scientific theory. One of the lessons which ought to be taken to heart was that, although the scientific man with his theories might be scoffed at for a time, eventually some one, like Mr. Ives, came forward and showed how theory could be applied to practical work. Another process referred to was that of Professor Joly, which was a very remarkable one indeed, and was practically founded on the fact that the eye was unable to distinguish two colours when they were separated by a very small interval, so that, when two dots or lines, red and green, were very close together, they appeared as one dot or line of yellow. He had had the pleasure of seeing those photographs at the Royal Society and elsewhere, and, although they were not then perfect, they had, no doubt, since been improved. He thought the process had the germs of success in the future. With regard to the Chassagne process, it had been truly said by Sir Henry Wood that an inventor who kept his method secret had to prove his case up to the hilt. He had been fortunate enough to see the process, and certainly everything he saw was above board, there was no 'faking' of any kind. What was to be seen was perfectly true, what was done was perfectly effective, and the colours in an object were reproduced in the print. How they were reproduced he could not say. They had yet to know whether the negative was responsible for the colours or whether it was the print alone. Whether it was a happy accident to make those particular dyes take on particular parts of the photo or not, had still to be learned; but, whatever the reason, the fact remained that the colours were produced in proper order and in the proper places on the print, and without any brush manipulation, because one saw a brown and white print manipulated in a very free-and-easy way, and, wherever the blue ought to be, there the blue was, and the same with green, flesh tints, and all the other colours. Whether it was going to be a commercial success he did not know or care; what he wanted to know was, how these things happened, and he hoped before long they would have the opportunity of further investigation, and of finding out how much depended on the negative, and how much on the printing."

PHOTOGRAPHIC EXPORTS.

Compiled from the Customs' Entries.

January, 1897.

	£		£		£
Adelaide	96	Brought forward	3863	Brought forward	6554
Alexandria	47	Flushing	275	Otago	138
Amoy	13	Fremantle	135	Penang	38
Amsterdam	200	Ghent	353	Port Elizabeth	129
Auckland	396	Gibraltar	5	Rangoon	21
Bangkok	54	Gothenburg	10	Rosario	8
Bombay	1064	Hamburg	68	Salonica	13
Boulogne	99	Hiogo	72	Shanghai	100
Bremen	33	Hobart	20	Singapore	162
Brisbane	185	Hong Kong	112	Sourabaya	8
Buenos Ayres	226	Kurrachee	48	Sydney	536
Calcutta	309	Lisbon	32	Teneriffe	290
Capetown	333	Madras	116	Tokio	309
Christchurch	82	Malta	20	Trinidad	18
Christiania	104	Manilla	15	Wellington	423
Colombo	41	Melbourne	1365	Yokohama	166
Durban	378	Mersyne	9		
East London	193	Napier	46	Total	8913
Carried forward	3853	Carried forward	6554		

January, 1896.

	£		£		£
		Brought forward	3629	Brought forward	5334
Adelaide	259	East London	225	Malta	26
Alexandria	17	Flushing	248	Manilla	24
Algoa Bay	275	Foochow	10	Melbourne	3420
Amsterdam	21	Fremantle	16	Mergoyne	30
Auckland	256	Hamburg	116	Ostend	12
Bilbao	17	Hiogo	322	Otago	360
Bombay	1450	Hobart	10	Penang	34
Boulogne	203	Hong Kong	42	Natal	24
Brisbane	108	Jamaica	42	Rangoon	59
Calcutta	278	Jaffa	15	Reval	126
Canterbury	31	King Geo. Sound	114	Shanghai	351
Capetown	231	Kurrachee	31	Singapore	69
Charters Towers	40	Le Treport	40	Sydney	839
Christchurch	82	Lisbon	96	Sourabaya	12
Christiania	43	Lyttleton	99	Tokio	579
Colombo	224	Madras	274	Townsville	16
Delagoa Bay	94	Malaga	5	Victoria	54
Carried forward	3629	Carried forward	5334	Wellington	313
				Yokohama	150
				Total	11,832

February, 1897.

	£		£
Adelaide	151	Brought forward	3999
Alexandria	167	Las Palmas	14
Auckland	130	Launceston	9
Beyrout	11	Lyttleton	48
Bombay	701	Madras	134
Boulogne	182	Malta	15
Brisbane	7	Marseilles	110
Buenos Ayres	265	Melbourne	583
Calcutta	308	Mombasa	31
Capetown	367	Ostend	34
Christchurch	260	Penang	121
Colombo	163	Perth	21
Delagoa Bay	56	Port Elizabeth	700
Durban	303	Rangoon	142
East London	124	Shanghai	491
Flushing	382	Singapore	68
Hamburg	270	Sourabaya	50
Hong Kong	10	Sydney	998
Kurrachee	142	Trinidad	12
		Manganesi	30
Carried forward	3999	Wellington	300
		Yokohama	295
		Total	8205

February, 1896.

Adelaide	£167	Brought forward	£3096	Brought forward	£4492
Algoa Bay	246	Flushing	247	Port Natal	52
Amsterdam	48	Fremantle	120	Rotterdam	20
Antwerp	44	Ghent	52	Shanghai	221
Auckland	289	Gibraltar	15	Singapore	10
Bangkok	68	Hamburg	76	Sydney	127
Bombay	813	Hiogo	96	Tientsin	78
Boulogne	280	Hong Kong	119	Tokio	24
Brisbane	20	Invercargill	35	Wellington	473
Calcutta	427	Jamaica	32	Yokohama	353
Canterbury	82	Kurrachee	37		
Capetown	255	Lisbon	25	Total	5850
Christchurch	24	Lyttleton	49		
Colombo	134	Madras	37		
Copenhagen	45	Malta	12		
Delagoa Bay	36	Melbourne	396		
Demarara	22	Odessa	11		
East London	96	Otago	37		
Carried forward	3096	Carried forward	4492		

A HINT TO PHOTOGRAPHERS.

We hear and read a good deal nowadays of the woes, in the shape of lack of work and reduced profits, of the professional photographer. Whether the all-round cheapening of things has bitten more deeply into his particular profits than into those of other trades and professions is doubtful; and, as it would give him little comfort, and less gain, to find out that it probably hasn't, perhaps it is hardly worth finding out.

Granting that profits in the regular and well-known grooves all round are now uncomfortably small, it should be remembered, at the same time, that there never has been in the country a greater amount of money in eager readiness for investment in novel and original directions; and that, if the professional photographer, in common with all other professionals, be prepared to travel along such new roads—although but paths they will prove at the start, and to the first few, probably—he, in common with the rest, will certainly gain from the opening up of new ground and fresh country.

A newer generation is rising which is looking with but scant sympathy and favour upon the majority of photographs, of so painfully uniform a type, figuring in the show-cases and windows of the photographer of to-day. Not that they lack technical skill, very many are good; some, undoubtedly, very good, from that point of view; but technical beauty and finish, though essentials, are far from being, I think, the essential essentials.

A friend presents you with a photograph of himself. What do you think of it? Good, isn't it?

Being a sensible man, and valuing your friend, you reply, with pomptitude and decision, "Yes certainly," adding, as a sop to conscience:—

"Hardly does you justice though, old man; not enough soul in it, to my way of thinking!"

"Soul," translated by *naturalness*, will about express your meaning. Where is the easy pose, leaning against the desk; the characteristic lounging in the comfortable armchair, the peculiar way of holding his pipe, we unconsciously associate with Brown, but miss in his photograph? We never saw Brown first thing Sunday morning either, consequently never in such formal immaculateness of frock coat, light trousers, and crisp tie, as are here presented. Neither have we ever seen him in the peculiar light falling upon one side of his face, nor without the little mole on the cheek, and the crow's feet at the corner of the eyes. Brown, in short, has been unnaturally posed, lighted too much in conformity with the operator's one standard, and, in addition, has had character-giving "blemishes" carefully retouched out of his face. The result is a polished billiard-ball presentment of our friend, sadly wanting in life, sparkle, and character.

The photographer, who will forget the existing traditions and rules of his trade, and take his subjects under more natural conditions, will certainly effect a grand and wholesome improvement, and make money out of it as well.

In furtherance of such a change, why not go to the house of the one to be photographed to do the work? There probably would be in most houses a room more or less suitable for the purpose, from a light point of view, in which a natural position in the accustomed chair, or at accustomed work, could, with a little skill and management, be obtained.

Some things would have to be sacrificed, which are practicable only in the studio; but not so many as imagined would soon be found after the experience of a little practical working. The light could not be so good, nor under such control, as in the studio; the portrait lens would have to give way to a long-focus rapid rectilinear, working with a comparatively small stop, whilst, as a natural consequence, a lengthened exposure would be necessary. This last would be probably the most difficult factor, but, with the extremely rapid plates now in the market, exposure need not be too long to be easily borne, especially under the more comfortable conditions than those obtaining in a strange studio.

But is the highest perfection of a photograph, naturalness, dependent upon a perfect control of light—the faithful rendering, by means of a portrait lens, of every minute detail—too faithful a rendering indeed, necessitating such a subsequent free blotting out, and correcting, at the retouching desk?

Emphatically, no. The rather does it lie in the catching of some small characteristic, a poise of the head, a half smile, a wrinkling of the brow, a thoughtful stare—one of a hundred trivial things, which the photographer cannot know of in the sitter—which indeed the sitter himself is probably unconscious of, but which he, or she, is a hundred times more likely to assume at ease, at home, than in such unaccustomed surroundings as those of a studio.

Our fathers might then be preserved to us, reading their papers, in every-day attitudes, in the familiar armchair in the corner; our mothers at ease, sewing or knitting, sisters pouring out afternoon tea—all with the suggestion of home accessories to lend added charm and pleasure to what would then become a picture.

Children it would probably be impossible to keep quiet long enough indoors, short of a well-lighted studio. But there are back gardens with swings in them, little patches of turf that are regularly raced over and played upon, instantaneous photographs in which would be practicable and have infinitely more life and individuality in them than any of the artificial-looking, wooden, staring, unchildlike productions we now get in return for our money and our infinite pains.

The scraps of art precepts that the average photographer has, and applies, are, doubtless, correct enough, and do well enough in the studio with classical faces to light and classical figures to pose. But how rare are such, and how about the very unclassical—but none the less lovable upon that account—faces and figures of the great majority of our friends and relations? There's Uncle Ben, for instance, with his podgy figure and face crammed up with wrinkles—scorings of the fates in all parts of the world throughout a life's varied wanderings. What's the use of posing him; getting an artistic, graduated light to fall slantingwise upon his face, and touching out his wrinkles? Let me have him rather as he looks tying up his beloved roses, or as he looked in the little summer-house at the bottom of the garden, when, putting his finger and thumb into his waistcoat pocket, he handed me what he took out, with the remark, "Here, Tom, I dare say you could do with a 'fiver.'"

Let some enterprising photographer make a start, then; the inevitable, initial difficulties will soon give way before a little thought, patience, and dexterous management. It can be done, it has been done, with most gratifying results, and by amateurs, lacking the higher skill of the professional.

Some time it will require, I doubt, to educate the bulk of the people beyond the highly polished studio work now in vogue, let the ordinary, commonplace, unaspiring photographer attend to them in the mean time; but there are, on the other hand, a great, and an increasing, number of educated people, with high artistic tastes, who would hail with delight the advent of a new and natural order of things, and, an important point, be prepared to pay well for original and good work.

J. Rees.

TASTE IN PHOTOGRAPHIC PRINTS.

In one of Mr. Robinson's recent "Digressions" he ridicules, not to say anathematises, the taste of the man who uses pink paper. I am extremely pleased to read at any time, and anywhere, by any person, notable or otherwise, such diatribes against a hideous and modern tendency.

In selecting tints for their printing papers, manufacturers have evidently followed the colours usually associated with the "fleshings" patronised by "ladies of the ballet," and at this season of the year so much *en evidence*. When the tints are really tints, and not loud, glaring vulgar colours, all is well; but I think of all "leggy" colours, as in photographic papers, the strong *pink* is most objectionable.

I suppose we all remember how all this came about. It was, I recollect, invariably a difficult matter to get a *white* paper which was really white and clean, and one which would keep in that condition for any reasonable time; one can only think of the stocks kept in those days by the average dealer with a shudder. The result was you sometimes bought direct, and more than you wanted. Then, I imagine, came the tinted papers, delicately tinted some of them were, mauve, pink, and blue, and occasionally a nondescript shade, which, like a "bloom de Ninon," admirably served to conceal the ravages of advancing age, being, say of a more or less dirty parchment colour. Makers were, in a sense, forced to adopt the questionable course of tinting their papers (of course, they made a virtue of it) by the depraved nature of the paper to rapidly deteriorate. The user was, to a great extent, at their mercy, for in the majority of cases he lived practically from hand to mouth.

I remember, as if it were yesterday, the first time I used pink paper. An order came in hurriedly for two dozen 15×12's of an engine we had photographed previously. Now, 15×12 is an awkward size; we had lots of paper in the place, but so unreasonable does a 15×12 cut into a sheet of paper measuring $23 \times 17\frac{1}{2}$, that we fell short of the number required. I had to get six sheets from the local dealer, and, as luck would have it, nothing was to be had but "pink." Well, the order

was urgent, and I saw nothing for it but to take this paper and make the best of it. When the prints were done and rolled, these detestable pink prints looked more glaringly pink than ever. I took the finished order with some fear and trembling to the governor; he passed eighteen prints, then gazed abstractedly at the remaining six. At length he looked me steadily in the face, and, in a voice betraying deep emotion, said: "John, I am surprised, I thought better of you." By this time my face was a deeper shade than the obnoxious print, and I remember, with a good deal of pleasure, how they were condemned to summary destruction, with a final "Let that be a warning to you!" I have used pink-tinted paper since that time, but never with anything that wanted a clear background.

Some photographers get a reputation for extremely good taste until you suddenly discover in their show-case, cheek by jowl, with some really good platinum prints, a specimen *vignette on pink paper!* Could anything possibly be worse than this, unless it be a pink and glossy bromide?

Another of high standing will show an immense variety of work, of uniformly good quality and superb technique (the thing has happened at more than one Exhibition); but is it in the best taste to print *every* class of one's work in the same, very nice, no doubt, but uniform and somewhat cold tone? Might not a little variety of colour be introduced with good effect? Infancy, youth, mid-life, and old age all uniformly coldly cold?

I once had a youthful printer, and there are others like him, who could rarely get more than six alike in tone out of a dozen portraits; this was, no doubt, distinctly unorthodox, but I don't know that I could call it so *very* reprehensible.

What a great variety of tones we can get with any good sensitive paper, the old albumenised paper or the newer chloride, by ordinary toning; also on bromide paper by the after-application of suitable solutions. Not to mention platinum with its cold or warm tones, we have a big selection of colours in the carbon process. But I doubt if so many workers realise, as they might do, the possibilities opened out to the portrait photographer at least by the use of chloride papers, *developed* and toned. Some of the colours or tones are amazingly rich, and there is no reason why we should doubt their permanence. The operations are all easy enough; the main point in my opinion is, when making the prints, to shield them from white light almost as much as one would do a very slow dry plate. The paper is faintly, but quite perceptibly, sensitive, the developing solutions must be somewhat *homœopathic* as regards *strength*, and better results are got by working in a reasonably safe, not too yellow, but certainly not white light. J. P. Nott.

RAYMOND'S IMPROVEMENTS IN THE MANUFACTURE OF GELATINISED PAPER.

M. Claude Raymond's invention has reference to the manufacture of gelatinised paper or other fabric such as is used for the reproduction by printing with fatty inks of writings, drawings, and the like.

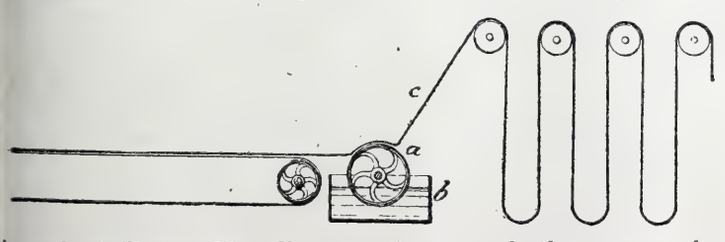
He begins by making the paper or fabric according to the usual processes, that is to say, with a solution of gelatine, water, and glycerine, The gelatine bath is heated until it is sufficiently fluid to be spread upon the paper, and this state of fluidity is maintained by heat. The paper to be coated with gelatine is caused to travel through the bath. On leaving the bath the under surface is scraped so as to leave only a trace of gelatine. The travel of the paper through the machine is continuous, and it is cooled until the gelatinous layer has become quite coagulated. It is at this part of the manufacture that his invention is applied.

The invention consists in damping the lower face of the gelatinised paper with a solution composed of a metallic salt such as sulphate of copper, iron, zinc, lead, &c., and a bichromate, or chromate, one or other of these salts, or several of them mixed (solution of two per cent.).

This damping, which can be applied mechanically or by hand, passes through the paper and enters partly into the layer of coagulated gelatine.

The ordinary apparatus can be employed with the addition of a vessel containing the solution above referred to, situated where the paper leaves the gelatinising apparatus to pass to the drying appliances. A roller, partly submerged in the solution in this vessel, revolves in contact with the lower face of the paper.

A suitable arrangement of apparatus for carrying out this part of the



invention is illustrated in a diagrammatic manner in the accompanying drawing.

In this drawing, *a* is a horizontal felt-covered roller capable of revolving with its lower portion immersed in the solution above referred to, which is contained in a vessel or trough, *b*. The roller, *a*, is driven from a suitable part of the machine, and is caused to revolve in the opposite direction to the direction of travel of the paper, *c*, which comes from the gelatinising apparatus and passes over the roller, *a*, with its lower face in contact therewith.

The solution in the trough, *b*, is kept at such a level as to continually moisten the surface of the roller, and is replenished by hand as its level falls.

The advantages claimed for this invention are:—

1. The strength of the paper or fabric is increased by rendering it nearly impermeable to water and insoluble, and by absolutely fixing the gelatine.

2. The thickness of the layer of soluble gelatine can be diminished and consequently the fineness of the transfer can be increased, and the humidity while printing can be better maintained.

3. The ink for the original writing or drawing being composed of a metallic salt such as of silver, uranium, mercury, &c., coloured with aniline, the affinity of the metals of this category and the metals (iron, copper, zinc, &c.), employed in damping the paper as above described will have the effect of forming by contact a combination, which will considerably increase the firmness and penetration of the transfer.

The claim is:—

The application to the lower surface of a paper, or other fabric, which has been gelatinised of a suitable solution of one or more metallic salts, with or without a bichromate or chromate.

PHOTOGRAPHIC REPRODUCTION OF DRAWINGS: GAY'S IMPROVEMENTS.

Mr. Eugène Gay's invention has for its object a photographic process by which it is rendered possible to obtain, at a small cost, drawings in black upon white whose appearance is identical with that of drawings made with Indian ink.

This process consists in treating glazed drawing-paper with a mixture composed as follows:—

Gum arabic	100 grammes.
Bichromate of potash	40 ,,
Water	300 centilitres.

A certain quantity of commercial carbonate of soda—half a gramme, for example—is preferably added to the water.

This mixture is spread, by means of a plush brush, upon the paper, which is then dried in the usual way.

The paper thus rendered sensitive is ready for the reproduction of a drawing on tracing paper.

As this paper is much more sensitive than ferro-prussiate paper, there is no need for a longer exposure to the light than five to fifteen minutes, according to the clearness of the day and the quality of the tracing paper, the opacity of which varies greatly.

The paper, after exposure, shows a dark yellow drawing upon a brownish ground. The paper is then submitted to a first washing, which must be very delicately carried out; then to a second, with the aid of a sponge, until the lines of the drawing appear hollow, owing to the dissolving action of the water.

The paper is then taken out of the bath, dried first with blotting-paper, and then exposed to the air.

The paper is afterwards coated by means of a sponge with the following composition:—

Gum lac	75 grammes.
Lamp-black	70 ,,
Spirits of wine of commerce	750 centilitres.

It is then plunged into a bath of hydrochloric acid, in which it is allowed to remain for about twenty minutes.

The paper whitens under the action of this acid, and the drawing comes out in black.

It is then cleaned by brushing and washing in pure water, then dried, and the operation is complete.

The claim is for a process which consists in sensitising the paper by means of a coating of gum arabic, bichromate of potash, and water; then drying and, after exposure, washing; then drying and coating with a composition of gum lac, lamp-black, and spirits of wine, plunging into a bath of hydrochloric acid, and then washing and drying.

APPARATUS FOR THE PRODUCTION OF OXYGEN GAS: STEDMAN'S IMPROVEMENTS.

Mr. Frederick Joseph Stedman, in carrying out his invention, employs a series of retorts, capable of being hermetically closed, connected to a main pipe, preferably closed at one end, and connected at the other end with a gas-purifier provided preferably at the gas-inlet side with a non-return valve. This gas-purifier is connected by a tube to a gas-container, whence a tube extends to the limelight jet or place where the gas is to be used. Below the series of retorts is a device for heating them, the latter being movable, automatically or otherwise, from one retort to another in succession, or otherwise controlled to effect the generation of gas at a rate

proportional to that at which it is withdrawn from the gas-container for use.

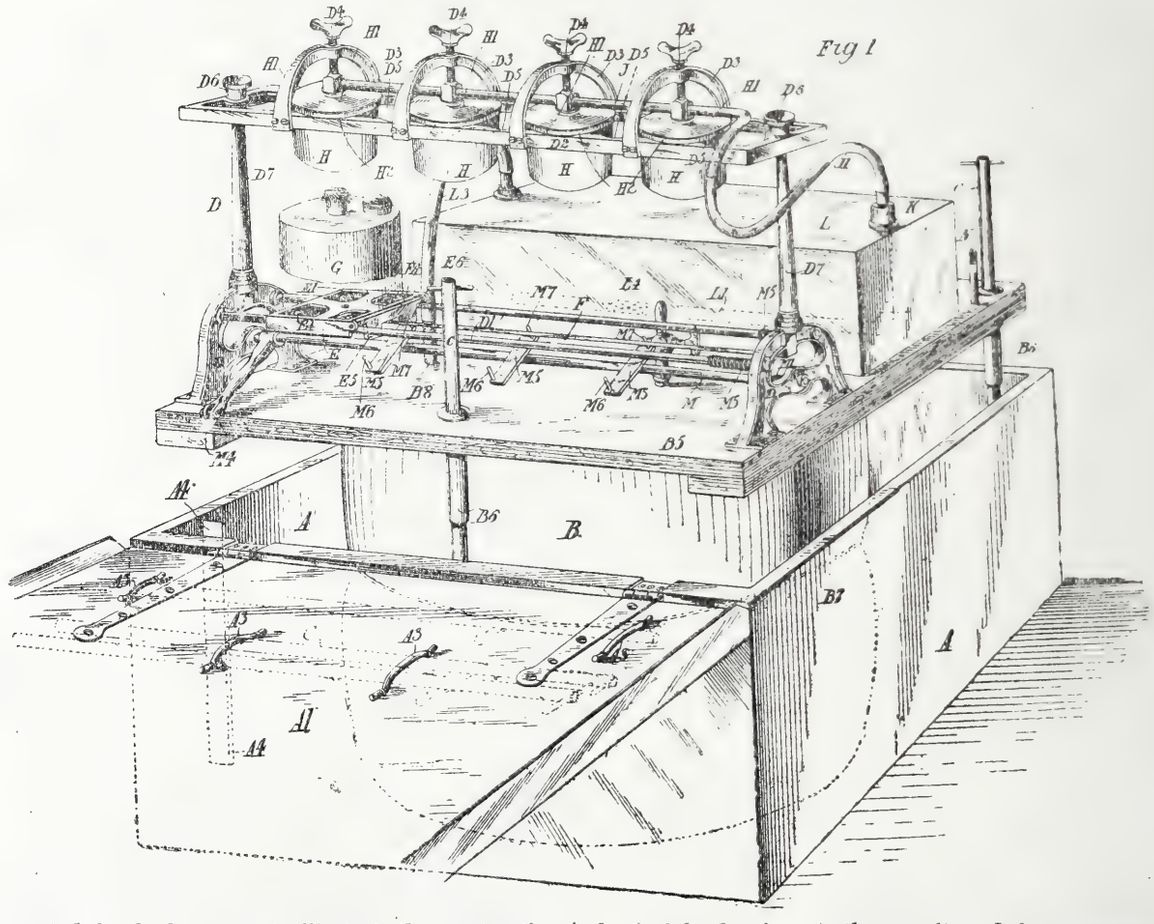
In order to obtain the necessary pressure upon the gas container, Mr. Stedman provides a weight or weights on the upper board or part thereof so arranged as to give as constant a pressure as possible. He finds it convenient for this purpose to use one or more tanks containing water, for instance, upon the gas-container, which tank or tanks may be used as gas-purifiers; the rest of the apparatus may be placed on the upper part thereof, to weight it for the purpose described.

The operation of the apparatus is as follows:—

The retorts having been filled with the gas-producing mixture, say chlorate of potash and oxide of manganese, and heat applied to the first retort by means of the heating device, oxygen is given off, and passes by the pipe to the gas-purifier, and thence into the gas-container where it is stored, being drawn off as required, through the delivery tube, the heating device shifting automatically to the second retort, and so on, when the gas-container needs replenishment.

In the accompanying drawings:

Fig. 1 is a perspective view of one construction of apparatus according



to the invention, parts being broken away to illustrate the construction of details where necessary.

Figs. 2 and 3 are elevations of the apparatus, at right angles to each other, and partly in section, to show the appliances by which the movable heating device, hereinafter referred to, is controlled and operated.

Like letters indicate like parts throughout the drawings.

A is a box in which the apparatus is transportable, and which forms a base for it when in use; A^1 is the box lid; B is a cylindrical collapsible container for storing the oxygen. It consists of a flexible collapsible tube, B^1, of gas-proof fabric, closed at its upper and lower ends by discs, B^2, having grooves, B^3, at their edges, into which the fabric is tightly drawn by windings, B^4, of cord or wire, so as to secure a gas-tight joint between the flexible tube and the discs aforesaid. As an alternative, a steel band with a tightening device at its ends may be substituted for the wire or cord binding. The lower one of the two discs, B^2, is fixed inside the box, A, to the bottom thereof.

B^5 is a plate which supports the generating apparatus, and is carried upon the upper disc, B^2. C are guide rods, which, when the apparatus is being used for generating oxygen, are screwed, as shown, into sockets, A^2, at the bottom of the interior of the box, and extend upwards through tubular guides, B^6, attached to the plate, B^5; in the expansion and contraction of the container, B, the plate, B^5, and the generating apparatus carried upon it, as hereinafter described, rise and fall, being guided in their rising and falling movement by the rods, C. The weight of the disc, B^2, plate B^5, and the generating apparatus on the latter, serves to maintain the necessary pressure upon the gas in the container, B. B^7 is an elastic band encircling the middle of the reservoir, so that, when it collapses, it may fold inward compactly.

The tubular guides, B^6, extend for a sufficient distance downward from the under side of the plate, B^5, to prevent it from descending too close to the bottom of the box, and thus the collapsible container, B, is protected against being crushed or compressed into too small a compass. A^3, are elastic loops provided upon the box lid, A^1, to receive the guide rods, C, and other parts of the apparatus when it is dismantled and packed for transport.

A^4 is a plate which operates in conjunction with apparatus carried on the moving plate, B^5, to release the movable heating device, as will hereinafter be explained.

On the plate, B^5, is a fixed framing, D, which comprises guides, D^1, on which travels a lamp carriage, E, running upon rollers, E^1 (figs. 2 and 3); F is a spring attached at one end, F^1, to the framing, D, and at its other end, F^2, coiled about and attached to a pin, E^2, carried in a bracket, E^3, extending from the under side of the carriage; this spring tends always to draw the carriage, from that end of its guides at which it is shown in fig. 1 of the drawings, to the opposite end, for a purpose to be hereinafter explained.

G is a lamp, screwed into the carriage, E.

Above the guides, D^1, is a frame, D^2, carrying a series of retorts, H. Above each retort is a cover, H^1, these covers being connected together by a tubular connexion, J, which communicates with the interior of each retort, and delivers gas from the retorts by way of a pipe, J^1, through a non-return valve, K, into a purifier or washer, L, carried, like the rest of the apparatus, upon the plate, B^5. The lids, H^1, are not intended to be removed from the retorts, but conversely, when the retorts have to be recharged, each is removed from beneath its lid; this enables the construction of the apparatus to be simplified. Each retort is provided with a flange, H^2, by which it rests, beneath its lid, upon the side bars of the frame, D^2. Above each lid is a cross bar, or bridge, D^3, through which passes a screw, D^4, whereby each lid can be forced close down upon the corresponding retort; the lids are flanged at, H^3, and the edges of the retorts grooved as at H^4, the flange fitting, if desired, into asbestos or other packing in the groove, so as to maintain a gas-tight joint between them. It will be seen, from fig. 1, that the side bars of the frame, D^2, are cut away at D^5, in proximity to each retort, so that, if the screws, D^3, be slackened back to enable the lids, H^1, to be raised, any retort can be moved along in the frame until it comes over the cut-away portions, D^5, of the bars, when it can be readily lowered downward and out of the apparatus.

The purifier, L, is a box into which, as aforesaid, the gas from the

retorts, H, is delivered at one end through a non-return valve, K; the inlet pipe, L, by which the gas passes from the non-return valve into the purifier, is led down to the bottom thereof, and along it, as shown in figs. 1 and 3, being perforated along the whole of its length with a number of minute perforations as at L^4 (fig. 1), through which the gas issues into the liquid contents of the purifier, rising to the surface thereof, and being withdrawn from the space, L^2, above the liquid, by a pipe, L^3, communicating with the interior of the container, B, by way of the nozzle, B^8, carried on the top of the plate, B^5.

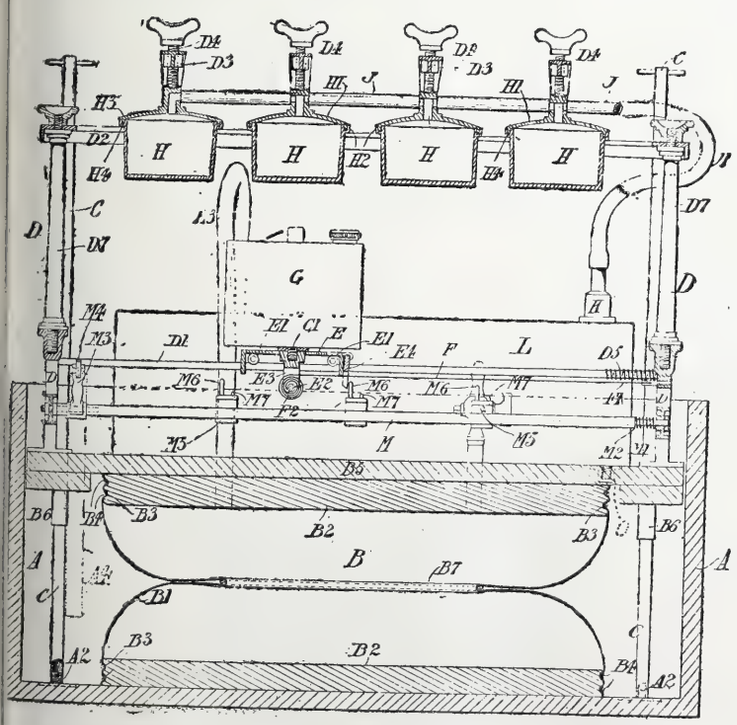
L^5, is an overflow orifice, provided in one wall of the purifier near the top, and having a screw plug, L^6; this orifice is provided, in order that, when the purifier is being charged with liquid through one of the other openings, it may be allowed to overflow at the orifice, L^5, to ensure that an excess of liquid shall not be supplied to the purifier; otherwise there would be a risk of overcharging it with liquid, which might be forced, by the pressure of the incoming oxygen, out by the pipe, L^3, and into the gas-container.

The purifier, L, and the rest of the apparatus carried upon the plate, B^5, are so disposed that, when the purifier is filled with liquid, there will be a fairly uniform distribution of weight upon the top of the container, B.

The means whereby the lamp, G, which effects the generation of gas, is caused to shift from one retort, H, to another automatically as soon as any one retort ceases to maintain the desired conditions of pressure and volume in the container, B, will now be described:—

M is a rod pivoted to the framing, D, and extending centrally beneath the guides, D^1, in a direction parallel thereto; it is free to have a slight endwise movement in the frame, D, against the resistance of a spring, M^1, in compression between the shoulder, M^2, and the frame. Fixed to one end of this pivoted rod is an arm, M^3, aforesaid, carrying at its outer end a roller, M^4. The rod, M, has transverse levers, M^5, fixed to it, each provided with two pins, M^6, M^7, the pins, M^7, being a little further advanced than the pins, M^6, in the direction of the travel of the carriage, E, away from the end, of the guides at which it is shown in the drawings. On the carriage, E, is a hinged depending flap, E^4, having two projections, E^5 and E^6; one of these projections, E^5, is adapted to come into engagement with the pin, M^6, the other being adapted to come into engagement with the pin, M^7. The flap, E^4, is hinged, in order that, when the carriage has to be moved from the right-hand to the left-hand end of the guides as viewed in the drawings, the flap will pass freely and without hindrance over the pins, M^6, M^7, which are not required to affect it until it commences its return journey. From the drawing (fig. 3) it will be seen that, when the arm, M^3, is up, the flap, E^4, and carriage will be engaged by one or other of the pins, M^6, but, when the arm, M^3, is down, the flap will be engaged by one of the pins, M^7.

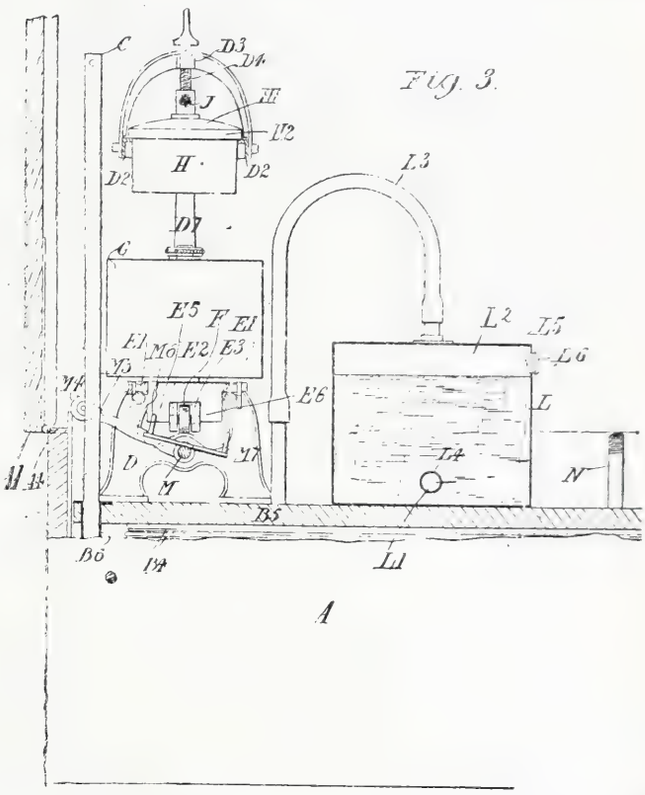
Fig. 2.



The position of the parts when the apparatus is to be started is as follows:—

The container, B, which is assumed to be empty, will consequently be collapsed, and therefore, the plate, B^5, will be at the bottom of its vertical travel in the box, A, the arm, M^3, then resting, by means of its roller, M^4, against the plate, A^4, on the inside of the box, so as to be held up. The carriage, E, is placed against the resistance of the spring, F, under the first retort, H, *i.e.*, that at the left-hand end of fig. 2, say, which is charged with the proper agents. With the carriage in this position, the projection, E^5, of the flap, E^4, is engaged and retained by the pin, M^6, on the first of the levers, M^5. The lamp, G, should then be lighted, whereupon oxygen will be generated from the contents of the first retort, and will

Fig. 3.



flow through the pipes, J, J^1, and non-return valve, K, into the liquid at the bottom of the purifier, L, by way of the perforations in the pipe, L^1, ascending through the liquid into the space, L^2, and out into the container, B, by way of the pipe, L^3; by this influx of gas, the container will be expanded, and the plate, B^5, and apparatus carried upon it will consequently rise. As soon as the plate, B^5, has risen to its full extent, the free end of the arm, M^3, will pass clear to the upper end of the plate, A^4, and will descend under the influence of gravity, thus moving the pin, M^6, of the arm M^5 (fig. 3) clear of the projection, E^5, on the carriage flap, and almost simultaneously bringing the other pin, M^7, on the same arm, M^5, into the path of the other projection, E^6, of the flap, so that the carriage, E, is able to make but a very slight movement, not sufficient to take the lamp, G, from beneath the first retort. Thereafter no change in the position of the parts takes place until gas is withdrawn from the container, B; this will have the effect of partly collapsing it, and bringing the plate, B^5, down again towards the bottom of the box A. As soon as the plate has descended sufficiently far to bring the outer end of the arm, M^3, into contact with the top of the plate, A^4, the latter will begin to raise the arm, and a small further descent of the plate, B^5, will raise the arm so far as to remove the pin, M^7, out of contact with the flap, E^6, and allow the carriage, E, to fly forward under the influence of its spring, F; but the operation of removing the pin, M^7, on the first of the arms, M^5, out of the path of the projection, E^6, on the flap effected simultaneously the insertion in the path of the carriage of the pin, M^6, on the succeeding arm, M^5, by which the carriage will be stopped as soon as it has moved sufficiently far to bring the lamp under the second retort, H. This retort in turn will deliver its oxygen into the purifier, L, and container, B, and restore the desired conditions of pressure and volume in the latter, after which the operations similar to those described with reference to the generation of gas from the first and second retorts will be repeated, until the contents of the series of retorts have been utilised.

The non-return valve, K, enables the retorts, H, to be removed from beneath their covers, H^1, for recharging whenever desired, without risk of the return of gas or liquid into the retorts by way of the pipes, J J^1.

The capacity of each retort is preferably so related to that of the container, B, that just sufficient gas is given off by the contents of one retort to completely fill the reservoir. If desired, springs, D^5, may be provided upon the guides, D^1, to check the movement of the carriage, E, at the end of its travel. When the pins, M^6, M^7, are struck by the projections, E^5 E^6, from the carriage, E, spring, M^1, allows the rod, M, to yield, in order that the motion of the carriage and the lamp, G, may not be too suddenly checked.

The whole apparatus is preferably so constructed that the various

portions can be readily taken apart and stowed compactly in the box, A, for transport.

N are studs secured at opposite ends of the plate, B^5, at the same distance apart as that of the pillars, D^7, upon which the frame, D^2, is supported, so that the said frame, when the apparatus has to be moved from place to place, can be taken from the pillars, D^7, and secured upon the studs, N, by the screws, D^6, which ordinarily hold it in place upon the pillars; these latter can be unscrewed from their places and put into the loops, A^3, of the lid A^1. The lamp, G, is provided with a stem, G^1, which screws into the carriage, E, and also screws into a socket, O, on the platform, when the apparatus is to be moved from place to place.

Instead of employing a spring, F, to move the lamp carriage, E, along the guides, D^1, a weight or other motive agent can be applied thereto for a like purpose; or the weight of the lamp and carriage will suffice for their own propulsion if the guides be slightly inclined. Any releasing device or motive agency controllable by the variation of quantity of gas in the container could be employed for the purposes of this invention in place of the apparatus hereinbefore described by way of example.

Mr. Steadman's claims are:—

1. Apparatus for producing oxygen in which the application of a heating agent to a retort is so controlled automatically as to proportion the generation of gas to the expenditure thereof.

2. In apparatus for producing oxygen the combination of a retort or series of retorts and a heating device movable automatically in relation to each other according to the consumption or expenditure of the gas for the purpose specified.

3. Apparatus for producing oxygen in which the heating device is automatically moved from one retort to the next or along the retort as the gas generated in the retort or part of the retort already heated is used up or expended.

4. In apparatus for producing oxygen, the combination with a retort or series of retorts and a heating device, such as, G, tending normally to move relatively to each other, of devices operating to permit such movement only upon reduction of the quantity of oxygen in a container for the purpose specified.

5. In apparatus for producing oxygen, the combination with a retort, or series of retorts, and a heating device, such as G, tending normally to move relatively to each other, of devices to effect such movement upon reduction of the quantity of oxygen in a container for the purpose specified.

6. In automatically controlled oxygen-producing apparatus of the kind described, releasing gear such as M M^5, controlling the movement of the heating device or of the retorts and operated by the movement of a part of the gas-container, B.

7. In automatically controlled oxygen-producing apparatus, the combination with a travelling heating device such as, G, of a rod, M, and arms, M^5, thereon with or without buffing springs or a hinged projection, E^4, for the purpose described.

8. In apparatus for producing oxygen, the combination with a retort or retorts and a heating device movable relatively to each other of operating or controlling mechanism therefor.

9. In oxygen-producing apparatus of the kind described the combination with a gas-container of a rising and falling platform, B^5, carrying the whole or a considerable portion of the rest of the apparatus.

10. Apparatus for producing oxygen so constructed and arranged as to operate whilst contained in an open box, into which it will pack for transport substantially as described.

11. In apparatus for producing oxygen, the combination with a series of flanged retorts, H, of a frame, D^2, cut away as at D^5, for the purpose specified.

12. The combination and arrangement of parts constituting a complete apparatus for the production of oxygen, substantially as and for the purpose described and illustrated in fig. 1, 2, and 3 of the accompanying drawings.

EXHIBITION OF THE WOOLWICH PHOTOGRAPHIC SOCIETY.

We are pleased at being able to congratulate the Woolwich Photographic Society upon the decided improvement of their Exhibition over that of last year. This year's Exhibition, which was open on the Thursday, Friday, and Saturday of last week, had certainly the advantage of being held in a more suitable class-room at the St. John's Schools than that in which it was held last year; indeed, as good a gallery is at the command of very few societies, and it must be said in favour of those who had the management of the Exhibition that the best was made of the opportunity. An admirable arrangement was made for hanging the pictures, and the hanging itself was done with considerable taste.

The Society has had the courage to adopt the plan of not offering any medals or awards, and there is no reason to believe that the show was less representative of the best work of the members in consequence. This year, much to the gain of the Exhibition, a selection only of the pictures sent in was hung.

Many of the exhibitors would do well to study the appropriate in the matter of frames, for quite a large proportion of them seem to fail to realise the fact that the frame is intended to show the picture to its best advantage, and that an exhibition is one of pictures, and not of frames. There were many cases where silver filagree frames and others of a fancy character entirely spoilt the effect of the pictures they surrounded.

Among the members, G. Tapp was the only representative of the extremely advanced school; though faulty in the photography, they showed promise. H. G. Maskell's exhibits were unequal in quality; the flower pictures were perhaps, on the whole, the best. H. H. Barber had a pleasing little picture in *The Silent Highway*, printed in green carbon. J. Borthwick Panting's best. *Bedruthan Steps*, would have deserved praise but for the frame. J. W. Machen, the Hon. Secretary of the Society, had some careful and good work. C. Churchill's was a numerous exhibit, too numerous by far for his own reputation, for there was some very careless work among it; *Declining Day* pleased us most. W. H. Dawson's pictures were mostly interiors, and were very creditable. H. J. Spencer's work was careful and painstaking. H. J. Redding had a good example of how not to print in clouds, but some of his smaller pictures were pleasing, *Evening on the Lake* was perhaps the best. J. Calder's series of snap-shots, mounted in red plush, with a maple frame, were a nightmare. W. Thompson's series, illustrating military life at Aldershot, and particularly the picture of ballooning, were interesting. H. J. Dalby had, in *A Quiet Pipe*, a good subject, but the best was not made of it—a broom, apparently used to help the composition, made a very awkward line. A frame of portraits was noticeable for the extreme want of rectangularity of the mounts. J. Hope's work showed care.

A very noticeable feature of the Exhibition was the large entry of lantern slides, there being thirteen sets of six, and, contrary to our recent experience at local exhibitions, they were as noteworthy in quality as in quantity. In many, perhaps the majority of, cases the slides were from the same negatives as exhibited prints, and, on the whole, they were far superior. A considerable proportion were very fine slides indeed. The best sets were those by Messrs. J. Cregan, W. H. Dawson, H. J. Redding, W. Thompson, J. Desfoyes, and C. Churchill; but, as things go nowadays, there was not a really bad set. A set of half-plate transparencies by Mr. C. Churchill were so good that his prints surprised us.

A frame of good X-ray photographs by Mr. J. H. Quick had an interesting story about them attached.

A loan collection of pictures had in it several old acquaintances by Messrs. J. T. French, C. H. Oakden, J. Gunston, T. N. Lovett, H. Esler, the Autotype Company, and others; and Messrs. R. & J. Beck, the Prosser-Roberts Company, J. F. Shew & Co., the Thornton-Pickard Company, Messrs. W. Tylar, A. J. Wing (of Woolwich), and B. J. Edwards had good shows of their particular manufactures.

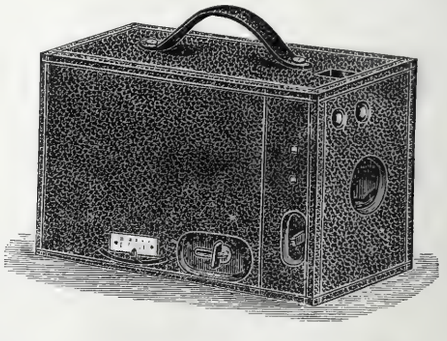
At the close of the Exhibition on Saturday evening, a handsome aneroid barometer, suitably inscribed, which had been subscribed for by a number of members, was presented to Mr. J. Borthwick Panting, late Hon. Secretary of the Society (1892–6). Mr. Panting has been indefatigable, and the progress of the Society has been, in very large measure, due to his energy.

Our Editorial Table.

The "Bull's-eye" and "Bullet" Kodaks.

The Eastman Photographic Materials Co., 115, Oxford-street.

These two little cameras, though built on the same lines, yet have one important point of difference, for, whereas the Bull's-eye is designed exclusively for taking cartridge film, which can be unloaded and reloaded in daylight, the Bullet is also adapted for glass plates in dark slides. In the latter case, the change from film to plates can be made in a few seconds, a door in the side of the



Bullet opening to receive the plate-holder. The No. 4 size of the Bull's-eye and the No. 4 of the Bullet take 5 × 4 pictures, and each camera has two view-finders and two sockets for the tripod screw, so that vertical and horizontal pictures can be taken. There is also an accurately adjusted focussing scale. The single achromatic

lenses are of excellent quality, and have a set of three stops. Snap-shot or time exposures are given by means of a rotary shutter, which is always set, and is actuated simply by pushing a lever to the right or to the left, alternately. Near the exposure lever are slides for controlling stops and time movement. We can speak from practical experience of the Bull's-eye as easy and pleasurable to use, and therefore likely to be popular with tourist photographers.

La Plaque Photographique.

By Captain Colson. Paris: G. Carré & C. Nand.

After reviewing the properties of the sensitive surface of gelatino-bromide of silver, and the principles underlying its preparation, the author treats of the chemical, luminous, calorific, mechanical, and electrical influences to which the plate is subject. The theory of the latent image, and the precise part which the gelatine plays also come in for observation. The X rays and the photographing of the invisible, as well as the photographing of objects through opaque bodies, occupy a considerable section. The book, which is the result of much study and knowledge, appeals to the student of the many interesting phenomena that cluster round a sensitive gelatine plate.

The Vanguard Photographic Specialities.

The Vanguard Manufacturing Company, Maidenhead.

In addition to the samples of this Company's specialities that we have already noticed, we have received some excellent negative varnish, and the Autogene negative density corrector, presumably a mercuric solution for intensification purposes. We note that the Company's adhesive preparation, Glutogene, which we find a capital mountant, is in future to be sent out in collapsible tubes instead of in glass jars. The Company's preparations are of admirable quality, and deserve to have a large sale.

News and Notes.

Photographic Club.—Wednesday evening, March 10, at eight o'clock Members' Open Night: Slides, &c.

Royal Photographic Society.—Ordinary Meeting, Tuesday, March 9, at eight p.m. *Demonstration on the Making of Pictures*, by W. L. Wyllie, A.R.A.

Old members of the London and Provincial Photographic Association will regret to hear of the death of Mr. C. H. Trinks, a former member of that Society, which took place at Hanover on February 22.

Mr. Gambier Bolton, F.Z.S., attended at Marlborough House last week, and had the honour of presenting his series of carbon photographs of the animals at Sandringham to H.R.H. the Prince of Wales, who was pleased to accept them.

The Annual Exhibition of the South London Photographic Society will be opened on Saturday evening next (6th inst.), at 6.30, by Mr. T. Sebastian Davis, F.C.S., F.R.P.S. The Exhibition will remain open during the whole of the following week. There are a greater number of pictures and exhibits than last year.

Polishing Aluminium.—Aluminium will take and retain a very high polish, fully equal to that of silver. The truly distinctive and beautiful colour of aluminium is best brought out in a highly polished plate. Aluminium can be polished on a buffing wheel with rouge, the same as brass, and for polishing any considerable quantity of sheets this, of course, is the most economical way. In the absence of any special aluminium polish, several of which are on sale, the ordinary cold brass polish will be found quite efficient if it is ground fine enough. "Acme polish" has earned a well-merited reputation in America; it consists of the following materials: Stearic acid, 1 part; fuller's earth, 1 part; rotten-stone, 6 parts. The whole ground very fine and well mixed. Use a fine white polishing composition, or rouge, or tripoli, and a sheep-skin or chamois-skin buff, although it is often polished with an ordinary rag buff.

The Benevolent.—The Annual General Meeting of the Photographers' Benevolent Association was held at the rooms of the Royal Photographic Society on Friday, February 26, and was attended by a larger number of ordinary members than any similar meeting for several years. The business was almost entirely formal, but one important matter, the plan for rendering the annuity fund available for general purposes, gave rise to a great amount of discussion. Some two hours were spent in debate, the principal speakers being Messrs. L. C. Brookes, G. T. Harris, W. A. Rose, R. P. Drage, John Spiller, A. Mackie, R. Child Bayley, H. C. Rapson, R. L. Allan, E. W. Parfitt, and the Hon. Secretary. Finally, the recommendation of the Council was accepted *nem. con.* The following gentlemen were elected to serve on the Committee for the ensuing year, viz.: *President:* Mr. George Mason.—*Trustees:* Messrs. W. S. Bird and John Spiller, F.I.C., F.C.S.—*Committee:* Messrs. A. Mackie (Chairman), R. Child Bayley, Robert Beckett, F. H. Berry, R. P. Drage, Charles Faulkner, G. T. Harris, H. R. Hume, E. W. Parfitt, H. C. Rapson, J. S. Rolph, and E. J. Wall.—*Treasurer:* Mr. John Spiller, F.I.C., F.C.S.—*Hon. Secretary:* Mr. H. Snowden Ward.

An Artist on the New "Colour Photographs."—I went on Wednesday evening last to the Society of Arts to hear Sir Henry Trueman Wood lecture on the production of colour by photographic methods. Now, when in the small hall the subject to be discussed is art or anything connected with it, I am used to half-empty benches and a consequent excellent choice of seats. So I sauntered in confidently just as the clock was striking eight. The hall was packed to overflowing. The glass doors, as a rule kept closed, were thrown wide open, and the outer hall, too, was thronged with an eager audience. I suppose every photographer in town was there, professional and amateur both, as I knew without the whispered suggestions to adjourn to the Camera Club, which kept me half the time from hearing what the lecturer was saying. Photography is the thing the public really likes. What is the use of the artist when you have a machine that can make all the pictures you want for you? The result of the crowd and the friendly whispers at the far end of the outer hall, where I was forced to stand all the evening, was that half the time, as I have said, I could not hear; while, when it came to showing the colour photographs on the screen, excited photographers stood up on the benches in front of me, and then most of the time I could not see. However, I gathered that Sir Henry Trueman Wood devoted much attention to Mr. Ives's ingenious invention, which I have already talked about here, and that he could tell us less about M. Chassagne's process, the Frenchman wisely keeping it a secret. And a number of photographs were shown downstairs. There was Mr. Ives's kromskop or photo-chromoscope, with the inevitable box of sweets; and there were photographs, looking for all the world as if they had been tinted by hand, neither more nor less interesting. Indeed, so far, colour succeeds in little but in emphasising and intensifying all that is ugliest and most unpleasant in the photograph. Scientifically, these new inventions are, no doubt, most wonderful, but to the artist they are hopelessly depressing. If Nature is really like this, why, then, let us be thankful that we cannot see Nature as she is. Perhaps, if an artist, understanding the beauty and value of colour, were to come to the assistance of the photographer, the outlook might be more promising. But I suppose in all that large hall there was not an artist—I was outside.—*The Star.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
8.....	Camera Club	*Some Recent Investigations relating to X-ray Work.* Campbell Swinton.
8..	Ealing	*Enlarging.* A. Richardson.
8...	North Middlesex	*The Chemistry of Development.* Ernest Benest
8.....	Richmond	*Hand-camera Work.* W. Thomas, F.R.P.S.
9.....	Ashton-under-Lyne.....	*A Holiday in Spain.* John T Lees.
9.....	Birmingham Photo. Society ...	*X Rays Demonstration, Up to Date; with Illustrations of the Latest Discoveries, Appliances, &c.* J. F. Hall-Edwards, L.R.C.P., M.R.C.S.
9.....	Hackney	*Incubators.* L. S. Wilks.
9.....	Halifax Camera Club.....	*Platinotype for Beginners.* W. Booth.
9.....	Newcastle-on-Tyne	*Printing-in Clouds.* J P. Gibson.—*High-speed Shutter-work.* W. E Cowan.
9	Rotherham	*Practical Pictorial Photography.* A. Horsley Hinton.
9.....	Royal Photographic Society ...	*Demonstrations on the Making of Pictures.* W. L Wylie, A.R.A.
9.....	Wolverhampton	Competitive Exhibition.
10.....	Borough Polytechnic	Printing on Presto Paper.
10.....	Croydon Camera Club	Lantern Night.
10.....	Leeds Camera Club.....	*Zincography.* W. T. Wilkinson.
10.....	Leytonstone	Fifth Annual Dinner.
10.....	Photographic Club	Members' Open Night: Slides, &c.
11.....	Camera Club	*Forty Years' Mountaineering.* Hon. Justice Wills.
11	London and Provincial	*Artigue Process of Printing.* J. A. Sinclair.
11-12	Manchester Photo. Society	Exhibition of Members' Work.
11.....	Munster	Prize Slides.
11.....	Oldham	*At Home Subjects.* J. Chadwick
11.....	Stockport	*Loiterings with the Camera.* J. W. Wade.
11.....	West Surrey	*Photo-micrography.* T. Charters White.
11.....	Woolwich Photo. Society	*Lantern-slide Making.* Fred. W. Machen.
12.....	Bournemouth	*Photographic Chemistry.* W Jones.
12.....	Bromley	Annual Meeting.—*In the West Country.* Dr. Scott.
12.....	Croydon Microscopical	Conversational Meeting.
12.....	Ireland	*Acetylene Gas as an Illuminant for Enlarging.* Dr. Scott.—Lantern Views by Members.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 25,—Mr. Philip Everitt in the chair.

Mr. Smith drew attention to a peculiar mark, of a lighter tint than its immediate surroundings, on a print which had been stuck in an album. A few days after its insertion this mark developed, and to remedy the defect he covered it with another print. He had thought it a simple case of fading; but in a short time the second print exhibited a similar mark in the same place, the action having come through the substance of the print. He would be glad to have the opinions of those present.

The Chairman remarked that, the position of the stains agreeing in both prints, the fault could hardly be due to them. It might have been caused by some chemical or sour paste in the leaf of the album.

Mr. R. Beckett said a splash of hypo or other foreign substance would account for the mark. If the mount were bad, the appearance should not be so local.

Mr. J. E. Hodd thought the film, which he proceeded to pass round, would be interesting in its bearing on the formation of the pyro-developed image, and the question of eliminating entirely an image so developed. The whole of the silver had been removed from the film, nothing being left but a clearly defined pyro image.

The Chairman was doubtful as to the true composition of the image, and asked whether Mr. Hodd had tried to redevelop the same.

Mr. Hodd had not endeavoured to do so. He was firmly of opinion, however, that it was purely a pyro image.

The Chairman would not positively assert that it was not a pyro image, but he thought it would be possible, with a physical developer, to redevelop it, and recommended a trial. He had not done such a thing himself, but could mention names in cases where it had been done.

A discussion ensued as to the possibility of totally removing the silver from the film.

The Hon. Secretary (Mr. T. E. Freshwater) said it had been announced that he, in conjunction with Mr. Wall, would give a practical demonstration on the subject of *Polarised Light*. Unfortunately, he had but that day learned of the indisposition of Mr. Wall, who had promised to undertake the descriptive part that evening, and he was left in a somewhat difficult position. He proposed to carry out the display, however; but, on account of the short notice, he would not go into the principles of polarisation, contenting himself with a description of the specimens and apparatus, which would fully occupy his attention. The polarising apparatus was contained in an attachment to the lantern front, and properly consisted of two Nicol prisms, of which the back one played the part of polariser, and the front that of the analyser. It was better, Mr. Freshwater said, to have a direct polariscope than a reflecting one; but the latter did very well for many things, and, moreover, was much cheaper. An instrument made up with Nicol prisms was somewhat expensive. The objects he showed were chiefly composed of two elements—selenite, which was found in various parts of the world, though the best for splitting came from the Hartz Mountains; and mica. These materials are split into very thin flakes, and, on examining them through the polariscope, you get, according to their thickness, the different wave-lengths. Mica was much easier to split than selenite, and with the better qualities it was possible to split them to the quarter wave-length. He proceeded to pass through the lantern specimens of various shapes and designs, producing upon the screen most beautiful and interesting effects in a profusion of colour. By rotating the analyser a constant succession of changes of tint were assumed by the objects, which included, besides selenite and mica, sections of rock, amethyst, granite (showing mica, hornblende, and felspar), benzoic acid, and other crystals, quartz, and several others. The structure of some of the specimens was clearly visible and the colours very vivid. It was shown how a piece of mica altered the colours produced by selenite, the blue changing to red, and the yellow to purple, and several other combinations were exhibited. A very pretty experiment was that with a piece of glass, which, in its natural state, produced no colour upon the screen; but, upon being subjected to considerable stress by turning two screws, brilliant colour effects were produced. Pieces of unannealed glass, with their many grotesque figures, attracted considerable notice. By means of a double-image prism giving upon the screen two partly superimposed discs, and a piece of selenite, it was shown that almost pure white was projected where the two discs overlapped, while those parts of the discs which were not superimposed were distinctly coloured. Similarly with four discs, likewise overlapping, a somewhat purer white was obtained, the single portions of disc remaining coloured. Mr. Freshwater concluded by showing the polarisation of minute particles in a glass vessel containing water, to which a few grains of resin dissolved in alcohol had been added.

The Chairman, in proposing a vote of thanks to the Hon. Secretary, and Messrs. Newton & Co., to whom they were indebted for the loan of the instruments, remarked that perhaps the demonstration was better than a paper, as it was seldom one got a chance to *see* such experiments with polarised light. The vote was carried unanimously.

PHOTOGRAPHIC CLUB.

February 24,—Mr. A. W. Isenthal in the chair.

Mr. Sidney Keith was proposed a member of the Club.

Travellers' Night,

by J. J. Vezey. The lecturer took the members of the Club and many visitors upon an interesting tour through the following towns, viz., Rothenburg, Nuremberg, Bamberg, Regensburg, and Ulm. It is difficult, perhaps impossible, to do justice in a written report to the admirable series of slides shown upon this occasion. Considered from either of the standpoints of selection of point of view, interest of subject matter, or technique, the pictures were equally meritorious and pleasing. To be conducted through these interesting mediæval cities, to be shown pictorial representations of many unique examples and styles of architecture—Gothic, Perpendicular, and Renaissance, and to have lucidly yet succinctly enumerated the characteristic peculiarities of each and all, was the happy good fortune of those present. The lantern slides were from negatives made by Commander Gladstone.

The Chairman and Mr. Bridge only voiced the meeting when they thanked Mr. Vezey for his attendance and capital show.

Croydon Camera Club.—The subject on Wednesday, February 24, was the important one of

Intensification and Reduction of Negatives,

by Mr. Thomas Bolas. The paper, which was illustrated by means of lantern slides, was, in the absence of the author, read by Mr. James Packham, F.R.P.S., and evoked great interest. The meeting for the current week will be devoted to *Carbon Printing*, Messrs. Kough, Packham, and Jenkins being announced as those who will explain and illustrate the procedure. It was announced that the net proceeds of the forthcoming public lantern show, on March 24, will be handed to the Croydon Hospital. A strong programme is anticipated, including a fine series illustrating *The Palace of a Prime Minister*. This show will be held at the small Public Hall.

Croydon Microscopical and Natural History Club (Photographic Section).—February 26.—A demonstration on the

Carbon Process

was given before the members of this Club by Messrs. J. H. Baldock, F.C.S., and Charles Moss. The principle involved in carbon printing (pigment printing would be more strictly accurate) is not new, the chemical action upon which it depends having been observed more than forty years ago, but practical application of it was, perhaps, first made by Swan in 1864, improvements being introduced by Johnson in 1869, Sawyer in 1874, and Lambert in 1875. The basis of the process is the action of light upon organic matter in the presence of the alkaline bichromates, and this we can show you at once by taking a piece of tissue, one half of which has been bichromated, the other half not, and exposing the whole to light; on immersing this in hot water—say, 110° Fahr.—it will be seen that the plain half dissolves away, while the bichromated half does not. Obviously, therefore, if we place such a piece of sensitised tissue behind a negative, the light passing through the negative will act upon the tissue, rendering it more or less insoluble, according to the different densities in the negative. If now such tissue is washed in hot water, the soluble part is washed away, leaving a positive picture, in the colour of which the tissue was composed. "We may assume that no one will care to prepare their own tissue, as it is a somewhat tiresome process, but will prefer to obtain it in cut sizes, either sensitised or unsensitised. If bought sensitised, it must be borne in mind, first, that only a limited number of colours are usually supplied in this condition; and, secondly, that sensitised tissue will not keep beyond ten or twelve days, after which it begins spontaneously to get more and more insoluble, whereas the unsensitised tissue will, with care, keep almost indefinitely, but it should not be allowed to get damp, nor yet "bone dry." If the tissue has been bought ready-sensitised, it can, of course, be used at once for printing; but, if not, it must be sensitised, which is really, as we shall show you, a very simple and easy process. Dissolve 1 ounce of potassium bichromate in 1 pint of (hot) water, and when cold add about 5 minims of strong ammonia ·880, or till the solution ceases to redden blue litmus paper. Pour this solution into a dish, and float on it the tissue, letting both sides get thoroughly wet and free from air bubbles, for two minutes in summer and three minutes in winter; take it out, allow it to drain for a few seconds, place it face downwards on a sheet of glass, squeegee away all surface moisture, and dry it in a warm, darkened room as quickly as possible. The next process is the printing, and it is here, and only here, that any difficulty or uncertainty comes in, because there is of necessity no visible image. The time required can be gauged by means of actinometers, of which there are several, *i.e.*, Johnson's, Sawyer's, Burton's, Bankart's, Woodbury's, and Wynne's; but, if none of these are available, a good substitute is albumenised paper, selecting a negative about the same density as those to be used for the tissue. A piece of paper is exposed under this negative at the same time, and to the same light as the tissue; when rather more than half printed, it may be assumed that the tissue is fully printed, and the frames removed from the light. It must never be forgotten that, after the prints are removed from light, printing still goes on, owing to what Captain Abney has described as the "continuing action of light," which goes on for several hours in the dark, provided the tissue is kept exposed (in the dark, of course) to a moist atmosphere. Under pressure and in dry air, this "continuing action" is reduced to a minimum, if not entirely arrested. Advantage may be taken of this fact, for prints half or even a quarter done, late in the day or in the dull days of winter, will, if kept, say, till the following day before development, be sufficiently printed; *per contra*, a fully printed picture should not be kept long, or it will be overdone, and an over-printed picture looks flat and devoid of contrast. Having now exposed our tissue, the next thing is to develop it, and at this point it is necessary to determine whether we are going in for the single or double-transfer process. We may here explain that the single transfer gives us reversed pictures as to right and left (which sometimes is of no consequence), while double transfer renders the pictures in their natural position. As the two processes run so very closely together, we propose, for the sake of brevity, to treat then as one, pointing out simply where they differ. 1. A piece of single-transfer paper (if for double transfer, a piece of temporary support) is placed in a dish of cold water, then a piece of the exposed tissue, and, when this latter has curled and uncurled, it is brought into contact, under water, with the support, avoiding air bubbles, brought out, laid on a sheet of glass, squeegeed to rid it of surface moisture, placed between thick blotting-paper, and put under pressure for, say, ten minutes, or longer if the support is thick and rough. 2. Prepare a bath, having a thermometer in it, with water at 100° to 120°, and in this float the print and its support; when the gelatine shows signs of softening, which is known by its exuding at the edges, carefully remove the paper (under water) on which the tissue was spread, and throw it away; now place the support, with the partially revealed picture on it, upon a sheet of glass, and with the hand or a piece of sponge carefully wash away all the unaltered gelatine till the picture stands out clear and well defined, and nothing more seems to dissolve away from it. The reason why the picture has to be developed from the back is because the whole of the face of the print is insoluble, the picture being shut up, as it were, between this insoluble surface and the paper on which the pigment rests. 3. Next place it in cold water, to stop development, and then, 4, in five per cent alum, to harden the film and clear it of bichromate; it should remain in this twenty to thirty minutes, according to the thickness of the support. 5. Rinse well from the alum in cold water. If single tranfer has been selected, the prints may now be hung up, and when dry are finished; but, if double transfer has been adopted, two other processes follow those already described. In this case, we have the picture either on waxed paper, waxed opal, or collodionised opal, to either of which it adheres when wet, and may be developed on them; but, after the alum and rinsing in water, it becomes necessary to retransfer the image from its temporary to its final support. To this end, a piece of final support is brought into contact, under water, with the wet picture, taken out

and very carefully squeegeeing the two together, to obtain contact, remove excess of moisture and any little air bubbles there may be. The two are now hung up to dry, which takes some hours, in a warm room, and when quite dry the finished picture leaves its temporary support, finally appearing on its final support, ready for mounting, spotting, working in monochrome or colour, &c., and framing. The waxing solution consists of resin 3 parts and beeswax 6 parts, dissolved in turpentine 20 parts, or it may be obtained of the Autotype Company, 74, New Oxford-street, to whom we are indebted for some of the beautiful examples which we show you to-night, produced by them by this interesting process. In conclusion, we may state that, although we have often heard it urged against the carbon process that it is difficult and dirty, we hope that we have succeeded to-night in proving to you that it is neither the one nor the other, but that it affords a means of obtaining a variety of beautiful, artistic, and *permanent* pictures obtainable by no other means."

North Middlesex Photographic Society.—March 1, Mr. A. H. Lisett in the chair.—Mr. E. R. Mattocks produced a reducing camera, made of strawboard, after a model shown by Mr. H. Stuart at a previous meeting. Mr. STEELE asked the cause of iridescent spots on a negative stripped with cresco-fylma. Mr. J. MACINTOSH thought they would disappear on washing. Mr. H. CROUCH said he had seen the results in colour photography shown by M. Chassagne, and was much disappointed with the results, but he thought Mr. Ives's three-colour process, shown at the Royal Photographic Society last Tuesday, were excellent, and very true to nature. The second lantern-slide competition then took place, which resulted in a very good show, Mr. A. H. Lisett and Mr. J. L. Treadway tieing for first place, and twelve others were selected for the Society's collection.

South London Photographic Society.—At the last ordinary meeting, Mr. W. F. Slater (Vice-President) in the chair, Mr. S. E. WALL, of the North Middlesex Photographic Society, attended and gave a lantern lecture on

ARCHITECTURE.

The lecturer first gave some illustrations of the Roman Baths at Bath, after which he proceeded to point out the peculiarities of the various succeeding styles of work in this country, and concluded by showing that, after a lapse of a period of about 2000 years, there was a return to exactly the same forms of doors and windows as existed were produced in Roman times. Specimens of slides produced with Liesegang's transfer paper were shown.

Woodford Photographic Society.—February 18, Mr. E. Marriage in the chair.—Among the items of interest shown were a couple of large transparencies that Mr. Wilmer brought—these were specimens of the latest development of colour photography by M. Chassagne, and created a good deal of interest. Mr. Wilmer was heartily thanked for giving the members an opportunity of seeing these interesting examples. Mr. EMLER, the Secretary, read a paper on

SOME FAILURES AND THEIR LESSONS.

The failures dealt with were of a nature that the photographer is likely to meet with in the course of his experience, and were not due to carelessness or neglect; examples were shown, and a good deal of discussion ensued.

Darwen Photographic Association.—February 25, Mr. MITCHELL, of Blackburn, gave a lecture on

ANIMATED PHOTOGRAPHS.

After demonstrating the technical working of the subject, Mr. Mitchell projected a number of pictures on the screen, which were thoroughly appreciated by the audience. At the close of the meeting, Mr. Mitchell and his assistant were accorded a hearty vote of thanks. The electric light was kindly provided gratis by Messrs. Potter & Company, Darwen.

Liverpool Amateur Photographic Association.—February 25, the President (Dr. J. W. Ellis) in the chair.—Messrs. William Mallinson, B.A., Lond., C. Fynney Depree, E. E. Thorp, T. J. Davies, and G. A. Billington were elected members. Mr. A. HORSLEY HINTON gave a paper on

ART IN RELATION TO PHOTOGRAPHY.

The lecture was illustrated by a number of very fine photographic pictures, the work of the lecturer, and also by a series of lantern slides, showing the raw material from which the pictures were made. There was a good attendance of practical members of the Society, and the pictures and the skill of their author were much admired. At the conclusion of the lecture there was a short discussion, after which a hearty vote of thanks was accorded to Mr. Hinton for the pleasure and instruction he had given to the members.

Newcastle-on Tyne and Northern Counties' Photographic Association.—February 23, Mr. J. J. Kirkwood in the chair.—Mr. JOS. JOBLING gave a lecture on

WORKING UP BROMIDE ENLARGEMENTS,

which was illustrated by examples of finished work, and by an exhaustive demonstration of the methods to be employed, both in landscape and portraiture. Mr. W. Thompson afterwards exhibited a photo-micrographic apparatus of his own construction. In a discussion which followed, Dr. Blacklock said he preferred to use an ordinary camera and lens, the camera extended to the solar focus of the lens, and the latter pressed against the eye-piece of the microscope.

Oxford Camera Club.—February 22, Colonel Impey in the chair.—A lecture,

AT HOME SUBJECTS,

by Mr. W. Thomas, was read by Mr. Sells; the accompanying slides were shown by Mr. Holliday. The lecture was much appreciated, and was considered to be a valuable and instructive one. In the discussion which followed, Mr. E. Ryman-Hall strongly advocated his system of tentative development with pyro soda, first pouring on the alkali and adding the pyro dry as required. The next meeting will be of a social character on March 8; Mr. Joyce will exhibit his cinematograph.

FORTHCOMING EXHIBITIONS.

1897.		
March 6–13	South London Photographic Society.	Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
April 3–May 1	*Edinburgh Photographic Society.	Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.
,, 19	Beverley Photographic and Sketching Society.	Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Patent News.

THE following applications for Patents were made between February 17 and February 24, 1897:—

CAMERAS.—No. 4037. "Improvements in Photographic Camaras." C. PHILLIPS.

ROCKING TRAYS.—No. 4257. "Improvements in Rocking Travs for Photographic and similar purposes." A. WHOWELL and A. A. WHITLEY.

MIRROR BOXES.—No. 4294. "Improvements in Mirror Boxes for Photographic Cameras." W. D. RICHMOND.

HAND CAMERAS.—No. 4366. "Improvements in or appertaining to Hand or Magazine Cameras." F. W. HUDLASS.

SCREEN KINETOSCOPY.—No. 4520. "Improvements in Apparatus for Photographing and Exhibiting so-called Animated Photographs." C. BECK and A. C. EDWARDS.

ROLLER-BLIND SHUTTER.—No. 4626. "The 'Archer Release' Time and Instantaneous Roller-blind Shutter for Photographic Lenses." Complete specification. G. HARTLEY.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

GERMAN LANTERN SLIDES.

To the EDITORS.

GENTLEMEN,—I note with regret the report of a somewhat severe vote of censure passed by the London and Provincial Photographic Association on certain German slides recently there exhibited. Whatever may have been the quality of the slides, I doubt the wisdom and the courtesy of dealing with them in this manner; and my slight knowledge of "foreigners" leads me to think that, had similar British slides been shown in Germany, their reception would have been different, and, at worst, the comment would have been confined to the exhibition room.

As my own name was mentioned in the matter, perhaps I may be allowed to say that my responsibility ended with the sending to yourself and other editors an offer which I was asked to make public, and dispatching the slides to those societies from which responses were received. Delays in transit, and my own absence from London prevented my seeing the slides (in fact, I have not yet seen them), but even had I examined them, and formed an opinion similar to that of the London and Provincial Photographic Association, I should not have been justified in refusing to forward the slides to the societies by which they had been booked.

The gentlemen who sent these slides in all good faith bear honoured names in the photographic world, and I can but again regret that their work should have been treated with such scant courtesy.—I am, yours, &c.,

H. SNOWDEN WARD.

March 1, 1897.

"THE SOUL OF TRADE."

To the EDITORS.

GENTLEMEN,—The statements contained in Mr. Thomas Mills's letter in your issue of the 26th inst. concerning myself are so very wide of the mark, that in justice I am compelled to trespass upon your space and kindness yet once more, and I promise it shall be the last, whatever follows:—

With regard to "taking portraits for nothing," I plead guilty, and admire Mr. Mills's patience and perseverance in search of the following (I give the facts). *Ten years ago* (just as I opened my business), to give the lie to certain false statements that were being circulated in the hope of injuring my prospects, I invited a number of well-known residents to sit for their portraits, for exhibition in my show-cases, &c., *for the first and only time in my life* (it seems absurd to be obliged to defend such an action after ten years).

Again, your correspondent has sent you a copy of my advertisement of an enlargement for 5*s.* 6*d.*; this is such a gross effort to misrepresent the facts that it is hard to express one's self in cold ink. The following is the truth concerning this: The portrait referred to is that of a celebrated preacher, now deceased; it is a 12 × 10, printed in bromide, mounted on 18 × 14 India tint, and spotted, published price 5*s.* 6*d.* unframed, selling all over Wales; orders on hand now reach 180 copies. Is this cutting the price, gentlemen?

After these explanations you will not be surprised when I say I know nothing whatever about the "3*d.* contract;" perhaps some other offender is here referred to.

The other points are too trivial to be noted further than to say that Mr. Mills is at least true when he says that small cities sometimes contain small minds (I was brought up in London).

Upper Bangor, February 26, 1897. JOHN WICKENS.

PHOTOGRAPHING BEAUTY.

To the EDITORS.

GENTLEMEN,—The article on beauty interested me deeply, because it is a branch that I have been attempting. I am an actress, and spend what little spare time I have in photographing my sisters of the stage, but what frightful results I get! Their complexions in real life are not like those of females who have never contaminated their skins with cosmetics. Veils, too, are ruinous to a good complexion. I am unable to retouch, so I will leave you to judge what my sitters look like in the "raw" state. Fine feathers verily make fine birds. Genuine beauty is indeed, however it may seem out of place for me to say it, not generally to be found on the stage. There are, as Mr. Penlake says, *some* good-looking girls on the stage; thank goodness they are not so ugly as those facing page 40 of *Anthony's Annual* for 1895. Did you ever see such coarse-looking creatures? Opinions, as your correspondent says, differ—very widely too—and I shouldn't wonder but what there are some people who would call those alluded to good-looking. Mr. Penlake is rather hard on tight lacing. Does he not know it has its good points? The general public admire a small waist. When stays were made of buckram and iron, people might have good cause to write against them; but look at the beautiful French corsets now worn, they are quite a different article of dress. Besides, even in the last century, when stays were made so stiff and cut so straight, ladies enjoyed good health, and were even more robust than those of the present day. Again, there are actually more women in the kingdom than men, which would not be the case if, during so many years, tight lacing had really been the "suicide" it has been called. I have often thought it hard that, if a young lady faints or dies suddenly, she should at once be accused of having brought it on by tight lacing. Do men ever faint or die suddenly? and are they not subject to consumption, spinal deformities, and those other diseases which have been ascribed to the corsets? For my own part, I have never suffered, and my waist is smaller than the majority. If the corset is carefully fitted, and plenty of room allowed round the upper part of the chest, no inconvenience need be caused. Can we be blamed for doing our best to please? All admire a slender figure; and can it be expected that any one will voluntarily make a "wall-flower" of herself, because those to whom fashion is no longer an object of concern rake up old-fashioned prejudices against the most attractive element of female beauty, and—excuse me Mr. Editor, I thought I was writing to a ladies' paper.* This is not photography, is it? Never mind, now I have written it I will send it with the hope that we "shan't be long" before we have Mr. Penlake's promised instalment on children and old age.—I am, yours, &c.,

Maidstone, March 1, 1897. ACTRO-PHOTO.

* [So did we.—EDS.]

To the EDITORS.

GENTLEMEN,—I am glad to see you are giving us a little something out of the ordinary run of things. The article on beauty is one that interested me deeply, for I once invited a few actresses to my place for the purpose of obtaining a few negatives; but never again, Oh, never again! They may be good at posing, but, unless an expert retoucher handles the negatives, the prints are not fit to see. Beauty is to be found in the country highways and hedges, and rarely on the stage. I should like to ask what county or town does the writer consider produces the most perfect beauty. Hoping soon to see the promised further articles treating of other periods of life,—I am, yours, &c., H. W. SMITH.

Woolwich-road, Charlton, March 1, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

E. S. HODGSON.—Many thanks; we have utilised.

CANADA.—Thanks; we refer to the matter elsewhere.

C. F. WYNNE.—The address is 26, Calthorpe-street, Grays Inn-road, W.C.

W. CONDOR.—Yes, there are, we believe, such firms; you had better advertise your requirements.

SCOTIA.—We are unable to recommend a teacher. Mr. Hepworth's *Book of the Lan ern* gives much information on the subject.

R. E.—You omitted your name and address; hence, according to our rules your question found its way into our waste-paper basket.

SCOTT'S SINGLE SLIDES.—W. G. DAVIES. Scott's single dark slides are, we believe, sold by W. I. Chadwick, St. Mary's-street, Manchester.

CRITIC.—The address is John Ruskin, Brantwood, Coniston. We believe he is D.C.L., but you had better consult some such work as *Men of the Time*, which, doubtless, gives particulars.

DEVELOPING.—CARLTON HILL. 1. Four parts of hydroquinone to three of metol. 2. Yes, grains or minims. 3. We do not read it that, in the experiments recorded, a fresh bath for each plate is required.

"AN AMATEUR'S STATUS."—BINDER says: "A local optician wishes to purchase some lantern slides of my making. He assures me that in selling them I in no way jeopardise my position as an amateur—that it is a recognised thing for amateurs to sell their work, *e.g.*, at photographic shows, &c. Your opinion on the matter will oblige."—In reply: The "status" of an amateur photographer is altogether an indefinable affair. By all means sell your slides, and don't trouble yourself further.

STEREOSCOPIC PHOTOGRAPHY.—C. H. OFFORD.—1. We should recommend a method of separating the lenses, as the command thereby obtained over the photography of near and distant objects will often be found of great practical advantage. Donnadieu's book on stereoscopic photography, published by Gauthier-Villars, of Paris, is worth adding to your collection; it is the best book on the subject published. 2. We do not know the camera named. 3. You would have to have the front specially made; we know of nobody who sells them. 4. A pair of rectilinears by the maker named will answer better; four-and-a-half inch or four-inch focus is decidedly to be preferred to five-inch.

GELATINE PAPER.—A. HUNT writes: "I am rather anxious to secure a greeny-black tone on the gelatine-matt surface paper, same as that shown by some of the leading photographers, and would ask if you would kindly favour me with any information as to this. I might say that I have tried toning with the acetate gold bath, followed with the chloride-platinite, and have only been able to secure a grey tone like platinotype?"—Commercial matt papers are not all alike, and what treatment will suit one to get certain tones will not do with another. We should advise our correspondent to communicate with the makers of the paper he uses, saying the tone he desires, and they will, doubtless, tell him how to get it.

SILVERING MIRRORS.—F. W. B. asks: "Could you kindly advise on the following:—I have been experimenting with 'Martin's' method for silvering mirrors, as given in the ALMANAC. So far I have only been able to get a brown deposit on the plate instead of the bright metallic silver. What I desire to know is what I am to do to alter this and so obtain my object?"—The result should not be a brown deposit, though it will not be a very bright one till polished. If the deposit is tolerably bright, polish it with fine rouge on a pledget of washleather. The solution, as well as the temperature of the room in which the operation is performed, should be pretty warm. Possibly this was not the case, so that may account for the "brown deposit."

STUDIO.—ROGO says: "I must apologise for trespassing so much on your time and space. I am sorry my former sketch was not clear. I enclose a second herewith. In the floor plan, A is the proposed studio, 25 × 14 feet; B, an adjoining building 17 feet long, thus leaving only 8 feet of side light possible. At C, 20 feet away, another building rises same height as A. I should have mentioned that both buildings are two-story. The perspective sketch may explain more clearly the position of A and B with regard to each other. In it the possible side light is C, D, E, F, or a space 8 × 7 feet. The studio would be used mainly for single figures, but groups up to four would be sometimes needed. Thanking you for your kindness."—This sketch makes the subject more clear. The light must necessarily be somewhat broken up, and we should advise the top light, of which there is plenty available, being increased a couple of feet or so.

BLUE TRANSPARENCIES.—W. & CO. write: "Can you help us in a little matter, as under? We fancy somewhere have appeared full instructions for making transparencies or negatives in *blue*, as per enclosed spoiled 'blue process print.' Only the subjects are to be on 'glass' and fine grain, or no grain at all, to bear magnifying. Some of the processes tried blue the film all over (whites as well as blacks). Only the reduced silver is required of the blue tint. A deep, nearly indigo, colour is what is wanted; with clear whites, pure white."—In reply: Sorry we are unable to break through our rule of not answering through the post, and if we did it would be impracticable to answer by return. The only process we know that will fulfil our correspondent's conditions is the carbon process, using a tissue made with either indigo or Prussian blue as the pigment, according to the tint desired. Some few years ago we saw some very fine slides made in that way, the pigment being Prussian blue.

STUDIO.—E. says: "Will you kindly favour me with your advice on the following query? I am having a portable studio built (on wheels), and am undecided what system of blinds to adopt. The main portion of studio is 11 feet long, 7 feet wide, 7 feet 6 inches to eaves, and 1 foot 3 inches to ridge. The roof is shaped thus: 2 feet at top and side are boarded, and there is glass in side and roof 8 feet long, and then 1 feet boarded; then there is an extension of 6 feet. Glass is to be rolled plate. Should the roof blinds slide backward and forward close to glass, or say slightly thin, or be on rollers? If on rollers, what would be the best width? also, what would be the best colour (as glass is frosted), white or light grey? Blue, I presume, would be too heavy. What colour do our leading professionals favour for the studio walls?"—For this size studio the roof blinds may slide backward and forward close to the glass. The colour should depend upon the aspect of the studio. If sun has to be stopped out, blue may be used with advantage. Any quiet subdued colour will answer, such as French grey or light green. We may remark that the studio will be very circumscribed as to dimensions.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1923. Vol. XLIV.—MARCH 12, 1897.

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EX CATHEDRÂ.

Messrs. W. F. Sedgwick, Limited, of 237 and 236, Blackfriars-road, S.E., send us a print from a half-tone copper block of their engraving, the subject being a recent photograph of the Queen by Messrs. W. & D. Downey. We learn that Her Majesty was so pleased with the reproduction that she purchased a copy of it, this being, it is believed, the first occasion on which the Sovereign has directly patronised the half-tone process. We are not surprised at the Queen evincing a desire to possess the reproduction, for not only is the original portrait an excellent one, but Messrs. Sedgwick's engraved block and the prints therefrom do the half-tone process a degree of justice as great as it is rare.

* * *

We learn that, on Thursday, March 18, there will take place at the Boar-lane Restaurant, Leeds, at 6.30 p.m., a meeting of the delegates of Yorkshire and Lancashire photographic societies affiliated to the Royal Photographic Society. At 7.30, the meeting will be thrown open to secretaries of societies not affiliated, as well as to other photographers. Mr. R. Child Bayley is to be present at the meeting, the object of which is to induce northern photographic societies, not yet affiliated to the Royal Photographic Society, to become so.

* * *

The interest we have always taken in copyright matters as affecting photographers, as well as in the progress of the Photographic Copyright Union, has brought us a copy of some correspondence between a member of the latter body and a firm who, it was alleged, had infringed the former's copyright. The firm, it may be mentioned, had copied and reproduced a photographic Christmas card for a customer, and the author of the original photograph, becoming aware of this, wrote the following letter to the printers:—

"It has come to my knowledge that you supplied to Mr. ——— Christmas cards on which was a reproduction of my copyright picture of ———. The reproduction is a very bad one, and the distribution of these cards in this district, where the picture is well known to be by me, is likely to do me an injury. I must ask you to give me full particulars of the order executed, and to send me immediately any block or copies there may be in your possession, with a cheque covering the amount of the order and, in addition, 20*l.* damages; otherwise, I shall immediately put the case into the hands of the Photographic Copyright Union."

* * *

Correspondence then ensued, and the photographer was requested to furnish the date of registration of the photograph. This information was not forthcoming. It was also suggested by the firm of printers that matters might be arranged between the photographer and the gentleman who had given the order for the reproduction of the photograph. To this suggestion the photographer replied: "In reply to your letter, I beg to inform you that no further communication has passed between Mr. ——— and myself. No action of Mr. ——— affects what you have done in infringing my copyright, for, as you are equally as liable as himself, and constantly dealing with such work, you should have your eyes open. In doubtful cases such as this could easily have been seen to be, you should have made further inquiries. However, I do not wish to be vindictive, or have further trouble in the matter; I have reconsidered my claim, and will accept 5*l.* and surrender of blocks or any copies you may have in your possession, in settlement of the matter."

The next step of the firm of printers was to consult their solicitors, who thus wrote the photographer :—

"Our clients have laid before us a copy of the correspondence which has passed between you with reference to an alleged infringement by them of your copyright of a picture [photograph]. You have been requested to furnish the date of the registration of the picture, but you have not done so. A careful search has also been made at Stationers' Hall without finding that the picture has been registered. It is therefore not unreasonable to infer that it has not. You must be perfectly well aware that you are not entitled to make a claim for damages unless your picture is registered. Your letter, therefore, ought never to have been written. Our clients are willing to take a lenient view of your conduct provided you apologise for your letter, and pay the sum of 3*l.* 3*s.* to reimburse them the costs they have been put to in consequence of it."

* * *

There was some further correspondence, but the matter has been allowed to drop. The case is one which has several points of interest in connexion with photographic copyright. In the first place we must express surprise that a member of the Copyright Union should have neglected to register the photograph that forms the subject of the dispute—a photograph, by the way, which is very well known to us and to many of our readers, and which is so good that we should have assumed its registration as a matter of course. Again, the claim for damages, &c. in the absence of legal title, which registration supplies, was surely a mistake of which the firm of printers very fairly took advantage. The only other further comment we feel called upon to make is that membership of the Photographic Copyright Union should at least carry with it a knowledge of the provisions of the Copyright Act, which appears to have been lacking in this case.

* * *

According to the *West Briton and Cornwall Advertiser*, of March 4, "Mr. Wallace Bennetto, of Newquay, has just returned from London, where he has given an exhibition of his pictures, obtained by his process of colour photography, before the Royal *(sic)* Society of Arts. The hall of the Royal Society was on Wednesday crowded to excess by members, who were anxious to see the results of the new process of obtaining coloured photographs. Mr. Bennetto's pictures were admitted to be far and away the best of the kind that had ever been shown. His landscapes and seascapes, with the setting sun, were pronounced to be exquisite, and several admirers said they must visit the scene from which such lovely views had been taken. Mr. Bennetto has been invited to a banquet, to be given in his honour, by the Royal Photographic Society, next week." We assure our Cornish contemporary that the Royal Photographic Society is not likely to have done anything so absurd as to invite Mr. Bennetto to a banquet.

* * *

We congratulate the Committee of the Camera Club on the following sensible announcement, which is published in the last number of the Club's *Journal*: "For some time past the right of publication or translation of anything appearing in the Club's *Journal* has been reserved, but the Committee have recently, after careful consideration of the subject, decided to abolish this reservation. From time to time, some gentlemen may deliver lectures at the Club, or contribute articles to the *Journal*, and may desire to reserve the copyright, and a statement to that effect will be inserted in the Number in which the report of the lecture or the article appears, but in all other cases the Press will, for the future, be free to publish or translate anything contained in our pages."

* * *

The removal of this restriction, which we have always held has operated adversely to the interests of the Club, is a wise act which we are confident will soon justify itself, through the increased success the Club will probably trace to the greater publicity thus given to its proceedings.

* * *

Messrs. Romeike & Curtice, of 359, Strand, have organized an additional department to their well-known press cutting business, which will be of special interest to photographers. This is an index and registry of copyright photographs and reproductions. They undertake to forward to subscribers lists of reproduced photographs. The staff of Messrs. Romeike & Curtice's art department will superintend the preparation and keeping up to date of albums of photographs, collated and indexed so that they can be easily found. Side by side will be albums of their reproductions, cut from newspapers, magazines, periodicals, &c. These will be always open to the use of subscribers during business hours of each day.

A NOTE ON LENSES FOR ENLARGING.

It is customary to tell the non-professional photographer that, in enlarging by artificial light, the lens most suitable for employment as the objective is the one with which the negative was taken, the primary condition involved being that the lens shall be able to cover the negative from which the enlargement is to be made. Theoretically, the doctrine is sound enough; but there are, we think, cases in which the theory, when reduced to practice, breaks down.

If we consider that the use of a condenser is to gather up rays from the source of illumination, which would otherwise diverge and be lost, and to bend them so that they are transmitted through the negative to the anterior combination of the objective, whence they are carried on to the screen or sensitive surface, it is difficult at first sight to understand that there can be any practical imperfection in the system. Having, however, recently been the recipients of complaints that with the lenses ordinarily in use satisfactory results, as regards the volume of light transmitted, cannot sometimes be obtained, we determined, by means of a few experiments, to ascertain how far these complaints could be traceable to the objectives themselves

The condenser transmits through the negative a cone of light, the point of which is, or should be, taken up by the anterior surface of the objective. But this presupposes that the latter is sufficiently large in diameter for the purpose, otherwise considerable loss of light is bound to ensue. The lens for enlarging must, in fact, act to some extent as a condenser of the cone of light transmitted by the primary condenser.

Practical trial of several lenses that had been complained of was made. These, we may say, were approximately of short focal length, that is, between five and six inches, while, when it is said that they were of the newer forms recently introduced,

it will be understood that the diameters of the glasses were small. Employing the full apertures, and focussing a disc on to a lantern screen, it was found that a clear and colourless circle could not in any case be obtained, so that a considerable percentage of effective light was cut off.

Several lenses of the rectilinear form, and approximately of the same aperture, though of slightly longer focus, were next tried, with the result that the projected discs were more brilliant than those first obtained, but in these cases, it is to be noted, the diameters of the glasses were also greater. The plan of interposing simple negative or positive lenses between the negative and the anterior surface of the enlarging lens was then adopted, but not with results of a very encouraging nature. It need hardly be said, perhaps, that the adjustments of the relative positions of light, condenser, negative, and lens were varied so as to get the best possible effect, but without imparting to the objective lenses of small diameter the power to transmit a perfect circle of light.

Adhering as far as possible to the same focal length as the lenses complained of, we next selected, as object-glasses, two or three lenses of the Petzval portrait form. With these lenses a perfect circle of brilliant illumination was obtained without any difficulty, and the slide, when placed *in situ* and focussed on to the sheet, was found, when the experiments were repeated with an actual projected image, to be more clearly and sharply defined with the portrait lens as the objective than with any of the other lenses in that position.

Let it be understood that the diameter of the glasses of a portrait lens confers upon it great light-grasping powers, constitutes it, as it were, a species of supplementary condenser as well as a projecting objective, and the reason for its superiority will be immediately apparent. It is instructive to temporarily remove the projecting lens from an artificial light-enlarging system. The cone of light passed through the negative will be seen to be of such a diameter that it is futile to expect lenses of short focus and very small diameter, such as those to which we have above referred, to transmit any but a small portion of it.

There are some interesting questions of theory involved in this point, to which we may take the opportunity of returning at a future time, but at present we are content to lay before our readers the practical deductions from the above-mentioned experiments, that the lens used for taking the negative is not necessarily the best to be employed for artificial light-enlarging in so far as light-transmitting powers are concerned. Where a short-focus lens is employed as an enlarging objective, the greater the diameter of the surface presented to the negative the better, and thus we arrive at the conclusion that, *cæteris paribus*, a portrait lens is not to be excelled for the purpose, and that lenses of very small diameter have inherent drawbacks which it is more than difficult to overcome. This may also be expressed by saying that the back focus of the projection lens should exceed the diameter of the condenser, and that the ratio of the diameter of the condenser to that of the objective should be small.

Photography and Astronomy.—Sir Robert Ball, Lowndean Professor of Astronomy at the Cambridge University, in a lecture last week at the Crystal Palace, paid a high tribute to photography. Referring to the advances made in astronomical science during the last sixty years, he said that photography had played an important part in that progress, and that more had been learned about the sun from the use of photographic plates than from any other means. It is needless to say that the lecture was illustrated with photographs upon the screen, which were highly appreciated by the audience.

Animated Photographs.—Every one who has seen the different "animated photographs," under whatever name they may be known, will readily admit that they, one and all, are open to improvement, more particularly in the direction of steadiness of the image when on the screen. Whether the thing will ever be rendered perfect or not remains to be seen. If it is not, it will not be the fault of many enterprising inventors, as the records of the Patent Office testify. Last week alone no less than five specifications of patents were published in connexion with apparatus for taking and exhibiting pictures of moving objects. Amongst the number we notice one by Mr. Friese-Greene. This gentleman was one of the first, if not the first, who gave attention to the subject.

State Aid towards Röntgen Work.—It is stated that a sum of 50,000 marks is appropriated to the Ministry of Public Instruction of Prussia to assist certain public institutions and private individuals in obtaining the necessary apparatus for investigations with Röntgen rays. Part of the sum is allotted for the purchase of instruments, the other part towards the cost of working. According to the same source, such a set of apparatus costs, in Germany, a sum equal to about 125*l*.

A New Kind of Ray.—According to reports from Vienna, Professor E. Friedrich, of Elbing, Prussia, has informed the Academy of Science of the former city that he has discovered a new kind of ray, which he terms Kritikstrahlen, or critical rays, which "are so sharp that they go through the body almost in a moment," and produce pictures which vary according to whether the body be alive or dead. Photographs of living hands show the bones in the accustomed X-ray manner, but, if the hand be dead, the flesh photographs, and the bones do not show. This news, if true, ought to be as balm to those people who have such a terrible fear of being buried alive, an event the occurrence of which is doubted by many.

Theoretical Aspects of Röntgen Rays.—According to *Nature*, Dr. Julius Pretch, of Heidelberg, has just published an important thesis on the cathodic rays, Röntgen rays, and other radiations emanating from vacuum tubes. Besides the rays capable of being deflected by a magnet, according to the law of Biot and Savart (which the author has verified by photography), Röntgen's Goldstein's, and Lenard's rays are shown to be distinguishable by their chemical and photographic effects. Dr. Precht considers that a portion of the radiation from a discharged tube is not a wave motion, because the absorption of the rays in passing through paper varies with the time of duration of the radiation. Interference phenomena were obtained with direct and reflected Röntgen rays (a fact which will surprise many, owing to the general belief that Röntgen rays can be neither reflected nor refracted). Calculating from these phenomena, their wave-lengths were found to vary between 370×10^{-6} to 830×10^{-6} mm. From the fact that transverse light waves of this length cannot pass through black paper, Dr. Precht is inclined to accept the theory of longitudinal waves. By interference experiments such as these, wave-lengths were obtained from two to four times as great as those found by Voller in observing the diffraction produced through a slit.

The Future of Acetylene.—Two or three weeks ago we commented upon the number of patents that had been applied for during the past year or so in connexion with acetylene, its production, applications, also for improvements in the manufacture of sulphide of calcium. We now have an idea that the recent concerted action by insurance companies, and the new Order in Council as to the storage of the calcium carbide, and the licence required for the purpose, will considerably discount the commercial value of the

patents. In view of this, we shall not be surprised to find that some of the applications are not proceeded further with. One of our contemporaries mildly hinted a little while ago that we have given too great a prominence to the fatal accidents that have occurred with acetylene. Be that as it may, the insurance companies, as well as the Home Office, consider that some restrictions with regard to it are necessary. Acetylene and the calcium carbide from which it is generated are perfectly safe things in the hands of careful people who understand their properties; but it is the ignorant and careless that cause the accidents, and it is these that the insurance companies and the Legislature have to look after. Petroleum and petroleum spirits are perfectly safe in the hands of those who are careful and know their characteristics; yet how many accidents are there weekly with paraffin and spirit lamps?

The Photographing of Ripples.—A very interesting paper under this title was read at the last meeting of the Physical Society by Mr. J. H. Vincent. Ripples of various sizes, from those of plain visibility to others of microscopic dimensions, were photographed, and the results bore striking analogies to the theoretical explanations of various optical phenomena. The minute wavelets of over 200 per second frequency were photographed by an electric spark, whose duration was about one two-hundred-thousandth part of a second, and were produced by a stylus attached to a turning fork. In a photograph of waves caused by two styluses attached to one prong, dark lines were seen to radiate from the region between the centres of oscillation; these are the lines of minimum disturbance hyperbolas, and the photograph illustrates interference in a manner similar to Messrs. Fresnil and Young's "interference" experiments optically produced. Other photographs from waves produced in different manners gave similar results to the optical work on interference and diffraction by various experimenters—Meslin, Lloyd, and others. Other photographs, again, gave analogues of "spherical aberration" and "forced vibration." Mr. Boys, congratulating Mr. Vincent upon his results, said they would be found to present analogues of the greatest service in demonstrating the phenomena of acoustics and optics, and that such photographs were far better than geometrical pictures drawn by instruments.

Another Copyright Action.—On Friday last a case, Brooks *v.* The Religious Tract Society, was heard in the Chancery Court for infringement of copyright. Although the case had nothing to do with photography, a question that has frequently been put to us was involved. It was whether a copy of a picture with certain details altered was an infringement of copyright. The plaintiff is the owner of the copyright in a well-known engraving of Mr. Holmes's picture, *Can't You Talk?* The defendants had issued a woodcut in the *Child's Companion* which incorporated the figure of the dog and other details of the plaintiff's copyright work, but in place of the child were two cats and a tortoise. Another feature of both works was a kitten peering through a door. An interim injunction was sought, and it was agreed that the hearing of the application should be the final trial of the action. The plaintiff did not ask for damages, and the defendants had offered an undertaking. The point for argument, however, was whether there was sufficient imitation to constitute an infringement of the Copyright Acts. The Judge (Mr. Justice Romer) held that the principal figure, the dog, together with a variety of other details, were copied in the defendants' woodcut, and that the sentiment or idea of the plaintiff's work had been taken and copied. He added that the defendants had, no doubt, acted inadvertently, and he accepted their undertaking, but they must pay the costs. In the case of Hanfstaengl *v.* the Empire Theatre, which was referred to during the hearing of this case, it was held that, although the living pictures were not an infringement of copyright, there was infringement in the case of some of the backgrounds, which had been copied from the plaintiff's pictures.

A Comparison of Lantern Illuminants.—A writer in the *English Mechanic* (E. R. P.) gives an account of a series of experiments he has made to determine the relative value of three light sources—acetylene, Welsbach burner, paraffin lamp—for lantern work. The paraffin lamp employed was that supplied with a well-known and advertised optical lantern. The best crystal oil procurable was used, and the wicks carefully dried and trimmed before use. The Welsbach burner was the usual pattern fitted with a silver reflector, the acetylene burner was fitted with two Bray's burners, No. 00000, about three-quarters of an inch apart, one at right angles to the other. Comparing the Welsbach and acetylene, the picture with the latter was the brighter, though that with the Welsbach was purer and whiter. The disc without picture gave the Welsbach fainter, though decidedly more evenly illuminated. Taking the distance of the lanterns from the screens to give equal illuminations, and making the necessary calculations if the acetylene was called 1, the Welsbach was ·77 (nearly); if the burners alone, without lantern, the relative screen brightness was as 1 to ·65. Taking the acetylene and paraffin flames, the latter gave the more even illumination, but with a much yellower colour. The paraffin lamp gave a clear, warm-tinted picture, the acetylene much superior in every respect, equivalent to the difference between objects lighted by fire light and by day light—proportional brightness of discs 1 to ·88. Comparison of Welsbach and paraffin: the remarkable whiteness of the form was well demonstrated, and, when slides were placed in the lantern, they, on this account, showed up quite as well despite their inferior intensity of illumination. Relative light intensities, 1 to ·74. The impression left on the writer's mind was that acetylene is decidedly the best second-class lantern illuminant yet out, both as to purity and intensity of light. Its safety and manageability were distinct questions about which he might have something to say later on.

The Society for the Protection of Ancient Buildings and Exeter Cathedral.—If the report that appeared in the daily press last week be correct, the Society has received a direct "snub" from the Dean and Chapter of Exeter. It seems that the Committee wrote to the Dean, asking what was being done with respect to the repair of the west front of the Cathedral. Canon Edwards, in the absence of the Dean, has written that the Chapter "do not wish to be brought into relations with your Society in the matter of what we are doing at the west front of the Cathedral." Evidently the Dean and Chapter of Exeter have in mind the acrimonious discussion there was between the Society, seconded by that of the Antiquaries, and the Dean and Chapter of Peterborough a little time back, and they do not mean to be drawn into a similar one with regard to Exeter Cathedral. Possibly they feel the more justified in this step, for it seems that, as the work at Peterborough proceeds, the authorities there were quite right in doing what their architects considered absolutely necessary for the safety of the structure. The west front of Exeter Cathedral is a fine piece of architecture, and it is to be hoped it will not suffer at the hands of the repairers or restorers. As we said with the west front of Peterborough Cathedral, so we repeat with Exeter, namely, that there are scores of photographs of the front which will rise in judgment against the architects if they deviate from the original.

While on the subject of restorations, it may be mentioned that the Restoration Committee have decided to proceed at once with restoring the lady chapel of St. Bartholomew the Great, Smithfield. This church, although the oldest in the City, and we think the oldest in London—it having escaped the great fire of London—seems to be but little known to the ordinary Londoner. Its restoration has been proceeding piecemeal, owing to lack of funds, for some years past. Only a few years back a portion of the church was used as a blacksmith's forge. So far as the restoration of this antiquated building has gone, we have heard no grave complaints from antiquarians as to the way the work has been carried out. Any one is allowed to photograph the interior for a small fee, which goes to the restoration fund. The interior of the church is not easy to photograph, owing to the feeble light from the sides, the chief light being from the east window. The best time is in the afternoon when the sun is towards the west, and it is imperative that the plates used be backed to avoid halation.

By the way, in Cloth Fair, from which there is an entrance to the urch, are some very old and picturesque houses, some of which are tween two and three hundred years old, and are of great tiquarian interest. Some are, however, coming down for the storation of the Lady Chapel, and probably the others will soon llow to make room for buildings more suitable to modern City quirements. Hence, those who wish to secure photographs of em should lose no time in the matter.

BY THE WAY.

OLOUR photography—or, to speak more by the book, photography natural colours—appears to be just now enjoying one of its eriodical booms, but what will be the result of this *fin-de-siècle* emonstration remains as yet an unsolved problem. I remember ery well, to go no further back, the "revival" of photography in olours that was attempted nearly twenty years ago, when the rocess, pioneered and prospected by the genial Lombardi, was all ne talk of the town, and was as usual regarded by the lay public a t last the solution of the great problem.

But Signor Lombardi was honest enough to claim no more for his ethod, which, if there be anything in a name—a fearsome name, it true—should have succeeded; for "poikilography" was nothing ore, and professed to be nothing more, than a glorified or improved crystoleum" process worked on a larger scale, and on canvas stead of glass. There was an exhibition of specimens at, I think, f I remember rightly, the Egyptian Hall, and I had the pleasure of eing personally conducted round the show by Signor Lombardi imself, and, of course, had the benefit of having my attention called o all the most remarkable examples of this undoubtedly practical ndustrial process. But, as I have said, it was only claimed for the rocess that it was a cheap method of producing or reproducing ictures in colour in which photography played but a subsidiary art, and in which much fell to the task of the painter if not to the rtist. Certainly the specimens produced, many of them of gigantic limensions, were really first-rate of their kind, and some of them alculated to pass as genuine oil paintings except to an expert.

Then, a decade later, we had two rival processes running simultaneously, one "engineered" by a syndicate, of which the unfortunate Mr. Parkes was the leading spirit; the other, by Mr. J. E. Mayall t one time, in the early "sixties," perhaps the leading West-end hotographer. But, I am sorry to say, the same spirit of openness was not exhibited in connexion with these two ventures as in the ase of "poikilography," for they were first described as photography n "natural" colours, which designation, only after much protest rom photographic quarters, was modified to "photography in olours," which was a description that might be, with equal justice, pplied to any mechanically coloured picture with a photographic basis.

Now, after another decade or so, we go on progressing and improving, both in quantity and quality, for we have *three* processes going at once, and all based, or claimed to be based, on distinctly scientific principles. But they differ in the respect that, whereas one—Mr. Ives's—has been fully and openly described and demonstrated in theory as well as in practice, the second, that of M. Chassagne, though the principle is so far kept secret, is freely and openly shown in working, and the results submitted to public examination; the third, Mr. Wallace Bennetto's, is still the subject of much apparently needless mystery, and the specimens, as well as all information concerning them, are carefully, and, shall I say, tenderly, hidden from the public gaze, as if the glare of scientific inquiry was calculated to scorch and jade their beauties, and reduce them to the level of the ordinary "coloured photograph."

Of the Ives's process from all accounts, for I have not seen his most recent examples, it seems there can be no doubt as to its being the most successful attempt yet made to imitate the colours of nature without the aid of the artist or the brush. It is, in fact, a thoroughly scientific, as well as successful, method of imitation, and claims to be no more, and, so far as I gather from published reports, does imitate nature in a truer, as well as more pleasing, manner than its rivals. Of the Chassagnes process little can as yet be said, except that, if the claims made for it be well based, it goes one step nearer the automatic imitation of nature's colours than has hitherto been done. But, so long as artificial pigments have to be used, even though the sensitive films may exercise the selective action claimed for them, it can only be an imitation process and an imperfect one, which possibly accounts for the weakness of the results so far produced. So far as the Bennettos method is concerned, the only opinion that can prevail is that the inventor's conduct alone is sufficient to bring suspicion upon it. I can quite understand his feeling nettled at the antagonistic criticisms that have appeared in connexion with it, but surely he has mainly himself to blame. And surely, again, is it not the case that the meeting the other evening, at the Society of Arts, afforded him a grand chance of "rounding" triumphantly upon his foes instead of going away at the earliest opportunity with his precious specimens "in a black bag——"

It is not surprising that scientific photographers should hesitate before blindly placing their belief in the pretty theory of "selective action," which, in imagination at any rate, is by no means new, as the anecdote I told last month shows, and which, moreover, has, I believe, formed part of more than one patent. But what does selective action, as applied to colour photography on M. Chassagne's lines, mean? It means the endowment of the ordinary silver negative image with properties that, in the present state of our chemical knowledge at any rate, it is impossible to believe in its possessing; it means that, while the ordinary sensitive film, even if rendered truly orthochromatic, is only capable of rendering the colours of nature in gradations of black and white or monochrome, the image so produced retains, or is endowed with, the power of retranslating those tonal values into colour values, in fact, of discriminating between mere light and shade or gradation and colour.

So far as light and shade are concerned, a certain amount of selective action is undoubtedly possible, and the principle was first applied in the collotype process by Mr. Ernest Edwards when he introduced the practice of rolling up the "transfer" or image with inks of different consistency, using a stiff ink for the shadows or softer part of the impression, and a thinner ink for the higher lights, which have been more completely hardened by the action of light. It is possible that, to some slight extent, this principle may be applied to colour work, using inks of different consistency and different colours applied in such order that the red ink, we will say, attaches itself to and "satisfies" the softer and least impressed portions of the surface, and the blue ink to the harder portions when a stronger action has taken place. But, though this may secure a certain blending of the primary colours, it can never, without the possession of a special *chromatic* selective power, result in a true colour-rendering, since the ordinary surface of bichromated gelatine can only discriminate between light and shade.

For instance, a light blue might be rendered in monochrome on an ordinary plate of precisely the same value as a degraded white, or a dark yellow might appear of precisely the same depth as a certain tint of neutral grey, or, indeed, any other colour. But, in rolling up or applying a coloured solution to a surface on which these respective "tones" are represented side by side what is to make the light blue appear any different from dirty white, or the dark yellow to distinguish itself from its corresponding equivalent in grey? It appears to me that the first colour applied, provided it has the power of adhering at all, would "take" equally upon blue and white and upon yellow and grey, simply because, in the absence of the special chromative selective power, they would be represented by identically similar conditions of film. Still it is possible that M. Chassagne's process may provide this special power; if so, I shall be glad to hear of his accepting Captain Abney's challenge, which seems to me to intentionally present this difficulty for his solution. At the same time the inferior quality of the results that have hitherto been shown do not necessarily condemn the principle of the process, for the want of correctness in the colour rendering may, and probably is, in any case, due to the use of unsuitable pigments, a difficulty that

will always surround the imitation of natural by means of artificial colours by whatever process or method attempted.

Following my remarks in my last communication on snow pictures and pretty negatives, I have had a letter from Mr. "Matthew Surface," enclosing a little print as a case in point from a negative, one of several, that he was about to throw away "because they did not exhibit the usual familiar qualities in the developer." These negatives were taken during the late frost, or, as he describes it, "in the dull, foggy atmosphere (thaw just beginning)," when "there were no high lights or deep darks, but every object was murky and ill-defined." The results are described as "poor, flat, detailless negatives," and he was about to throw them away. However, "caution and curiosity" led him to try their printing qualities, and he was agreeably surprised to find that he had secured "a true reproduction" of the scenes as he saw them. "The fog," he goes on to say, "was not due to any defective manipulation, but was nature's own fog reproduced with fidelity."

The print enclosed—which, appropriately enough, is a matt-surface one, mounted on a scrap of brown paper—certainly gives a very fair rendering of the subject under the conditions mentioned, though, to my mind, the effect is rather that of "atmosphere," as seen in a distant view, than of fog at close quarters; for the limit of vision is, I should judge, not more than a couple of hundred yards. In that distance, had it been fog, objects would have been entirely lost, alike invisible to the eye or the camera, instead of which they are defined with tolerable clearness, though very faintly, through over-development consequent on under-exposure. The hedgerow in the right foreground, except where flecked with patches of snow, and the nearest tree trunk are masses of "deep dark" quite free from any suspicion of fog; and the gradual softening away is rather that of distance ,aided, no doubt, by some slight mist, probably more visible to the eye than apparent in the picture—which, I repeat, does not to my eye convey the idea of fog, though it is a very effective rendering of atmosphere, and, like the examples quoted by me last month, is not true to nature.

By the way, there is one point in which artists of snow and frost scenes, especially of the impressionist type, generally fail in securing a faithful rendering of the subject. Frost and snow, of all things, suggest "crispness," and in such subjects the "*f*-64 man," to use Mr. Maskell's term, finds his excuse. We want "ilka blade" of grass microscopically defined, and snow banks with the sparkle of crystalline sugar, rather than the rounded softness of heaps of flour. But how often do we see it? DOGBERRY.

RED SENSITIVE PLATES WITH CYANINE, CŒRULINE, AND NIGROSINE.

AT the suggestion of Dr. Eder, Herr Wilhelm Eckhardt has been investigating the relative sensitising action of the above-named red sensitising dyes, and gives in the *Photographische Correspondenz* his results.

He points out that it is already known that cœruline sensitises gelatino-bromide of silver for red, even up to Frauenhofer line A; whilst, with nigrosine B, three maxima of sensitiveness are obtained in the orange and red. Nigrosine B gives foggy plates, and cœruline is unstable and readily decomposed, unless the plates are quickly dried; and he therefore discovered that, if the plate was bathed in the dye, and then soaked in alcohol so as to remove the excess of dye from the gelatine, excellent results were obtained, as the alcohol merely removed the excess of dye from the gelatine, and not that which had combined with the silver bromide

CŒRULINE PLATES.

The cœruline S, obtained from Dr. Schuchardt, of Görlitz, sensitises plates with two distinct maxima—one in the red from A to C maximum between A and B), the second from $C\frac{1}{3}$ to D and slightly into the yellowish-green, with a maximum $C\frac{2}{3}$ to D.

The following formula gave the best results:—

Cœruline		2 parts.
Water	100	„
Ammonia		1 part.

The aqueous dye solution will keep for some days, but the dilu ammoniacal solution must be used at once.

The bromide plates were bathed in this solution for three to f minutes, allowed to drain, and then laid for three to four minute alcohol. The plate was then well drained, and allowed to dry blotting-paper. Development took place as usual, a small addit of bromide to the developer acting favourably.

NIGROSINE PLATES.

Nigrosine B, as obtained from the Farbenfabrik Elberfeld, vorm Beyer & Co., surpassed the cœruline about three times in red sen tising; but such plates require much more careful handling. T nigrosine plates gave three sensitising maxima. The first, v strong, begins before A, and rises and falls sharply; the second l at C; and the third, $C\frac{1}{3}$ D, stretching slightly beyond D, with maximum at $C\frac{2}{3}$ D.

The aqueous solution 1 : 500 will keep for about two weeks, a the following was used:—

Nigrosine B (1 : 500)		10 parts.
Water	100	„
Ammonia		1 part.

A smaller proportion of dye lessens the red sensitiveness, whilst greater does not increase it. More ammonia increases the sensitiv ness, but leads to fog.

The above solution was filtered before use and immediately use The bathing of the plates and treatment with alcohol was exactl the same as with the cœruline plates, but the dish with the alcoh must be more energetically rocked. The plates may be expose damp, and when dyed they will keep for about eight days.

SENSITOMETER EXPERIMENTS WITH VARIOUS RED SENSITIVE PLATES.

Experiments were made with Scheiner's Universal Sensitometer on the influence of the dyes on the general sensitiveness of th plates. This was done in order to determine whether the relativ red sensitiveness of the plate was increased; but the general sensi tiveness more or less decreased, as is the case with cyanine plates The undyed silver bromide emulsion, as well as an eosine-bathe plate, was used for comparison. The eosine plate was prepared b immersion for from three to four minutes in eosine solution (1 : 500) 3 parts; water, 100 parts; ammonia, 1 part; and then dried, as pre viously described, with alcohol. Cyanine plates, prepared accordin to Weissenberger's method, and some bathed in cyanine-bora solution, were tried:—

1. Cyanine (1 : 500)		0·2	parts.
Water	100		„
Acetic acid		1	drop.
2. Cold saturated borax solution	100		parts.
Cyanine (1 : 500)		1	drop.

Bathe for five minutes, wash, and dry.

The following shows the relative sensitiveness to a benzine light:—

Ordinary bromide plate	1
Eosine	1·6
Cyanine and acetic acid	$\frac{1}{10}$
Cyanine and borax	$\frac{1}{30}$
Cœruline S	$\frac{1}{5}$
Nigrosine B	$\frac{1}{15}$

From this it will be seen that eosine increases the general sensitiveness, whilst cœruline and nigrosine, if only slightly, lower it; very striking is the loss in general sensitiveness in using cyanine.

SENSITOMETRIC EXPERIMENTS WITH VARIOUS RED SENSITIVE PLATES.

As it is important for three-colour printing to determine the relative sensitiveness and various plates behind various screens, a series of sensitometric tests was made by placing a blue, red, and green screen between the light and plate. For this purpose, Carbutt's three-coloured screens were used, as they give a deep red (from A to $C\frac{1}{2}$ D), a tolerably pure green (from D to $E\frac{3}{4}$ F), and a blue violet (from F to H). Particular mention is made of the

creens used, because different sorts of plates show great variations i sensitiveness, according to the nature of the light filters. The llowing table shows the relative sensitiveness of the bathed plates ehind the above-mentioned light filters :—

	Blue.	Green.	Red.
Ordinary bromide plate	$\frac{1}{77}$	$\frac{1}{175}$	—
Eosine	$\frac{1}{77}$	$\frac{1}{84}$	—
Cyanine and acetic acid	$\frac{1}{107}$	—	trace.
Cyanine and borax	$\frac{1}{210}$	—	trace.
Cœruline S	$\frac{1}{13}$	$\frac{1}{176}$	$\frac{1}{343}$
Nigrosine B	$\frac{1}{10}$	$\frac{1}{137}$	$\frac{1}{102}$

From this table it will be seen that the insertion of the blue reen reduces the action of the light to one-eighth, and the eosine late shows the same sensitiveness to blue light as the undyed plate, nd that the nigrosine and cœruline plates have markedly suffered, ven if not considerably, in sensitiveness to blue light. The cyanine late had, on the other hand, become considerably less sensitive. he eosine plate showed, as was to be expected, the greatest green nsitiveness, but required always an exposure eleven times longer an the ordinary plate behind the blue screen. In red sensitiveness ie nigrosine plate has surpassed all others, as, by the use of the enzine light, the time of exposure behind the red screen was only irteen times longer than for the blue plate. The cyanine plate ave the worst results in these experiments, namely, scarcely a trace f an image, which may be explained by the fact that Carbutt's d screen, strongly cuts off the yellow and orange, so that ie orange sensitiveness of the cyanine plate cannot come into play. he cyanine plate cannot therefore be used for such filters; only hen the preparation of the cyanine plate is such that the second aximum of sensitising near A appears will a photographic action e obtained behind a dark red screen, and then such negatives are, as rule, wanting in strength.

Altered Behaviour of Sensitised Plates with Electric Light.

When the relative sensitiveness of the above-described plates ehind the light filters had been determined by the benzine light, nd it was considered desirable to copy oil paintings by the electric ght, the ratio was not found to hold good. The reason of this is at distribution of brightness with the benzine light is very ifferent to that with the electric light, thus the exposure behind ie red screen must be four times longer than was calculated with ie benzine light; the electric light is relatively much poorer in red ys and richer in blue light than the benzine light. The following ble gives the relative times of exposure with the electric light, for ny case which may occur in practice :—

	Filters.		
	Blue.	Green.	Red.
Ordinary plate	7·7	—	—
Eosine	—	60	—
Cœruline S	—	—	1300
Nigrosin B	—	—	400

From the above experiments it is shown that, to accurately etermine the capabilities of a dye for practical photographic use, ot only must the sensitising curve be taken into account, but also he action on the total sensitiveness, the transparency of the coloured lters for rays of definite wave-length and the quality of the light ource. These factors have now been determined by these experiments for the above dyes, and therefore may be used in practice.

FOREIGN NEWS AND NOTES.

Halation.—In the current issue of the *Bulletin de la Société Française*, M. Mussat gives some notes upon various backing aterials, and points out that M. Cornu used a mixture of essences nd resins with a black pigment which had the same refractive dex as the glass. This, according to M. Mussat, is the best, but it as considerable disadvantages for practical work in that it will not ry. M. Drouet has suggested a mixture of glycerine, dextrine, and red ochre, but this has either to be removed from the plate before development, or else there is great liability for the red ochre to adhere to the film during development. M. Mussat therefore tried the application of sheets of gelatine treated with glycerine, which can be applied to the glass, and then stripped before development. His formula is :—

Water	100 parts.
Gelatine	15 „
Glycerine	12 „
Red ochre in fine powder	15 „

The gelatine should be soaked in the water and melted, and the other ingredients added, the whole well shaken, filtered through muslin, and then coated on a well-cleaned and talced glass, using 7 c. c. to every 100 sq. c. c. of surface. After fifteen minutes, the glass should be plunged into a five per cent. solution of formalineand left for fifteen minutes, and then washed and dried. The sheet of gelatine can now be cut up into the required sizes, and stripped, and squeegeed on to the back of the plate, using a mixture of—

Water	125 parts,
Gum arabic	75 „
Glycerine	12 „
Salicylic acid	0·5 „

to make it adhere. When the plate is placed in the developer, the backing will at once strip, and can be rinsed and put away for use. Another formula for larger sizes is :—

Meta-gelatine	100 parts.
Gelatine	0·80 „
Red ochre	30 „

The meta-gelatine is made by heating 12 parts of gelatine in 100 parts of water for some hours on a water bath. The above mixture can be applied with a pad of linen.

Yellow Screens.—Fleck states, in *Le Moniteur de la Photographie*, that the best yellow screen for erythrosine-sensitised plates is made by dissolving—

Acridine yellow	10 parts.
Alcohol	150 „

and—

Fuchsine	5 parts.
Alcohol	100 „

To a two per cent. raw collodion should be added twenty parts of the acridine yellow and seven to eight parts of the fuchsine solution.

Stripping Prints.—Frequently when enamelling gelatino-chloride prints by squeegeeing them on to glass, it is found that they will stick and refuse to strip. If the glass is placed flat on the table, and the back of the print rubbed over with formaline till quite saturated, and then allowed to dry, the print will readily strip.

Silvering Glass.—The following method of silvering glass is given in *Cosmos* :—

Silver nitrate	30 parts.
Ammonia	15 „
Distilled water	60 „
Oil of cassia	2 „
Alcohol	90 „

Dissolve the silver in the distilled water and add the ammonia ; allow to stand for twenty-four hours, and then add the cassia dissolved in the alcohol. Place the glass to be silvered in a horizontal position, and give it an edging of mastic, and flow the above solution over it till it is four or five mm. thick. In an hour a good thick film of silver will be formed, which can be washed in alcohol, dried in an oven, and varnished.

The Amateur's Sensitometer.—Behrens revives the old idea of using the stars as a sensitometer to compare the sensitiveness

of plates. He suggests setting up the camera and focussing the stars, and exposing the plates for four minutes, then capping the lens for a minute, and giving another four minutes' exposure with another stop, which should have the intensity of half the first, and so on, till four or five stops have been used. The two plates to be compared should be exposed one after the other, and interrupted star trails will be obtained of various strengths and numbers, and by superimposing the plates it will be easy to determine with which exposure the two plates are equal. Thus, assuming that No. 1 plate showed a star trail with *f*-25, whilst with No. 2 plate it only showed with *f*-12·5, then No. 1 plate would be four times as sensitive as No. 2.

Home-made Lantern Plates.—Eckhorst, in *Der Amateur Photograph*, recommends the following method of making lantern emulsion. Heat in a water bath to not above 50° C. the three following solutions:—

No. 1.

Heinrich's hard gelatine	5 grammes.
Distilled water	40 c.c.
Alcohol (40°)	10 „
Ammonium bromide	7 grammes.

No. 2.

Heinrich's hard gelatine	5 grammes.
Distilled water	40 c.c.
Alcohol (40°)	10 c.c.

No. 3.

Silver nitrate	11 grammes.
Distilled water	12 c.c.

Ammonia, *quant. suff.*, to dissolve the precipitate first formed. Solutions Nos. 2 and 3 are mixed together, and then in the dark room No. 1 is to be added, the emulsion well shaken, and poured out into a flat dish to set. It should then be cut up into strips, washed for eight to twelve hours in frequently changed water, collected on a filter, pressed, and dissolved at 50° C., and coated on glass in the ratio of 8 to 10 c.c. for a 13 × 18 cm. plate.

Testing Sodium Sulphite.—According to Chicandard, the most likely impurities in sodium sulphite are sulphates and carbonates. To test for the former, add a few drops of solution of barium chloride, and, if the resulting precipitate is not completely soluble in hydrochloric acid, sulphate is present. Phenol phthalein gives a red colour with the sulphite if carbonate is present.

Labels on Glass.—To write on glass, a mixture of two parts forty per cent. water-glass, and one part of caustic soda should be used with a steel pen, allowed to nearly dry, and then dusted with the desired colour, such as lamp-black, barium sulphate, &c.

PAPER NEGATIVES: AN OLD PROCESS REPATENTED.

Herr Oswald Moh, of 23, Augustastrasse, Görlitz, has patented what he terms, "An Improved Process for Making Photographic Negatives."

In photographic processes, he says, it has been heretofore customary to use permanently transparent supports for the surface sensitive to light, such as glass, celluloid, gelatine film, and the like. Such a method of procedure, is however, so far disadvantageous that the production of imperfections and marks at the back is not prevented. This last objection is occasioned by part of the light directed upon the plate passing through to the back of the latter and being reflected from it, the result being that the definition is less sharp, and imperfections and marks are produced upon the back. The present invention has for its object an improved process for making a support for the sensitive surface of photographic negatives, of such kind that it is opaque to light during the process of exposure to take the picture, whilst for printing from the negative the light can perfectly freely pass through it. Experiments have proved that for such purposes paper is a particularly good material, as by treating it with transparent oil before it is used for printing it becomes thoroughly transparent to light. A process of the kind described has also the very great advantage over the ordinary ones, that the use of backs of suitable wood or other like material is rendered quite unnecessary.

By making the support for the sensitive film transparent, the retouching of the negative can be done from the back, so that defects in the retouching can be corrected by the aid of indiarubber eraser or by means of etching gum.

By the use of an opaque support for the sensitive film all refraction and reflection of light is prevented.

Herr Moh claims:—

1. The improved photographic process in which, in order to render unnecessary wooden or other backs of the like kind, a support for the negative sensitive surface is used, which during exposure to obtain a picture is opaque to light, but for subsequent printing is rendered transparent.

2. A method of carrying out the process Claimed in claim 1, in which the support for the negative sensitive surface is formed of paper, which before being used for printing is rendered transparent by treating it with transparent oil.

[The use of paper as a support for negative purposes and the rendering of it translucent before being used for printing can scarcely be regarded as patentable. Surely Herr Moh, or his agents, have overlooked the fact that a dozen years ago the Eastman Photographic Materials Co. made a speciality of negative paper, which, before being used for printing, was rendered translucent. See our volumes for 1885 and 1886.—Ed.]

THE EVOLUTION OF THE TELESCOPE.

On February 24 Mr. H. Dennis Taylor lectured on the above subject before the British Astronomical Association. We are indebted to the *English Mechanic* for the following report:—

In the course of his lecture, Mr. Taylor said that the earliest known passages in the ancient authors which can be construed as hinting at something of the nature of a telescope—that is, an optical contrivance for causing remote objects to appear larger and nearer than to the unaided eye—occur first in the *Opus Magnum* and other works of Roger Bacon in the thirteenth century; then in the writings of Fracastorius, Leonard Digges, and Baptista Porta in the sixteenth century; but such passages are exceedingly vague and incoherent, and leave one in doubt as to whether these writers were drawing upon their imaginations, or were darkly hinting at some form of rudimentary telescope which they did not care to more openly describe. Metallic flat mirrors were known to the Greeks 500 years before Christ, and concave and convex spherical mirrors, as well as cylindrical, were described by Seneca, living at the time of Christ; while the properties of glass and crystal lenses were more or less known to Roger Bacon, and to those other writers named above. Now, if any of these men had gone so far as to hold a concave mirror or a convex lens in front of the eye and at a distance from it less than twice the focal length of such mirror or lens, then the image of any distant objects reflected by the mirror or refracted by the lens would appear larger and nearer than to the naked eye. This constitutes the most rudimentary form of telescope, but not a self-contained telescope. There is very good ground for supposing that such rudimentary forms were known to these ancient writers, who, however, had not sufficient optical knowledge or fertility in experiment to enable them to further develop the idea. The self-contained telescope, or telescope proper, in its simplest form, must have an object-lens of a certain focal length, and an eye-lens of less focal length, mounted at opposite ends of a tube, which keeps them in alignment and at the proper distance apart.

It was such an instrument as this that Hans Lippershey, a spectacle-maker of Middelburg, in Holland, and the first discoverer of the telescope, presented to the States General on October 2, 1608, along with a petition for a patent for it. It aroused great interest, and a special committee was immediately appointed to inquire into its merits. They reported very favourably of its usefulness, and, while deliberating upon Lippershey's petition, another claimant for the invention, Jacob Andraanzoon, or Metius, on October 17 submitted another telescope to the States General, also with a petition for a patent. The result was that Lippershey failed to get his patent because the invention was fast becoming too well known, and Jacob Metius was refused the same on the ground that he had been forestalled. It was afterwards claimed for another spectacle-maker of Middelburg, Zacharias Jansen, the first inventor of the microscope, that he was the first inventor of the telescope, but this turned out afterwards to have little foundation. The news of the invention rapidly spread, and reached the ears of the famous Galileo Galilei when in Venice. He immediately set to work to think it out for himself, and succeeded very shortly after in making himself telescopes magnifying three to thirty times. The Doge and Council of Venice elected him professor of mathematics and philosophy at Padua for life at a doubled salary as a reward for his improved telescopes. Galileo immediately began those astronomical observations of the heavenly bodies which afterwards made him so famous. His scarcely veiled espousal of the newer Copernican theory of the universe, which was so clearly proved the correct one by his telescopic discoveries, involved him in that persecution at the hands of the ecclesiastical authorities which marred his later life, and has become such a well-known passage in history.

After Galileo's death, in 1642, the manufacture of telescopes was con-

aued by his pupil, Torricelli, Divini, of Rome, Campani, of Boulogne, ıd others. The principal improvement, besides the introduction of the ›sitive or convex eye-lens instead of Galileo's negative or concave eye-ns, by the great astronomer Kepler, consisted in making the object-ass of great focal length, and consequently lengthened the whole tele-ope, for the observers of that time soon found out, although they could ıly partially explain why it was so, that the longer the focal length of ı object-glass of a given size, the better its definition. Some possessing ıore than the usual knowledge of optics, such as Kepler and Christian uygens, attributed this superior excellence of long telescopes to their reater freedom from spherical aberration, in which they were afterwards roved to be right only to a very limited extent. Huygens used for most f his astronomical observations a telescope of 123 feet focal length. Vith this he made several important discoveries, chief among them eing that of the true form of Saturn's ring, an object which had sorely uzzled and exercised the curiosity and imagination of the earlier bservers. He also made telescopes of 210 feet and 280 feet focal length. .zout, a Frenchman, went so far as to make an object-glass of 200 yards ›cal length; but we are not told whether he ever managed to use it, for elestial observation with telescopes of such unmanageable lengths pre-ented many difficulties. Huygens' method was to attach his object-lass by means of a universal joint to the side or top of a pole, with a ong cord to connect it with the eye-lens, and keep it facing the latter.)thers fastened their object-glasses to the top of a tall house or church teeple; but Hevetius, an extraordinarily painstaking amateur astro-ıomer, of Dantzig, was more thoroughgoing than any of the others in ıis method of mounting his large telescopes, the longest of which was 150 feet focal length. He constructed a skeleton tube, which he hoisted ıp and swung from a tall mast. This tube was cunningly braced to-gether and kept straight by a system of struts, stays, and a complete ackle of endless ropes, like the rigging of a ship.

Altogether, the observers of the seventeenth century were characterised ›y a cheerful spirit of perseverance, would be baffled by no difficulty, and ıre deserving of all honour for the important astronomical discoveries hat they managed to make with these unsteady and unwieldy instru-ments. Such was the state of the telescope when, in 1666, the immortal Sir Isaac Newton began to bestow his attention to it. His first discovery in this direction was a very startling one to the science of that period, although familiar to almost every one nowadays. He proved that white light or sunlight, on passing through a prism or wedge of glass, is decomposed into constituent rays of different colours, which are refracted or bent aside in different degrees by the prism, the red rays being least bent or refracted, the green rays to a medium extent, and the blue and violet rays to the greatest extent. Newton at once saw the important bearing of this discovery upon the simple telescope of those days, for, since the object-lens of the telescope is of a more and more pronounced wedge shape as the edge is approached, it is clear that, if directed to a star so as to receive a beam of white light, the red rays which are part of the beam will be least refracted by the lens, while the other rays, notably the blue and violet, will be most refracted. Hence there will be, instead of one white image of the star at the focus, an infinite series of differently coloured images, the red image being furthest off the object-glass, and the blue image being nearest to it. Hence there could be no such thing as a well-defined image, and Newton proved that this defect, or chromatic aberration, as it is called, had a detrimental effect upon the definition hundreds of times greater than that due to the spherical aberration, which hitherto had alone been recognised. He also jumped too hastily to the conclusion—a very natural one to entertain—that all transparent refracting substances must, for equal degrees of deviation or bending aside of the green rays, spread out the colours to an equal extent, or, in other words, yield coloured spectra of equal length. This being the case, it would inevitably follow that no object-glass could be made to refract all the coloured rays constituting a beam of white light to one simple white focus, and therefore it was that Newton gave up the refracting telescope as incapable of improvement, and immediately turned all his attention to the reflecting telescope. This form of telescope had, as early as 1616, been proposed by Zucchi, a Jesuit, and imperfectly carried out by him. Then, in 1663, Dr. James Gregory, of Aberdeen, proposed that form of reflector which bears his name, but could not get it executed. But Newton, who combined inventive genius with manual dexterity, succeeded in 1668, in making the first reflecting telescope of good quality, and of the construction now known as the Newtonian, but of very small size. In 1671 he made a better one, which was examined by the King and several prominent Fellows of the Royal Society, who expressed themselves astonished at its performance, and forthwith had Newton elected a Fellow of the Royal Society. After Newton's death, no progress was made with the reflecting telescope until 1722, when John Hadley, inventor of the sextant, began to successfully make them of a considerable size. Bradley and the famous James Short, of Edinburgh, were the principal and most renowned makers of reflecting telescopes during the eighteenth century up to the time of the illustrious Sir William Herschel. The reflecting telescope, on the other hand, remained in the same primitive state up to the year 1758, when the epoch-making discovery of John Dollond broke through the spell which the great authority of Newton had cast over all investigations in prismatic optics. He had promulgated the doctrine that colour dispersion must for all substances bear the same ratio to deviation, and it had occurred to no one to question the dictum of so great a mind.

The Swedish philosopher, Klenginsteirna, repeated some of Newton's experiments with prisms of water and glass, and found the results very different to what Newton had described; and shortly after John Dollond carried out the same experiments, and, realising the great practical importance of the subject, pursued it further, inasmuch as he investigated the behaviour of prisms made not only of different liquids, but of different sorts of glass, and found, much to his surprise and delight, that a prism of flint glass, arranged to refract or turn aside the green ray through the same angle a prism of crown glass, nevertheless gave a spectrum fully half as long again as the spectrum yielded by the crown-glass prism. The corollary from this, which he also proved by further experiment, was that a crown-glass prism refracting the green ray through an angle of 30° and a flint-glass prism refracting the green ray through an angle of 20° would yield spectra of equal lengths, so that, if the two prisms were united so as to refract in opposite directions, then there would be a balance of refraction equal to 10° left over on the side of the crown-glass prism, while the emergent beam would be colourless, since the spectra or colour dispersions were not only opposite, but equal. Here was a grand discovery, which Dollond speedily availed himself of. He made a crown-glass convex lens of power 3, and combined it with a flint-glass concave lens of power 2, and thus obtained a compound lens of power 1, which gave an image at its focus practically free from those colour aberrations which marred the simple refracting telescopes of the seventeenth and early eighteenth centuries. Dollond was awarded the Copley gold medal of the Royal Society for his great discovery, and also elected a Fellow of that body; but he died very shortly after, leaving his son to carry on the manufacture of the new achromatic telescopes, which, even in small sizes, far surpassed in excellence of definition the prodigiously long simple telescope of the previous era.

But there was one very serious obstacle which prevented the carrying out of achromatic object-glasses of any size greater than about 5 in. aperture, and that was the impossibility of obtaining large enough slabs of homogeneous flint glass; it was always marred by internal inequalities of composition, showing as waves and striæ, &c., which rendered it useless for lenses. This was the difficulty to be overcome before any further progress could be made in the achromatic reflecting telescope, and the French Academy of Sciences, the London Royal Society, and the Board of Longitude offered handsome rewards to any one who would invent a really reliable process of making pure and homogeneous flint glass. Simple as it may seem to the uninitiated, yet this glass more or less baffled all the manufacturers, in spite of the stimulation offered, except one man, Mons. Guinand, a poor cabinet-maker and watch-case maker, born in 1744, at Neuchâtel. This man early developed an intense interest in whatever related to the telescope, and, after Dollond's discovery became known, attempted to make achromatic telescopes for himself, but speedily realised the vexatious difficulty of obtaining good flint glass; so he set to work to experiment in glass-making for himself, and, after many years of herculean efforts, heart-breaking failures, and pecuniary losses, which would have broken the spirit of any ordinary man, he at last succeeded in reducing flint-glass making to a fairly certain process, and was generally able to obtain at least half of his meltings homogeneous and pure enough to furnish discs of flint glass up to 12 in. diameter and more. Thus, through the almost incredible labours of this too-little-known man of unconquerable perseverance, the optician's art was enabled to progress.

The lecturer showed lantern slides of some of the more epoch-making telescopes, many portraits of the most eminent of the men who laboured to perfect the telescope, and a few diagrams and drawings of celestial objects as sketched by the observers of the seventeenth century.

A CHANGING STEREOSCOPE.

Mr. W. A. Fried has patented a photograph changing stereoscope, constructed after the manner of American stereoscopes, in which the inconvenience of insertion of fresh pictures is entirely obviated, and new scenes are brought continually before the eye of the spectator, which may be effected in alternative desired sequence from left to right or right to left and at any speed.

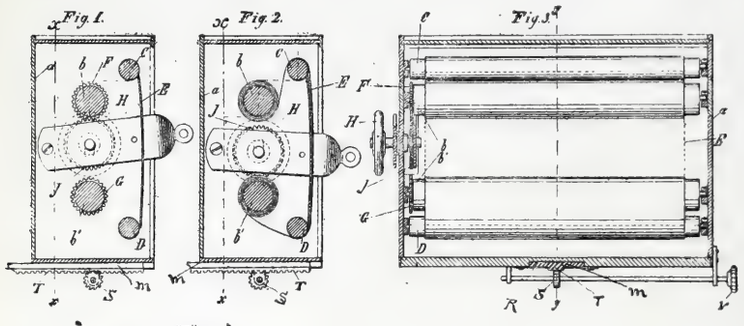
Fig 1 is a sectional view on the line, $y\,y$, of fig. 3 with the strip of pictures omitted.

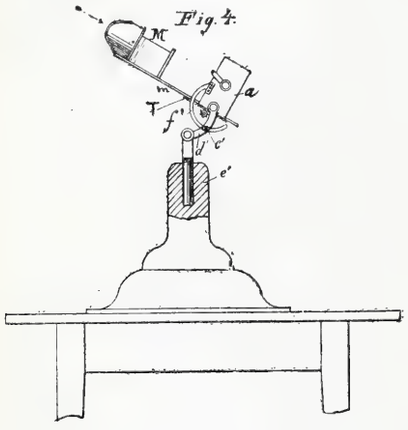
Fig. 2 is the same view with the strip of pictures fed over rollers.

Fig. 3 is a longitudinal section on the line x—x of figs. 1 and 2.

This invention consists essentially of a rectangular metal box, *a*, within which is fitted a winding-off or stock roller, b^1, and a winding-on roller, *b*, for photographic pictures, which are either on ordinary photographic paper, strengthened by linen, or copied direct on celluloid or film. The strip is led at the open front side of the box over two guiding rollers, C and D, and for flattening the picture, over a protecting shield, E, inserted at the back. The rotation of the "winding on or off" rollers, $b\,b^1$, is effected by change gear, F, G, driven alternately from a hand wheel, H, with a cogwheel, J, arranged on the inside of the box to gear alternatively into F or G. According to the position of the cog-

wheel, J, the latter may be made to engage either with the winding-off roller, b^1, or with the winding-on roller, b, and the direction of movement of the passing pictures may be thus reversed. The eyepiece, M, of the stereoscope is fixed to a bar, m, sliding in a recess, R, in the bottom of the box, a, and it is operated for adjustment of the eyepiece by a rack, T, under said bar, m, by a pinion, S, worked by a hand wheel, V.





In order to avoid the removal of the stereoscope from the eyes to change the picture, it may be mounted on the head of a suitable heavy stand, e^1, so as to revolve thereon, and, in order to fix it in a desired angular position, a segmental piece, f^1, may be provided on the box, a (fig. 4), which can be fixed to the arm, d^1, of the head of the stand by means of a clamp screw.

The claims are:—

1. An arrangement in so-called American stereoscopes, consisting of a box, with windable web stereoscopic pictures, and direct front illumination of the picture, the stereoscope being adjustable by combination with a stand.

2. In the arrangement claimed in Claim 1, a device for changing the direction of movement of the "winding-off" and "winding-on rollers," consisting of cogwheels on said rollers alternatively gearing with a central hand-driven cogwheel on pivoted frame.

3. In the arrangement claimed in Claim 1, a rack on the bar of the eyepiece, and a pinion with hand wheel on the box or case, for the purpose of adjusting the distance of the stereoscope pictures to the eyesight of the spectator.

EXHIBITION OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The Eighth Annual Exhibition of this prosperous Society was opened on Saturday last, the 6th inst., by Mr. T. Sebastian Davis, F.C.S., F.R.P.S., and will remain open until the 13th inst.

The Exhibition is being held at the Public Baths, Church-street, Camberwell, S.E., and the Society is fortunate in being able to secure so suitable a place for the purpose. Some idea of the accommodation may be formed from the fact that very nearly 500 frames are hung, spaced out, and then only the sides of the hall are used.

Every one knows that the South London Society is famous for the architectural photographs produced by its members, and the present Exhibition is in no way behind its predecessors as regards work of this kind, either in quantity or quality. Every class in which an architectural photograph is possible bears testimony to the predilection of the members, and from the walls of the Exhibition a very fair idea may be gained of the exteriors and interiors of most of our cathedrals, at any rate of those within 150 miles of London.

The Judges who acted were Messrs. A. Mackie, F.R.P.S., and J. A. Sinclair, F.R.P.S. Silver and bronze medals were placed at their disposal at discretion. In the members' classes, Class A (Portraiture and Figure Studies), a bronze medal was given to E. Matthews for a graceful head printed on Argura paper entitled *Meditation*, and a second bronze medal to W. Howell for a *genre* picture, *The Old Folks at Home*. As a class, it could not be said that it was a strong one. Class B (architecture) is, of course, a strong one. The silver medal was awarded to A. Fellows for *The Nave, Ely Cathedral*, a well-chosen view, excellent in technique, both in the negative and the print, which is in sepia platinum. A bronze medal was given to H. Goodwin for *North Choir Aisle, Ely Cathedral*, which except that is a little woolly in texture, is an admirable piece of work. The Hon. Secretary of the Society, C. H. Oakden, also receives a bronze medal for *In the Morning Chapel, Salisbury Cathedral*, a meritorious picture, though not so interesting a subject as some he has exhibited. In Class C, (Landscape and Seascape above half-plate) a silver medal falls to G. J. T. Walford's *Winter's Dual Robe, Snow and Mist*, a charming effect of the sun just breaking through the mist. The tone of the picture strikes us as being true, the snow not being dirty-looking, as it is frequently rendered, and the tree stems being grey, as they would appear through the mist. Class D (Landscape and Seascape, half-plate and under), is not a good class. *The Mill Stream*, by Dr. J. L. Pochin, shows some appreciation of what is required in a picture, but it can hardly be considered quite a success. It has a weak foreground where force was wanted. It receives a bronze medal. Class E (Enlargements). In this direction evidently the Society does not shine. *A Portrait of a Child*, by Albert Flint, to which a bronze medal is awarded, is certainly the only exhibit that shows any amount of technical skill. In Class F (Lantern Slides), bronze medals are given to Messrs. Edgar R. Bull and C. H. Oakden, in each case for architectural subjects. In Class G (Pictures taken on the Society's Excursions), W. D. Welford takes a silver medal for *Amidst the Flowers at Play*, and C. H. Oakden a bronze medal for *Doorway of Chapter House, Salisbury*. In Class H (Hand-camera Work), W. D. Welford is again successful, a bronze medal being awarded to *She Wandered by the Stream*.

In the open classes, Class J (Pictures which have previously received an award) is, as is so frequently the case in Champion classes, on the whole, a poor class; but still it is a feather in the cap of the Society that the only medal—a bronze one—is awarded to one of the members, W. Howell, for *The Choir, Salisbury Cathedral*, certainly a very fine specimen of interior work. Among the other exhibits are well-known works by S. N. Bhedwar, G. Lafayette, H. Esler, J. Gunston, J. Bulbeck, C. E. Fairman, J. E. Dumont, C. F. Inston, and C. H. Oakden. Class K (Pictures not formerly medalled) is a very large class, containing no less than 140 frames, by nearly sixty exhibitors. A silver medal is awarded to Fred Coop for *Above the Valley Mists*, a picture which will have many admirers, although the title does not appear to fit it entirely, for one of its charms is in its misty distance. It is framed, too, in a manner which will not command universal admiration. A silver medal is also awarded to J. Bulbeck for *Winchester—South Processional Aisle*, one of a series of architectural photographs, all of which are of almost equal merit. F. A. Bolton receives a bronze medal for *The Close of a Winter's Day*, a picture that Mr. Bolton has not made the best of in his method of mounting and framing it. Harry Dowden, who also receives a bronze medal for *A Study of a Head*, seriously jeopardised his chance by the printing process and frame he chose for his picture; it is a glazed gelatino-bromide print, toned to a bright purple, in a frame with gilt scroll work, which attracts the eye in a most disagreeable manner. Class L (Lantern Slides which have previously received an award). This, unlike the Champion Class in prints, is an exceedingly good class. A silver medal was awarded to H. Esler, and bronze medals to E. R. Bull and Paul Martin. In Class M (Lantern Slides not previously medalled), a bronze medal was given to Rev. E. Rainbow, M.A. In Class N (Photo-micrographs and other Scientific Subjects), the Judges declined to make an award, but recommended that the exhibits should be submitted to an expert in the subject. In Class O (Stereoscopic Slides), C. H. Oakden was again successful, and obtained a bronze medal.

The trade exhibits form an interesting feature of the show, and among the stall-holders were Messrs. The Prosser-Roberts Company, A. and J. Smith, of Aberdeen, William Tylar, the Infallible Exposure Meter Company, R. and J. Beck, Limited, the Cresco-fylma Company, Holmes Brothers, A. Salmon, Noakes & Norman, Edwards & Handcock, Thorn & Hoddle, and T. J. Borland. The Judges awarded a silver medal to the Cresco-fylma Company for the most interesting stall, and, in the competition for the most useful novelty exhibited, the Infallible Exposure Meter Company received a silver medal for Wynne's Print Meter.

Other attractions of the Exhibition are X-ray demonstrations, the cinematograph, and lantern shows each evening.

The catalogue was well compiled, and was extended, by advertisements of photographic dealers, and others, to a volume of ninety-six pages.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

PURIFYING FRENCH CHALK.—S. S. C. says: "In an article on clean glass in your last issue Mr. W. B. Bolton gives a method

of purifying French chalk for polishing purposes. I have tried it, and got perhaps a polishing *solution*. Boiling with soda made a very slimy mess, so I decided to go "one further," and try the additional treatment with nitric acid mentioned. The result was a most awful "fizz," ending in a clear solution and the exhaustion of my stock of nitric acid. Perhaps Mr. Bolton will give us further particulars. I got my French chalk at the chemist's; it was labelled "Glove Powder," which he said was the same thing. I may also add that I have given up using a substratum, because I get such stained plates with it, but I notice that the same article speaks of the substratum as a safeguard against dirty glass."

Bisulphite of Soda.—Young Amateur writes: "I tried to get some sulphite of soda at a local chemist's shop, and when I got it home I found it was labelled "Bisulphite of Soda." I took it back, and was told that it was practically the same thing; at any rate he had not the sulphite, so I kept it; but I found, on using it in the same way as sulphite, that the solution has no action at all unless I use a tremendous lot of soda solution. Is this right?"—It is as might be expected. The bisulphite contains a far larger quantity of sulphurous acid than the neutral sulphite, and consequently neutralises a good deal of the alkali. Otherwise it is "practically the same."

Albumen Paper.—John P. asks: "Can you tell me of any way by which I can avoid making a large quantity of silver bath, as I want to try albumen paper, but very possibly not take to it finally, so do not want to waste silver needlessly?"—You can apply the silver with a brush, when a small quantity of solution will suffice. Why not get ready-sensitised paper?

Our Editorial Table.

The Westminster Enlarging Paper.

Otto Scholzig, 31, Binfield-road, Clapham, S.W.

This is a developing paper, recommended for enlargements, which is claimed to give the same rich tones with transparent shadows as albumen or gelatino-chloride prints, instead of the dull, heavy blacks of bromide papers. A specimen enlargement submitted to us is of admirable quality, being soft and harmonious and of great transparency in the shadows; it bears indeed a striking likeness to a well-executed enlargement on printing-out paper. It is claimed that the Westminster paper obviates the necessity of retouching, and that the negative produces as fine a direct enlargement, and of the same tone as the contact print taken from it. The results are undoubtedly very pleasing. For enlarging, the correct exposures for warm tones, such as those on albumen or emulsion paper contact prints are as follows:—

Enlarging negative of average density 2½ diameters with *f*-8 lens.

Direct exposure to good clear north sky ..		30 to 35 minutes
With condenser	Incandescent gas burner (55 candles)	1½ to 2 hours.
	Acetylene lantern burner (160 candles)	30 minutes.

Shorter exposures give colder tones and harder contrasts. The best result is obtained by enlarging with direct or reflected sky. An eikonogen developer is recommended, a gold toning bath being used after fixation.

The "Novitas" Stripping Film P. O. P.

Otto Scholzig, 31, Binfield-road, Clapham, S.W.

The Novitas printing-out paper admits of the image being stripped and transferred to either a transparent or an opaque support, so that lantern slides, transparencies, or photographs on porcelain, opal, ivory, or other substances, may readily be obtained in this manner. The results yielded are beautiful in the extreme, the richness of tone and delicacy of gradation imparting very great charm of effect to these transferred images. Printing, washing, toning, and fixing do not vary much from the usual procedure. The following are the instructions for the transfer of the picture: When fixed, wash for fifteen to twenty minutes in many changes of clean water, and place the print face down on to a piece of transfer paper of same size, supplied with the paper, and place them together in a dish containing hot water of about 120°, which will dissolve the substratum of the film. Whilst this is softening in the warm water, place the object upon which the print is to go into position, and paint it with a gum arabic solution (1 drachm to 1½ ozs. water.) Now carefully detach the paper support from the film, remove all particles of softened gelatine that may adhere to the film, and place the latter with its support of transfer paper face down on to the plate or object prepared to receive it. Rub down, remove the excess of gum, pull off the transfer paper, and allow to dry.

Wray's Cinematograph Lenses.

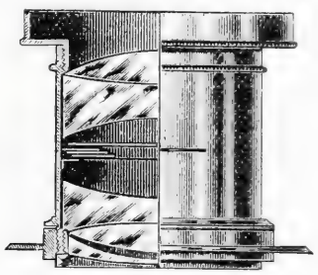
W. Wray, North-hill, Highgate, N.

The extent to which the projection of animated photographs has grown in popular favour has induced Mr. Wray to provide a lens specially made for use with the kinetoscopic lantern. The lens is made in two series—No. 1 is of two inches' focus and works with an aperture of *f*-2; No. 2 is of three inches' focus, working at *f*-3. Besides well covering the standard size of films, the lenses can be used for ordinary photographic purposes, for which stops are provided; otherwise, they are mounted with either a spiral-slot focussing adjustment, or in a separate jacket having a cam arrangement. The three-inch focus lens has a clear aperture of an inch, and is mounted in a tube two inches long, so that in size and appearance it resembles a small doublet lens. The cinematograph lens has been found well adapted for its special purpose of projecting cinematographic positives.

The *F*-6 Stigmatic Lens.

J. H. Dallmeyer, Limited, 25, Newman-street, W.

The Series II. stigmatic lens, *f*-6, is a universal lens, and differs somewhat in construction from the series, *f*-4·5. It consists of five lenses, as shown in the illustration, and is intended for every class of photography from portraiture to wide-angle work. It is claimed to be perfectly free from spherical aberration, and the full aperture



of the lens may be used in focussing, there being no fear of any alteration taking place in the focal length of the lens when changing the size of the stop. At full aperture the lens covers slightly larger plates than those for which it is made, and it includes an angle along the diagonal of the plate of about 85°.

News and Notes.

The slides used by Dr. Nansen at his lectures were made by Messrs. Newton & Co., 3, Fleet-street, who are now placing them on the market.

The Albion Albumenising Company, of Glasgow, have opened a London agency at 22, Cecil-court, Charing Cross-road, W.C., which will be in charge of Mr. C. M. Hepworth.

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, March 16, at eight p.m., at 12, Hanover-square. Novelties of interest to photo-mechanical workers will be shown.

Photographic Club.—Wednesday evening, March 17, at eight o'clock. Mr. Emil Kehle, of Newark, New Jersey, will give a demonstration of his new self-toning paper, in which the printing and toning are accomplished simultaneously. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

Th. Guillox (*Medical Week*, June 5, 1896) says that he first successfully employed photography of the retina for clinical purposes in the year 1893. His procedure is based on the following principle: "When the pupil is dilated the fundus of the eye may be illuminated, so as to permit of examination of the retina with a lens, without the necessity of any ophthalmoscopic mirror. The observation is thus made on the reversed image, and it is this image which is fixed by means of a photographic objective. Moreover, as the time of exposure, however short, is an inconvenience, he has constructed a special apparatus for instantaneous photography of the retina. The photographs obtained in this manner show the ophthalmological image reversed, as it appears on examination, with the reflection from the optic disk and cornea; but since then the author, by a new method of illumination has succeeded in getting rid of this reflection."

We are informed that the Photographic and Process Section of the forthcoming Paper and Kindred Trades Exhibition, to be held at the Royal Agricultural Hall, London, from June 23 to 30 next, has been taken in hand by a small advisory Committee of three Fellows of the Royal Photographic Society. Prospectuses of this special section will be issued very shortly, and will offer a very liberal series of prizes, some of which are intended specially for the professional photographer. In fact, the professional side will be much more prominently catered for at this time than at most other photographic exhibitions, and as there has been considerable outcry for more encouragement for professional work, it will be interesting to note whether the profession will take advantage of this offer. The classes will include a champion class, a beginners' class, and a class for lantern slides, while prizes will also be offered for plain enlargements, for working up in black and white, and for working up in colour.

The explosibility of acetylene in combination with various metals has been the subject of a number of experiments by Herr Julius Pintsch, of Fürstenwalde, at his works. Five steel cylinders were filled with pure acetylene, or mixtures of 80 per cent. of acetylene and 20 of coal gas. Water was then poured into the cylinders and various metals and alloys inserted, the cylinders being exposed for nearly a year in an open shed to heat and frost. Most metals proved unattacked; lead, zinc, and particularly copper and its alloys, were attacked; but no explosive compounds had formed, and from these and other experiments with dry gases the conclusion is drawn that the explosive copper compound will not form unless there is ammonia present. The most unpleasant feature is that acetylene decomposes under explosion in the absence of oxygen, at a heat which may be produced by local action of small quantities of water on the carbide, as was first pointed out by Pictet. Herr Pintsch is reported to have exploded many cylinders, sixty explosion tests being made. Mixtures with gases will also explode on heating, but the explosion takes place at considerably higher temperature, and mixtures with less than seventy per cent. of acetylene are as safe as ordinary gas.

The Annual Exhibition of the Gospel Oak Photographic Society was held on Monday, March 1, in the Lecture Hall of the Gospel Oak Congregational Church, and was extremely successful. The Judges, Messrs. Debenham and Croal, awarded four medals, one to Miss Pridham in the Portraiture Class, and three to Mr. T. Adams in the Landscape, Lantern Slide, and various classes. Mr. Adams was, however, debarred by the rules of the competition from taking more than one medal. There was also a very fine display of members' work on view, also framed productions by the Heliochrome Company, Messrs. Edwards & Co., Messrs. Lumière's, and the Sandell Works Co. The manufacturers were represented by the Eastman Photographic Materials Company, the European Blair Camera Company, Messrs. Beck & Son, Messrs. Thornton & Pickard, Fuerst Brothers, Messrs. Salmons, Messrs. Carters, Newman & Guardia, Horne's, Schölzig, Willway (Bristol), and others. During the evening demonstrations were given of flashlight photography, platinotype, and enlarging, and were very much appreciated. The Exhibition, which, considering the state of the weather, was well attended, was brought to a close by an exhibition of members' lantern slides, the Secretary presiding at the lantern.

Defective Patent Laws.—Mr. Gustav Kusterman, of Green Bay, Wisconsin, has written and published a criticism on the defects in the patent laws of the United States, in which he calls attention to the fact that the patent laws of that country allow an inventor to first secure a caveat, which may be extended for an indefinite period by paying the sum of ten dollars a year. The protection thus granted an inventor continues until some other patent is entered which, according to the views of the Patent Commissioner, conflicts with the invention on which a caveat is secured. The holder of the caveat is then given three months' time in which to apply for a regular patent. As shown by a report of the Commissioner of Patents, there are now more than 1600 caveats running from five to fifteen years, which have the effect of extending the life of patents just those number of years. For instance, if a caveat is permitted to run fifteen years, and a regular patent is then granted for seventeen years, the inventor is protected for a period of thirty-two years. In no other country is such liberality of protection extended to a patentee. On the contrary, in some countries the right is reserved for the revocation of a patent if the patentee charges an unreasonable price for the patented article, or refuses to others the right to use or manufacture it for a reasonable remuneration. In Russia no patent is granted for a longer period than ten years, and it cannot at the expiration of that time be renewed under any circumstances. In the United States a sewing-machine patent was twice extended by Act of Congress. The trust which bought it collected 4,000,000 dollars from royalties from outside licensed companies, whilst the inventor only received 4000 dollars for his labour and inventive skill. Under United States patent laws, an inventor without capital is virtually at the mercy of infringers, however meritorious his patent may be. He is therefore generally driven to the alternative of losing the results of his labour and genius, or accepting such offers of compensation as capitalists or trusts may propose to him. In Norway and Great Britain questions of alleged infringement must be settled before a patent is issued, and the patentee may then reap the full benefit of his invention without fear of interference. In the United States the entire cost of a patent for seventeen years is paid at the time it is granted. In France, Germany, Austria, and in other European countries only a small payment for a patent is required the first year, and a proportionate amount to be paid annually while the patent is in force. Under this system poor inventors are less at the mercy of money-lenders than under the system in the United States. In Germany the Commissioner of Patents is authorised to release parties from paying the first three instalments if poverty is proven. Sweden, Switzerland, Germany, Brazil, Mexico, and other countries reserve the right to annul a patent if, after two or three years, the patentee has failed to place his invention on the market or refuses the use of the article or idea to others, though offered a remuneration thought to be reasonable by the Patent Commissioner.

Patent News.

The following applications for Patents were made between February 24 and March 3, 1897 :—

Röntgen Rays Photography.—No. 4753. "An Improved Portable Camera for 'Röntgen Rays' Photography." G. Seguy.

Electro-photographic Apparatus.—No. 4981. "Automatic Electro-photographic Apparatus for the Prevention of Burglars." Complete specification. C. Parodi.

Screen Kinetoscopy.—No. 4906. Improved Mode of and Apparatus for taking Serial Photographs and projecting such Photographs." Sir H. Grubb.

Chrono-photographic Apparatus.—No. 5026. "Improvements in Chrono-photographic Apparatus. Complete specification. A. Rateau.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
15	Camera Club	Illustrated Counties: 1. Rural Middlesex.
15	North Middlesex	*Various Printing Processes.* E. R. Mattocks.
15	Richmond	*Platinotype.* J. H. Williams.
15	Southland	Architecture.
15	South London	Demonstration of the Use of Multiple-coated and Thickly coated Plates. J. T. Sandell.
15	Stafford Y.M.C.A.	Demonstration in Lantern-slide Making. Mr. Rostance.
15	Stockport	Prize Slides.
16	Birmingham Photo. Society	Demonstration on the Production of Lantern Slides. James Shaw.
16	Brixton and Clapham	Lantern Evening: Slides by J. Gunston.
16	Gospel Oak	General Meeting.
16	Hackney	*Lantern-slide Making by Reduction.* Dr. Roland Smith.
16	Leeds Photo. Society	*Brittany.* W. J. Warren.
16	Lewisham	*Intensification and Reduction of Negatives.* Thomas Bolas, F.C.S., F.I.C.
16	Royal Photographic Society	Photo-mechanical Meeting.
17	Borough Polytechnic	*Stereoscopic Photography.* J. D. Evans.
17	Croydon Camera Club	Seventh Annual Dinner.
17	Leeds Camera Club	Prize Slides.
17	Leigh	Members' Lantern Evening.
17	Leytonstone	*Trick Photography.* A. Hands
17	Photographic Club	Demonstration of New Self-toning Paper. Emil Kehle.
17	Southport	Prize Slides.
18	Ashton-under-Lyne	Annual Meeting.
18	Aston	*The Trees of Commerce: the Growth, Structure, and Chief Characteristics and Commercial Values of Forest Trees* Mr. Harper.
18	Camera Club	*Geographical Pictures, with Hints to Amateurs.* Dr. H. R. Mill.
18	Goldsmiths' Institute	*Chemistry of Intensification.* A. G. Bloxam, F.I.C.
18	London and Provincial	Lantern Night.
18	Oldham	*Swiss Saunterings.* T. Widdop
18	Putney	*Making Enlarged Negatives.* Francis T. Beeson.
18	West Surrey	*Retouching.* Mr. Dorrett.
18	Woodford	*Notes on Art.* J. P. W. Goodwin.
19	Bournemouth	*Across the Polar Regions.* Dr. Fridtjof Nansen.
19	Croydon Microscopical	Lantern Evening: Members' Slides.
19	West London	Members' Lantern Evening.
19	Wolverhampton	Members' Lantern Evening and Annual Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

March 9, Ordinary Meeting, Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

New Members, &c.

Five new members were elected, and it was announced that Major Lysaght, being unable to accept office as a member of the Council, Mr. J. C. S. Mummery had been elected to serve on that body.

Affiliation.

The Hon. Secretary announced that the Council had admitted the following Societies to affiliation: Monklands Photographic Society, Croydon Microscopical and Natural History Club (Photographic Section), Borough Polytechnic, Batley and District Photographic Society, Scarborough and District Photographic Society, and Durham City Camera Club.

The Making of Pictures.

Mr. W. L. Wyllie, A.R.A., gave demonstrations on the making of pictures, which he introduced by saying that, when he was asked by the Hon. Secretary to read a paper upon an artistic subject, he thought that would be a terrible thing to do, as he might talk for weeks without making any one much the wiser, and he therefore decided to make a few pictures before the Society, and to invite questions upon points suggested by them. Proceeding with his demonstration, Mr. Wyllie exhibited what were apparently two paintings representing sailing vessels in such a manner as to illustrate the different character

the images given by wide and narrow-angle lenses respectively, but, when he d made a few observations with regard to these pictures, he removed them m the canvas frame by simply taking them off, for the ships and other jects had previously been painted upon brown paper, cut out scrap fashion, ked in water, and placed upon the canvas while wet. The effect of this built-up" painting was most excellent, and a round of applause evidenced e surprise of the audience when its nature was disclosed by the bodily moval of its components. Several pictures were constructed in a similar y. The effect of placing the camera at different heights was shown by ering the positions of the men and the spectators in a cricket field, and the ws of perspective were illustrated by several seashore views. Every rrectly drawn picture, he said, had a certain point at which it would look ght; for instance, if a photograph taken with a lens of eight-inch focus were ewed at a distance of eight inches from the observer's eye, the objects repre- nted would appear the same size as if seen in nature at the distance from which ey were photographed. When composing a picture, it was necessary to con- ler the circumstances under which the result would be seen; artists frequently umbled about the hanging at the Royal Academy, because a picture which had rhaps been painted in a small room, was hung in such a position that a ar view could not be obtained, and the effect consequently appeared hope- ssly wrong. A great many people thought photographs grotesque and im- ssible, but this was simply because they had never taken the trouble to look a photograph at the correct distance. In making a picture, a certain nount of pleasure was given to the eye by a suggestion of distance, which uld be given by means of lines, such as cart tracks, vanishing into the sub- ct. The use of vanishing lines was also an advantage in relieving what ould otherwise be a flat surface.

Mr. Wyllie's demonstration was a demonstration in the strictest sense of the rm, for he did not read a paper or deliver a lecture, but brought out all his ints by the manipulation of his painted and cut-out figures, with only an casional interjected remark of a controversial nature. His novel methods ere watched with very considerable interest, and the proceedings closed with hearty expression of thanks to him, no discussion taking place.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ARCH 4,—Mr. A. E. Smith in the chair.

Mr. J. E. HODD described a new cyclists' hand camera, with a magazine r twelve plates, focussing scale, time and instantaneous shutter, rectilinear ns of five and a half inches focal length, and the usual accessories.

CARBON PRINTING.

Mr. G. H. JAMES gave a demonstration of that branch of carbon printing nown as the single transfer process. Having pointed out the nature of the mposition with which the paper is coated, and the fact that it was com- ercially obtainable in either a sensitive or unsensitive state, Mr. James re- arked that he did not recommend one to make his own carbon tissue, but to ake use of the commercial article. Having obtained the tissue, it is first ecessary to sensitise it, and this is done by immersion in a solution of bichro- ate of potash. The operation is simple, and the many conveniences it gives ver the use of ready-sensitised tissue will repay the extra trouble. The rength of the bath for a new worker should be two and a half per cent., ielding a fairly rapid tissue, and one that is suited to all ordinary negatives. he dish, which should be of porcelain, is preferably a very deep one, allow- g of a thorough immersion of the tissue, which should be done by bending ack the ends and bringing the middle into contact with the bath, when the nds are then lowered. It is best to lightly brush over the surface of the tissue the bichromate. The average time for soaking would be about three inutes, after which the tissue has to be dried. There are two principal ays of doing this. One is to simply hang it up and allow it to dry in hat way, and another is to dry on talced glass or a ferrotype plate. he superfluous solution should be squeegeed out. He thought the better ay was to use the ferrotype plate, leaving the tissue until it was eady to strip off. This method gives a nice flat piece of tissue to work ith, instead of being cockled and uneven, as when dried by itself. It s absolutely necessary to protect the edges of the tissue, in printing from he negative, from exposure, and this is done by means of what is very roperly called a "safe edge." Lantern-slide binding strips may be used, r a cut-out mask, for this purpose. During the exposure of the tissue o visible change takes place in it, the colour remaining the same, so that it ecomes necessary to have some means of timing the exposure. An instru- nent known as an actinometer (of which there are several forms), consisting f a series of densities, is used for this purpose. Mr. James had not much raise for the commercial forms obtainable, preferring to use one of his own ake, composed of a series of paper strips, one over the other, numbered ccording to density. Having experimentally ascertained the printing speed f the negative and the equivalent actinometer density, one is able to accu- ately determine the exposure of the carbon tissue. After printing comes he development of the tissue, and Mr. James expressed his satisfaction that, fter the sensitising, no chemicals were concerned in the finishing of the rint. By the action of light, the bichromated pigmented gelatine has been endered insoluble to a greater or smaller degree, according to the quantity f the light transmitted by the negative. Development consists in washing way the still soluble mixture, leaving a positive image in insoluble gelatine. t is necessary to develop the print on a separate piece of paper to that on which the pigment was coated and exposed, and it has therefore to be trans- erred to prepared single-transfer paper. This must first be soaked in cold vater until limp, when the exposed tissue is likewise immersed in cold water. n three or four minutes it will begin to curl outwards, and as soon as this ccurs the two prepared surfaces are brought into contact under the water, and he two lifted out and squeegeed together. It should then be left under light pressure for five to ten minutes. With smooth papers, a convenient ime is five minutes, but, with rough papers, it is often necessary to leave hem for even forty minutes, under very great pressure. Development is ffected with hot water, the normal temperature being 105°, though it may ary from 95° to 130°. The gelatine shortly begins to melt away from the edges of the tissue, when the papers can be carefully separated. The print is now shaken in the hot water, causing the soluble mixture to wash out, and leaving an image formed of the insoluble remainder. It is then placed in cold water for a short time, and hung up to dry. Some people soaked it in alum, but it is not really necessary, except when the paper is stained with bichromate. Mr. James then went more minutely into the several details of the process, discussing the use of the "safe edge," and showing the effect of its non-use. As regards the bichromate, there were at least three samples sold by ordinary chemists, but the best for the purpose was the recrystallised. The ordinary kind could be used, but would have to be neutralised. The time of soaking the tissue had a certain amount of effect on the speed, as shown by a diagram he passed round. Mr. James found that, though the sensitiveness of the tissue could be considerably varied by different percentages of bichromate, this power ceased when the strength reached six per cent., there being practically no difference in the results between that and a saturated solution. The continuing action of light he had not taken much into account, but he showed its effect. Specimens were passed round to show what could be done by altering the heat of the developing water, over-exposure requiring greater heat than under-exposure. It was perhaps as well to commence with coldish water, increasing the temperature according to the appearance of the image. The carbon process had the advantage that, whereas most of the other printing methods required that the negative should be suited to the printing process, with the former it was possible to suit the process to the negative. Mr. James concluded with a catalogue of the failures to be met with, due either to finger marks, local fog from one cause and another, uneven development, uneven sensitising, sparkling tendency due to small air bells, and insoluble spots. The transfer paper is easily prepared as follows: Make up a five per cent. solution of gelatine, and dissolve twenty grains of chrome alum in two ounces of water. The chrome alum is added to five ounces of the gelatine solution. Some of this is poured on the paper and spread over thoroughly by the hand or squeegee.

A discussion ensued, in which the Chairman, Mr. Beckett, Mr. Everitt, and Mr. Martin joined. Mr. James having replied, a cordial vote of thanks was accorded him for his demonstration.

Borough Polytechnic Photographic Society.—March 3, Mr. Bedding in the chair.—At the conclusion of the ordinary business on March 3 the subject of the forthcoming summer excursions came up for discussion, and it was decided to hold the outings every other Saturday afternoon throughout the season. Amongst other places, it was decided to visit the following: Leatherhead, Kew, Chingford, Purley, Well Hall, Chislehurst, Hayes, Crohamhurst, Rye House, Wanstead Park, Barnes, and St. Paul's Cray. Leaders were appointed for each place.

Brixton and Clapham Camera Club.—March 2, Mr. J. W. Coade presiding.—The affiliation lecture on

INTENSIFICATION AND REDUCTION

by Mr. T. Bolas, F.C.S., F.I.C., was read by the Secretary. An advantage of the lecture is the fact that it does not consist of a tedious record of laboratory experiment, but confines itself to a few well-tried formulæ, sufficient for all practical requirements—and explains the method of working with them. Through the courtesy of Mr. H. Snowden Ward, some slides by Drs. Miethe and Kaempfer were shown. They were of ordinary French size, 4×3¼, and a fault of all was their want of suitable masks and their cloudless skies. Dr. Miethe's series were taken with a hand camera fitted with a collinear lens. Many of them were of fair quality, but others made one wonder, like the Gay Tom-tit in the "Artist's Model when—

> "He said, 'Oh, my,' and he said, 'Oh, lor,'
> And, he said, 'What on earth has he done that for?'"

As regards Dr. Kaempfer's, little can be said, as they were apparently all copies of prints, and some were poor even at that. Certainly many of the slides—particularly those of Moorish architecture—were interesting on account of the subjects they represented, and made one envy those who have opportunity for such splendid work with the camera. On the whole, however, if the slides by these two gentlemen are fairly representative of German work, it is evident we are far ahead of that country in lantern-slide making.

Croydon Camera Club.—An introduction to photo-pigment printing formed the staple of the meeting on the 3rd inst. The subject was opened with a short address by Mr. JAMES PACKHAM, F.R.P.S., who traced the gradual perfection of the knowledge and application of the bichromate of potash to alter under the action of light from a period dating back a full hundred years, although it was not until 1832 that the germ of the process under consideration was discovered, when Dr. Suckow announced the advantage which followed organic matter (gelatine) being intimately associated with the above salt. The more immediate perfectors of the method, as we now know it, were also given due credit. Mr. Packham proceeded to give a series of elementary hints, and also advice about the materials and apparatus used and respecting their manipulations. He also, during the evening, from time to time supplemented the demonstrations which followed by explanatory remarks. At the close of the address, Mr. LIONEL G. KOUGH gave a successful demonstration of the single-transfer process. Mr. Kough, although an experienced amateur photographer, had, until quite recently, not worked the process. He showed the first batch of prints which he had taken, from which it would appear that a full measure of success at the first time of asking is quite possible with the carbon process, as it is erroneously called. As regards a fancied trouble due to an exaggerated notion of the want of keeping quality in the paper, Mr. Kough showed prints which were developed seven days after exposure, and seemed none the worse for the keeping; the so-called continuing action had apparently not appreciably injured the image. From what was shown by Mr. Kough, it would appear that the process is easier and more certain — certainly immeasurably more delightful and permanent than any of the print-out silver processes. Mr. G. W. JENKINS followed by illustrating the system known as double transfer. In this he showed, by using two prints, how the print was squeegeed on to the temporary support,

developed, and transferred to the final support. The various proceedings attracted the close attention of a large gathering of members, who also inspected a number of pigment prints shown by various workers, including a dozen large-size pictures which were kindly lent by the Autotype Company, amongst these being an enlargement of Colonel Gale's well-known *Sleepy Hollow*. Mr. F. WRATTEN having made some valued suggestions, it was announced that Mr. Taylor had presented a large framed enlargement of a frenagraph by himself of the wrecked Chain Pier of Brighton, and Mr. Pusey a set of four admirable prints, also framed, taken at Hatfield. The elections of Messrs. Herbert Woodcock and Robert H. Fuller were notified. A large number of those present gave in their names to attend the annual dinner on the 17th, which promises to be an even greater success than that of last year.

Hackney Photographic Society.—March 5.—The Annual General Meeting of this Society was held on Tuesday, the 2nd instant, Mr. Thomas Bedding presiding. The report of the Council and balance-sheet were highly satisfactory, the latter showing a large balance to the credit of the Society. The result of election of executive was as follows:—*President:* Major C. Woolmer Williams.—*Council:* Messrs. L. S. Wilks, E. Puttock, A. Barker, F. W. Gosling, W. Rawlings, J. J. Westcott, J. Wilmer-Cole, and C. T. Fleetwood. —*Hon Lanternist:* Dr. Roland Smith.—*Hon. Librarian:* Mr. A. Dean.—*Hon Treasurer:* Mr. W. L. Barker.—*Hon. Secretary:* Mr. W. F. Fenton-Jones.—*Hon. Assistant-Secretary:* Mr. A. D. Fort.

Putney Photographic Society.—March 1, Mr. W. C. Plank in the chair.—Mr. W. J. COLEBROOK gave a paper on

INSTANTANEOUS PHOTOGRAPHY.

The subject was divided into two parts, the first part dealing with the usual method of taking instantaneous photographs by having the object in a bright light and uncovering and covering the aperture of the lens very rapidly. The second part dealt with photographs taken in the dark, the object being illuminated by a flash of light of very short duration. Some very good slides illustrating the first method were shown; some, lent by Mr. Wm. Martin, taken with exposures ranging from one-fifteenth to one-sixtieth of a second; and some, lent by Messrs. Thornton & Pickard, with exposures from one-fifteenth to one-five hundredth of a second. Of the second method slides were shown of objects taken by a magnesium flash, the lecturer then proceeding to deal with the later methods of photography by the aid of the electric spark. The advantages of this method were mentioned, viz., the great brilliancy and the short duration, but it was pointed out that glass absorbs a large proportion of the light from the spark, so that it is a matter of difficulty to obtain photographs when using the ordinary camera lens. The method usually employed when a camera lens has to be used is to use a large condenser to condense the light from the spark into the camera lens, the object to be photographed being placed close to the condenser. The lecturer showed some photographs taken by himself, in which no condenser was used, a piece of ground glass only being used to diffuse the light. The lighting in this case was, of course, far inferior to the condenser method, rough, comparative measurements showing that about eighteen times more light was available when using a six-inch condenser than when using the ground glass alone. Photographs were shown of jets of water, the first one taken with an exposure of one-fiftieth of a second to a bright light, and showing the jet as it is visible to the eye; the others were taken by means of an electric spark, showing that the jet is really made up of separate drops, which pass so rapidly before the eye as to appear continuous. A photograph of a soap bubble in the act of breaking was also shown, it being mentioned that the broken edge would travel at the speed of about seventy miles per hour, and would therefore travel across the ring on which it was supported in one three-hundredth part of a second. The question of the duration of the spark was then discussed, and the methods of measuring such short intervals of time described. Some photographs of sparks were shown, the duration of one being only the one ten-millionth part of a second. Some of Prof. Boys's bullet photographs, in which the exposures varied between one five-millionth and one ten-millionth of a second, were then shown and briefly explained.

Bath Photographic Society.—February 24, Annual General Meeting, Mr. Geo. F. Powell (President) in the chair.—The HON. SECRETARY read the report, from which the following are extracts:—The Society has been again fortunate in securing some useful lectures; the attendance has decidedly improved, while payment for admission by non-members has been on the increase. The lecture evenings have been varied by the interspersing of others of a technical and informal character, and a further departure on two occasions enabled those who desired to do so to smoke as well as talk. Both the informal, technical, and smoking meetings proved successful. Excursions have received more support than usual; this may have been attributable to the popularity of the places chosen, as well as to the lucid information given in papers read before the Society concerning the chief points of interest of each. Judged from a momentary point of view, the dark room can hardly be said to have fulfilled the Committee's anticipations. It is seldom used by ordinary members, and the subscriptions received from temporary members are still very small, while the rent payable for this portion of the Society's holding is disproportionately high, and it becomes a question whether the slender income of the Society continues to warrant the outlay. The Committee fully recognise the inexpediency of depriving those who require it the use of a suitable dark room, and they have this question under consideration. Dr. Norman gave us a most interesting and illustrated lecture, which he entitled *A Trip to the Baltic*. The President gave us notes on South Wraxhall and Great Chaldfield, with a view to an early excursion thereto. For similar purposes Mr. Austin King read an instructive paper on Wardour Castle, dealing with ancient and modern details useful to photographers. Mr. King also delivered a short lecture on the *Ruins of Glastonbury*. Dr. Norman read a very carefully prepared *Memoir on Tintern*, and he detailed much useful information respecting Raglan Castle, Berkley Castle, and sharpness. Colonel Seeley gave a popular lecture on South Devon, illustrated from his recent negatives. Mr. Austin King contributed further with a popular lecture on *Madeira*, illustrated with coloured slides from his recent negatives. The Rev. Purvis practically demonstrated the use of an incandescent gas burner for enlarging purposes. During the summer recess the following excursions were arranged and took place:—rail to Raglan Castle and Monmouth, returning *vid* the valley of the Wye; brake to Great Chaldfield and South Wraxhall; by rail and brake to Ward Castle; to Bradford-on-Avon by kind invitation of Dr. Sudlow; and, lastly, Glastonbury by the S. and D. Railway. The audited cash account show that the income from subscriptions had been 25*l.* 8*s.*, profit on Mr. Giffor lecture, 9*l.* 15*s.* 10*d.*; sundry other payments, 2*l.* 4*s.*; balance from last ye 6*s.* 8*d.*, making a total of 37*l.* 14*s.* 6*d.* The outlay had been 36*l.* 14*s.* 6 leaving a balance of 1*l.* to carry forward. Upon the proposition of t CHAIRMAN, seconded by Mr. J. R. SOMMERVILLE, the report and balance-sh was adopted. Colonel Sealy having taken the chair, Mr. APPLEBY propos and Mr. ASHMAN seconded, the re-election of Mr. G. F. POWELL as Preside —Carried. Mr. POWELL thanked the meeting for the honour done him. D. P. WILLIAMS proposed Messrs. Appleby and Lambert be re-elected Vi Presidents. Mr. POWELL seconded.—Carried. The CHAIRMAN propose Mr. M. H. SCOTT seconded, the re-election of Mr. Appleby as librarian a Mr. Perren as curator of the dark room.—Carried. The Rev. R. H. MCCHEA proposed, and Mr. J. R. SOMMERVILLE seconded, the re-election of the Co mittee as follows:—Austin J. King, Aug. F. Perren, Dr. Norman, Rev. E. Purvis, Colonel Sealey, the Very Rev. Monsignor Williams, D. Pr Williams, W. Pumphrey (permanent member of Committee).—Carried. the proposition of Mr. APPLEBY, seconded by Colonel SEALY, Mr. W. Midd ton Ashman was re-elected Hon. Secretary and Treasurer, with thanks past services.—Carried. This closed the formal business, after which M PERCY BATE read a paper entitled *Some Masterpieces by Bath Artists.* T was illustrated by lantern slides. The CHAIRMAN thanked Mr. Bate for paper, which was full of interest to photographers. Mr. HOBSON regrett former corporations had not seen fit to secure some of the pictures illustrat by the lecturer. He hoped it was not too late to get some for the art collecti under consideration by the authorities. Mrs. WHEATCROFT thought, in p viding a representative collection in an art gallery, painters of the present a future should be considered as well as painters of the past, and that enc ragement should be given to bring pictures from a distance. Mr. MEEH wished to add his quota of thanks to Mr. Bate for the nice terms of his pa and the pretty illustrations chosen. He regretted that the fine work produc by Bath artists was going away with little chance of its return. Mr. MIDDL TON ASHMAN, referring to the illustrations given, spoke of the marked similar in lighting and posing between portraits of the elder Barker and portraits p duced by photographers at the present day, while others of a softer a flatter character more nearly resembled, as far as lighting was concerned, beginner's attempts to photograph his friends in the garden. He contrast this against the force of strong light and shadow in others, and asked whi school photographers should follow. Mr. BATE, in reply, thanked the speak for the reception accorded his paper. He thought artists had the advantage being able to paint out anything they did not approve of while the camera w perverse enough to record it.

Leeds Camera Club.—March 3.—A set of affiliation (Royal Photograph Society) slides, made by members of the Holborn Camera Club, was show The L.C.C. competition slides were also passed through the lantern, and it w decided that the judging should be done at some future date by a non-meml of the Society. Afterwards Mr. Bourke described and manipulated a cinem tograph of very simple design, a number of films being run through the machi One or two competitors severely "heckled" the Chairman (Mr. Barnes) a his co-Judges in respect to the adjudication of the competition prints, an very animated debate followed on the correct reading of the competition rul On Wednesday evening, the 17th inst., a lecture and demonstration on t *Development of Films* will be given by Mr. Bullen, the representative of t "Gem" Plate Company, Limited. The Fourth Annual Social Evening and Dan will take place in Trinity Church School-rooms, Trinity-street, Boar-lane, Thursday evening, the 25th inst. Mr. Horsley Hinton will deliver his lectu entitled *Pictorial Photography*, on April 23.

Sheffield Photographic Society.—February 2, the President (Mr. Tomlinso occupied the chair.—Mr. D. C. BROOKS delivered a lecture on

EXPOSURE AND DEVELOPMENT.

Dealing chiefly with the subject of exposure, he pointed out the vari factors which affect the same. The method of using the Watkins exposu meter was carefully explained. The lecturer strongly recommended the of this instrument, and showed that by the aid of it a correct exposure can given under any conditions, and, if a correct exposure be given, no variatio required in the component parts of the developer, and he argued that t exposure should be made to suit the developer, and not, as is usually the ca the plate developed to suit the exposure, and as proof of this a number prints from negatives, taken under various conditions by aid of the met were exhibited, all the negatives having been developed with the same streng developer, and the gradation and detail in the prints certainly proved t lecturer's theory to be correct.

Wolverhampton Photographic Society.—March 2.—A lecture was d livered at the Society's rooms by Mr. H. E. PERRY, the title being,

FROM NEWBRIDGE TO EVESHAM BY WATER,

being an account of a fortnight's boating trip on the rivers Severn and Av in last summer, the party camping out on the way. Starting from Newbridg Tettenhall, in a small steamer, they proceeded along the canal by the Bratc Stewponey, Kinver, and Kidderminster to Stourport, along the Seve through Worcester to Tewkesbury, and thence by the Avon to Eveshar Further progress in that direction was prevented by the unnavigable conditi of the locks and the river, and the party returned the way they went. some places they had to wait at a lock while a mile and a half of river was fill with water. Allusion was made to the injurious monopoly of the railwa companies in acquiring possession of the waterways of the country, a allowing them to fall into decay and disuse. The lecture was profusely illu trated by lantern slides made by Mr. Perry from negatives taken by him d the journey. There were examples of the scenery of the canal and some of i thirty-two locks, the Cookley Tunnel, the rock dwellings at Kinver, Redston

d Arley, and St. Mary's Church, Kidderminster. There were some beautiful amples of the Severn scenery, some showing the seaworn cliffs of the new d sandstone, including the isolated Peckett Rock at Habberley Valley, that arks the course of the arm of the sea that in glacial times separated Wales om England. Worcester and its cathedral, Tewkesbury and its abbey, ipple, Deerhurst, Breedon, Evesham and its bell tower, and other interesting aces were thrown upon the screen and described with historical references id amusing anecdotes. A few pictures of Warwick were also shown. The tendance was not large, owing to the inclemency of the weather; but the eeting otherwise was very gratifying, and a hearty vote of thanks was accorded the lecturer, on the motion of Mr. HOLCROFT.

Edinburgh Photographic Society.—March 3, Mr. F. P. Moffat presiding. Mr. W. PENMAN, C.E., gave a paper entitled

SOME USES OF THE CAMERA TO AN ENGINEER,

which he pointed out the many ways in which the camera was a great help the engineer's business. When a number of works were in hand at the me time, and in different parts of the country, the camera was most useful obtaining records of these works from time to time. Mr. PENMAN explained iat photographs were often found useful in law courts. In the discussion hich followed several members expressed the opinion that photographs were ot taken as very reliable evidence. A large number of slides were used to ustrate the paper. Mr. E. L. BROWN then read a paper entitled,

A RAMBLE IN NORTH WALES.

his paper was very enjoyable, and Mr. Brown showed about fifty excellent ides.

THE second Popular Evening of the Society was held on February 26, when r. LAMOND HOWIE gave a lecture illustrated by a magnificent set of slides. he lecture was on Alpine travel, and entitled,

FROM MONT BLANC TO THE MATTERHORN.

here was a crowded audience.

FORTHCOMING EXHIBITIONS.

1897.	
arch 12, 13	South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
pril 3–May 1	*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.
,, 19	Beverley Photographic and Sketching Society. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE KINESIGRAPH.

To the EDITORS.

GENTLEMEN,—In rummaging over back numbers of THE BRITISH OURNAL OF PHOTOGRAPHY, my eye has only just fallen upon a paragraph February 5) signed G. R. Baker, in which the writer says "The largest ze English film picture I have seen in commercial apparatus (for taking nimated photographs) is 32 mm. by 25 mm., but in the original apparatus atented (viz. Crofts'), the films were nearly three inches square, and the xposures made at the rate of seven to twelve per second."

So far, so good; but what follows is somewhat confusing and misleading. He continues: "It seems a great pity that this machine, on which much time and thought were spent, should have been allowed to lapse, rimarily on account of the death of the inventor."

Now, sir, I object to being murdered in this cold-blooded way by Mr. aker. If he will refer to the original patent, he will find that it was ranted to W. Donisthorpe and W. C. Crofts. The latter gentleman was good draughtsman, and I agreed to give him a interest in my invention consideration of his making the working drawings and supervising the onstruction of the instrument, as I was at that time very busy with her work. He never claimed to be the inventor, nor can I imagine hat could have led Mr. Baker to have selected the *second* name on the atent and assumed that he must have invented the subject thereof. I vented the instrument long before Mr. Crofts even saw it, or thought such a thing. In fact he knew nothing whatever about either optics photography until he undertook my Kinesigraphy in 1889.

Mr. Baker thinks it a pity that "no business man was sufficiently nterprising at the time to buy the patent right from the widow."

The English patent expired before Mr. Crofts' death in November, 894, and fortunately he left no widow to mourn his loss.

Mr. Baker must have but a slight acquaintance witth the typical siness man if he supposes that one of the species would have been sposed to embark in a speculation of such a nature. If such a person ists, I still possess the American rights, but lack the time and the eans to profit by them.

One or two millionaires were, it is true, "approached," with a view to e commercial development of the patent. Amongst others, Mr. Crofts id myself submitted the matter to two "experts," selected by Sir George ewnes, to pronounce on its merits. One (I afterwards learnt) was an tist, a painter, who was as ignorant of the physical sciences as Noah's andmother; and the other was, I believe, a magic-lantern maker.

I need hardly tell you that both these "experts" reported adversely. They agreed that the idea was wild, visionary, and ridiculous, and that the only result of attempting to photograph motion would be an indescribable blur.

What could Sir George Newnes do in the face of such "expert" testimony?

His advisers are now anxious to explain that what they meant was that the scheme was impracticable *at the time*. Let them, however, speak for themselves. I still have Sir George's letter on their adverse report.

I am quite sure Mr. Baker wishes to be just and fair, and I shall therefore ask him in future to give me all I shall ever get in return for my time and thought, namely, the credit of having been the first to invent, and the first to patent the kinesigraph, the photography of motion.

A point of interest to the trade, and to the public, would seem to be, How far are subsequent patents valid as against any one who should choose to manufacture and exhibit my invention?

I should not, as a barrister, care to have to defend the monopoly in this country of any of the patentees since 1889.

I shall be much obliged to you, if you will allow me to make the above claim in your columns.—I am, yours, &c., WORDSWORTH DONISTHORPE.

The Willows, Kintbury, Berks, March 7, 1897.

BLUE-TINTED LANTERN SLIDES.

To the EDITORS.

GENTLEMEN,—In your Correspondence column W. & Co. want instructions for making transparencies in blue. The following process may suit them, and, I think, may be new to your readers:—

Make an ordinary transparency by pyro-ammonia development on a Thomas lantern plate, fix thoroughly in fresh hypo, wash well, and, to get rid of the last traces of hypo, soak the plate for thirty seconds in water made faintly pink with permanganate of potash and very slightly acidified with hydrochloric acid; again wash well.

Now make a saturated solution of ferric chloride and also a saturated solution of ferricyanide of potassium, add ten to twenty drops of each to an ounce of water, and in this mixture immerse the transparency. This operation should take place in subdued light or the light may be slightly tinted.

The image will gradually change colour, and in time become a deep blue. When sufficiently toned, wash, first, with slightly acidified water, and, finally, with pure water. The toned image will be grainless and, as far as a year's experience goes, permanent.

I have found this method of toning useful for lantern slides representing glacier and snow scenes.

The same procedure may be used for toning bromide prints.—I am, yours, &c., W. B. FERGUSON.

Camera Club, Charing Cross-road, W.C., March 5, 1897.

PHOTOGRAPHING BEAUTY.

To the EDITORS.

GENTLEMEN,—I dare say the question asked by Mr. Smith is one that has arisen in many minds during the last week. It is one, however, that, for obvious reasons, I must refuse to answer. Some few years ago a discussion was started in *Answers* on the subject, "Which is the Second City in Britain," and readers will perhaps remember the enormous amount of letters that were sent to the editor on the question; there were, I believe, as many as a dozen towns that claimed the second place! An answer to Mr. Smith would, I fear, bring about a much more extensive and useless discussion, as I do not doubt, for one moment, that each town in the kingdom would claim to produce the most perfect beauty.

Taking English counties alone—I have visited but twelve of them out of the possible forty—it would therefore be unwise and most ridiculous of me to say that I found the most perfect beauty in a certain county when I have not visited the whole. I would prefer to leave the matter of selection in the hands of all photographers, and for each to believe that his own town is the most fruitful.

I am amused at "Actro-Photo's" letter, which I look upon as a joke. I will not discuss the point in these pages as it is not a photographic subject; besides, I am a single young man, and—but stay, happy thought!—if A. P. cares to write to me privately on the subject, I will bring what little medical knowledge I possess to bear upon the question, and I don't doubt but what we shall come to a very amicable settlement. —I am, yours, &c., RICHARD PENLAKE.

Cambridge.

PHOTOGRAPHY AND DECENCY.

To the EDITORS.

GENTLEMEN,—The fairness which characterises the English press will, I am sure, allow the few remarks I have to make to appear in your next issue.

A few days ago I wrote a letter to the Bristol *Times and Mirror*, headed "Photography and Decency," which letter was accompanied by a photograph for the editor's inspection. A copy of the letter you have seen, but the photograph you have not. My letter was essentially critical. It is a

canon of faith with me that no man should talk about what he does not understand, and no critic should sit in judgment upon any work until he knows the means by which it is produced, and the limitation of its power. Pray do not think it egotism on my part when I say I have claim to write the letter that has called forth the sneers of your writer, "Cosmos."

From 1852 to 1855, I was closely connected with photography, then in its infancy, and have been in touch with it to the present day. I have also from time to time been privileged to record through the public press its advance and its high capabilities from an artistic point of view, for good and useful work.

It appears to me, sir, that it would have been more generous in "Cosmos" to have given your readers the opportunity of perusing my letter before indulging in an old and vulgar American metaphor, forgetting that the language of a critic should be the language of a gentleman.—I am, yours, &c., EASTFIELD.

Clifton, Bristol, March 2, 1897.

To the EDITORS.

GENTLEMEN,—The correspondent to the *Bristol Times and Mirror* must hand up the biscuit, for the aureola of modesty has left him and gone nearer the North Pole. It was last seen hovering around the head of a provincial editor, and why? I cannot say for truth, unless it be that he complains of a contemporary, which, says the modern St. Matthew, publishes "a miserable jingle . . . . the style and metre of a music-hall ballad." Has he no sense of humour? Surely something is wanted at times to liven up "the usual thing," which, by the way, is very often too dry or otherwise unpalatable.

The above will, perhaps, pass muster; but later on, in the same issue, in criticising a photograph (reproduced), the same writer, presumably, says, in reference thereto, "I make no apology for drawing attention to the child's underclothing. This *always* looks careless and untidy, and should never appear except at the neck and wrists." (?) This fairly takes the biscuit—not only the biscuit but the whole tin of them. *I* make no apology in saying here that "this," as he pathetically alludes to it, simply means frilling that appears round a little child's legs. The child looks about three years of age, and of the feminine sex. Criticising has, indeed, come to a high pitch of excellence if we are to be told where females are to wear frilling. Has the said editor's cook aver dared to send up to her master's table a leg of ham decorated with frilling? I trust not, or the poor girl is to be pitied.

I have seriously thought of having a notice put on my price-lists to the effect that "no frilling must appear on a child elsewhere than at the neck and wrists." If I do, I will let you know how it answers; and yet I don't know. Suppose we encourage frilling to show on the lower parts of the human form, the question arises, "At what age are we to——?" I have just been called out to pay the tax-collector, and I noticed on one of the coins the motto, "Honi soit qui mal y pense." I will have that printed and hung in my studio, and, as a companion, "Accensa domo proximi, tua quoque periclitatur," so I will say no more. I am, yours, &c., HERCULES.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Frank Reynolds, 29, High-street, Bognor, Sussex.—*Two photographs of destruction of Bognor Station on March* 3, 1897.

Lewis Medland, Kimberley, North Finchley, N.—*Photograph of Henrick Lindahl, the Norwegian, skating at Hendon on February* 5, 1895, *in the international professional one-mile race.*

Edgar Allen Basebe, 234, Mill-road, Cambridge.—*Wash drawing of a College under graduate seated with lady under a shed, with boys on top of said shed. Proctor and "Bull Dogs" in background.*

RECEIVED.—NOVICE; CYANIDE; ALFA; CURCUMA. In our next.

REV. L. MACDONA.—The letter was duly forwarded to the gentleman named.

PLYMOUTH.—In such cases prompt payment is usual. We should advise you to apply pressure.

TECHNICAL.—We should recommend you to apply to such firms as Marion & Co., who undertake publication work. The copyright is, we believe, usually disposed of outright, but there is no recognised rule on the point.

COPPER PRINTING.—RUHTOCK. We have had no experience with the process quoted. We should advise you to try sizeing the drawing paper with a weak solution of gelatine; also, by way of experiment, thin starch paste.

ALPHA.—Your only remedy lies in proceedings for illegal detention of the negatives. However, if you lay the facts before the local superintendent of police, he may possibly be able to help you. This plan has answered in similar cases.

"ST. PETERS."—Let us know the name of the publication, and we shall be in a better position to advise you.

GELATINO-CHLORIDE PAPER.—J. WARNER. You have been doing two things that are incompatible with the use of gelatine paper—drying between blotting paper under pressure, and drying before the fire. Let the prints dry spontaneously, either lying flat or pinned up by a corner.

MATERIAL FOR BLINDS.—BLINDS asks: "Will you please say if enclosed patterns are suitable for blinds, and which is the best, the light or dark or if any other colour is preferable? Studio aspect south-east, ground glass."—For a south-east aspect we should advise the darker of the two but it would be better to have it thicker, if you can procure it. The colour is suitable, but the material is a little thin.

APPRENTICE.—S. E. R. The "apprentice" is quite in the right. As the indenture is not stamped, it is not binding on him any more than it is on you. You have no hold upon him in any way, and he is only an ordinary weekly servant, and can leave when he likes by giving a week's notice. By not having the indentures stamped, you evidently thought you would have a hold upon the lad while he had none on you, but that is not the case.

AJAX.—To photograph an object same size, the distance between the subject and the lens, and the lens and the sensitive plate, must be, approximately, double the focal length of the lens employed. Thus, with the lenses you name, the distances would be nineteen inches and nine inches respectively. With the fourteen-inch lens, a camera draw of twenty-eight inches would be required. Of the three, the four-and-a-half-inch is obviously the more suitable.

REPAIRS.—ONE IN DOUBT. As you have the premises on a fourteen years lease, there is very little doubt but that the repairs have to be done by the tenant. Have you not read through the terms of the lease? The tenant to whom the lease was granted in the first instance being dead makes no difference. When you bought the business and the lease of the widow, you bought it with the conditions it contains, and you will have to abide by them whatever they may be.

CARBON PRINTING.—OXO. The reticulation is apparently due to the tissue, it not being in the proper condition at the time it was used; or it may be that too hot water was used for the development. It may be mentioned that carbon prints, when developed on glass, are rather more prone to reticulate than when they are developed on, say, single transfer paper, particularly if the tissue is not collodionised beforehand and the glass has not a substratum upon it.

A CONSTANT READER.—1. By setting the lenses closer together in the mount, the covering power is increased, but you make the field rounder. If you are really desirous of making the experiment, a working optician might be able to make the necessary alteration in the mount, but we should advise you not to tamper with the lens. Have you tested its covering power with the smallest stop? 2. Practically, yes, other things being equal. 3. We note your suggestion.

FIRE INSURANCE.—A. H. CADE writes: "Can you give me the rate quoted by fire insurance companies for photographers, to include house with studio above, apparatus, &c.? Here 5*s.* is asked per 100*l.*, but I thought that in London, since dry plates, the rate was lower."—We think the rate quoted moderate, and imagine that it is less than that charged to many photographers in London. The Westminster Office is credited with being very liberal as regards photographers' premiums. Write to it for a quotation.

"PUSS."—1. Practically, we believe, according to the Berne Convention, in all European countries and British colonies. 2. Yes. 3. It is impossible for us to answer this question. You could only ascertain the average value by offering the pictures to a number of publishers. 4. We are doubtful whether the design could be registered. However, application to the Trade Marks department of the Patent Office, Southampton-buildings, Chancery-lane, will bring the desired information. Thanks for the photograph, which is capital.

COLOURING FROM THE BACK.—MOTHER. We should certainly not advise you to pay 10*l.* for your daughter to be taught "the new system of colouring photographs," from the back, with the view to her making it a source of livelihood. Many needy ladies, in times past, have been deluded into paying sums of money to learn that style of colouring, on the representation that there would be employment for them, only to find that they have been basely deceived. Put the money to some other and more useful purpose. No apology is necessary for troubling us on the subject.

R. DE C.—1. We would suggest 20 in. approximately. We do not think the lead piping necessary. 2. One would suffice; but two flames, the burners placed at right angles, would be better. The light is then practically equal to a blow-through jet. 3. About 1½ pounds of carbide, the size of tin being approximately 5 in. deep and 3 in. broad. 4. A purifier is not absolutely necessary. 5. The arrangement sketched, we think, would be safe; the holder containing the carbide should, however, be lowered considerably, so that the water the more readily makes contact with the salt.

SPOTTY PRINT.—ANXIOUS writes as follows: "I enclose a print, showing peculiar markings all over. Have you seen anything like it before, and, if so, can you explain cause, as the markings have been bothering me for some time past, and I cannot solve the mystery? There is no sign of the markings during the toning, fixing, and mounting operations, but, when the prints are dry, then they can be seen."—There is very little doubt that the spots are due to particles of pernicious matter settling on the print when it is in a wet or moist state. The lights and the margin of the print show spots of a more pronounced type, though smaller, than those on the image itself, and these can be scraped off; but, apparently where they have come in contact with the image, they have produced a spot more akin to a stain.

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EX CATHEDRÂ.

The greatest difficulty which the Royal Photographic Society will have to encounter in the organization of the International Technical and Trade Exhibition of 1898 will be that of obtaining premises suitably situated and large enough to meet the special requirements of the case. So far, we believe, the Committee appointed to deal with the matter have not been able to come to a decision. We learn that the executive of the Crystal Palace are very desirous that the Exhibition should be held at Sydenham, and are prepared to deal in a liberal spirit with the organizers of the Exhibition and those supporting it. The possibility of the Crystal Palace serving as the venue of the Exhibition may therefore deserve sympathetic consideration.

* * *

From a letter published in our Correspondence columns, it will be perceived that the Royal Photographic Society invite the loan of photographic apparatus, or examples of processes of historical interest, to form part of the Victorian Exhibition to be held at Earl's Court during the approaching summer. The Council have agreed to lend some of the contents of the Society's museum for the purpose.

We may also draw attention to the fact that, in commemoration of the "longest reign," the Directors of the Crystal Palace have decided to organize, among other attractions for the summer, a Victorian Loan Exhibition, illustrated by historical and modern specimens, original models, and practical examples. Photography and its applications are classed with the Famous Inventions Section, and Messrs. Negretti & Zambra, of the Crystal Palace, who have charge of the section, invite the loan of apparatus or specimens. The Exhibition is to be opened on May 24.

* * *

Mr. Lafosse, of Ilfracombe, a son of the well-known Chevalier Lafosse, formerly of Manchester, and who is now devoting himself exclusively to landscape and seascape work at Ilfracombe, has submitted to us a number of views and portraits in platinum. These have a very effective sepia tone, which may at will be obtained either cold or warm, and are comparable to the best sepia colours in carbon printing. The means employed for imparting these very agreeable and rich sepia tones to the platinum print consist in a modification of the oxalate solution. It is the intention of Mr. Lafosse to impart the process to his brother professionals only.

* * *

The Camera Club was the scene, on Wednesday evening, March 10, of a dinner to the retiring Honorary Secretary, Mr. R. W. Cox, whose ill health compels him to relinquish his post. In the absence of the President, Mr. F. Machell Smith took the chair, and was supported by many members and visitors, among those present being Mr. G. Davison, Mr. A. Strob, Mr. J. W. Godfrey, Mr. Lyonel Clark, Mr. F. E. Ives, Major Purchase, Major Lysaght, Mr. Dallmeyer, Mr. Powles, Professor H. E. Armstrong, Mr. R. W. Craigie, Mr. Horsley Hinton, Mr. Bedding, and many others. Besides the usual complimentary toasts, Professor Armstrong, in submitting that of "The Camera Club," took occasion to review its work and position, declaring it to be of national importance. The Professor's remarks met with the cordial endorsement of those present.

* * *

Messrs. R. & J. Beck write: "You are probably aware that for a long time past we have been extremely anxious that a new support could be found for films of a less costly nature than celluloid, which should enable us to

put Frena films on the market at a lower price. This has now been done, and we are introducing Setoloid films, cut and supplied for the Frena, which, however, may be used equally well in any other camera. Setoloid was put upon the market in a tentative manner for use in our smallest-size Frena a few months ago, but the material has now been perfected, and we are introducing it in all sizes. It is the same thickness and consistency as celluloid, and lies perfectly flat during development and exposure. It has a fine, matt surface, and is in no way inferior to the best celluloid films. The films are supplied with the Austin-Edwards' two most rapid speeds of emulsion—the Austin-Edwards' Instantaneous, and the Austin-Edwards' Double Instantaneous, the speed being respectively 90 and 128 by Wynne's Exposure Meter, or 100 and 150 by Watkins's Exposure Meter. We enclose price-list, by which you will see that Setoloid Frena films are now no more expensive than celluloid ordinary cut films."

* * *

An examination of the negative sent places us in a position to confirm all that Messrs. Beck claim for Setoloid as a support for the sensitive film.

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We had the pleasure recently of cursorily inspecting the premises at No. 167, Strand, W.C., in which Messrs. J. Bulbeck & Co., whose architectural work has already won them a high reputation, have just commenced business as architectural and technical photographers. A well-lighted and beautifully fitted suite of rooms has been selected by Messrs. Bulbeck. The dark rooms, the studio, and the facilities for development and printing are unique in their completeness and refinement of detail; the firm's apparatus and lenses are of the very best modern kind, and no trouble or expense has been spared to make the photographic equipment in all respects of the highest efficiency, and such as will promote the firm's aim to produce the very best technical results.

PAPER NEGATIVES, PAST AND PRESENT.

The specification of a patent we gave in our issue of last week, once more illustrates the need for reform in the way that patents are granted in England. Herr Oswald Moh's "invention," unless the specification has suffered badly in translation into English, is solely for a part only of the method adopted in the very first process for taking photographic negatives, namely, Fox Talbot's calotype process of 1839. In that process the material employed was paper, and, after the negatives had been developed, fixed, and dried, the paper was rendered translucent, to facilitate the printing. For this the specification of a patent has just been accepted, and the fees taken, at the Patent Office. Wherein, one naturally speculates, does Herr Moh's "new" invention differ from the method of Talbot of nearly sixty years ago, or indeed that of every worker of paper negatives ever since that period, barring the waxed paper process, for that does differ from calotype, though in detail only? These two processes—calotype and waxed paper—it may be mentioned, however, are often confounded as being the same, by some modern writers.

It is a little surprising that paper for negatives is so comparatively little used at the present time. Not surprising, perhaps, as regards camera exposures, but for enlarged negatives, to be printed from either in carbon, or for platinotype, particularly by amateurs. Thin laid paper would be easier to manipulate than large glass plates, and is much cheaper, also the finished paper negatives would be more convenient to store than glass ones. One reason why paper is not more used, possibly, is that there is a very prevalent idea that the grain of the paper must, necessarily, show conspicuously in the finished prints. This is not the case, however, with the papers now supplied for negatives. In the early days it did, though not to the extent that many now surmise. As a matter of fact, the calotype process was for a long time the only process for negatives, and it was successfully used by professionals for portraiture.

Let us look back to the old paper negative processes and we shall then see how they differed from the modern gelatino-bromide papers as regards granularity. In the calotype process, plain paper was brushed over in the first instance with a solution of nitrate of silver, and then partially dried. It was then treated with a solution of an iodide, and afterwards washed and then dried. The paper had next to be sensitised with the gallo-nitrate of silver. Now, it will be seen that in this process the image, when developed, was in the substance of the paper itself; also that the even texture of its surface was necessarily much interfered with by the different operations, some of which were by brushing on the various solutions. When the negatives were finished, they were made translucent with wax for printing.

In the waxed-paper process the procedure was different, as the paper was saturated evenly with wax in the first instance, and, to facilitate its permeation, it was very customary to treat the paper with hot water, sometimes acidified, to remove some of the sizing material, and thus make it more porous. The iodising of the paper was conducted by long soaking in a solution of the iodide, and the sensitising by floating on the aceto-nitrate of silver. The development was generally done by immersion, often for hours; the fixing in the same way.

It will now readily be seen that in both processes, though they differed in details, the images were *in* the body of the paper; also that the treatment it was subjected to in the different operations was such as would very materially disturb the even texture of the surface, however fine it might be to begin with, and thus render the fibre the more pronounced. When all this is considered, it is not surprising that the texture of the paper in the old negatives did show in the prints; but, as we have said before, it was far less than many might surmise.

With modern negative papers the conditions are widely different. Here we have this paper to all intents and purposes intact, and the image, instead of being in the body of the material, is simply confined to the film of gelatine upon the surface, under the same conditions as it is on a glass plate or on a celluloid film. The paper merely acts as a support for the vehicle (gelatine), which carries the bromide of silver; and, theoretically, there should be no texture at all. In practice, however, when the print is finished, there is generally a slight indication of one, due to the paper support not being completely homogeneous.

The question has often been mooted as to whether rendering the paper backing of modern bromide paper translucent with such things as wax, vaseline, oil, &c., is an advantage in ameliorating the granulation of the paper or not. Opinions on the subject differ. Some say it does, while others, on the contrary, assert that it makes the fibre of the paper more conspicuous. Something, however, may depend upon the characteristics of the paper itself. So far as our experience goes,

making the paper translucent does not lessen granularity, and this in the modern papers, as we have just intimated, may be considered as practically *nil*. The only advantage we have found in rendering the paper translucent is to facilitate the printing, and nothing beyond that.

THE PROFITS OF PROFESSIONAL PHOTOGRAPHY.

Cynics among the profession would say that, if x be taken to represent these profits, a true equation would be $x=0$; the general public rank them as infinite; amateurs as a rule look upon them as very large, but still subject to some slight reduction from total receipts on account of cost of plates and paper, chemicals, &c. We have lately been privileged to hear the views of many professionals, and, without an exception, they inform us that the total percentage of profit left after all outgoings are deducted is very small indeed. Of course, we may take this to be so in a relative sense. A merchant or a large retail trader, whose business amounts to tens of thousands a year, would look, say, upon ten per cent. as a handsome net profit; but, apart from the fact that a photographer looks upon himself—and, in some cases, it must be said, justly—as a professional man, who is paid for the use of his brains more than for the goods he delivers, it must be remembered that, except for a few magnificent exceptions, the gross amount of money taken by a photographer cannot possibly total up to a large amount. Hence he looks for a higher percentage.

It has been put to us that the question may be looked at from two entirely different standpoints. There is first the pure business aspect. Here a photographer opens a studio, does a fair day's work himself, shirking nothing, and asking from his *employés* a fair day's work, for which he gives a fair wage. In fact, the whole concern is worked on pure business principles. A subdivision of this business aspect is the sweating employer. He does nothing himself, but spends his time seeing that all his people work. They come early and go away late; they, in many places, are called upon to work on Sunday also; their labour is incessant and close; every little trick and meanness is employed to reduce weekly salaries; and finally the salary itself is miserably poor. Yet, poor as it is, there are so many unemployed photographic assistants that hundreds of them will be found to snap at the offer of wages that an artisan would scorn. As a matter of fact, a plumber, or a joiner, or even a bricklayer, gets bigger wages than the average printer, or than a very large number of so-called operators. We will not dilate on this subject, which is worthy of special treatment by itself.

The second aspect from which the question may be looked at is what may be termed the family business. Here the photographer is chief operator, and his wife takes charge of the reception room, while, probably, a son is utilised in the printing, and a daughter or two there also, or in mounting and spotting, the whole working for hours of indefinite extent. This is a class of studio where profits are clearly to the fore where business to any amount is actually done; there are no salaries to pay and the dry-plate maker is the chief creditor. We quite feel that this latter class of photographer is no criterion as to photographic possibilities on a broad scale. Where a business of any kind exists, it must be a poor one that does not show a good balance after twelve months' work. In this case, then, we must admit the possibilities of profit.

Turning, now, back to the first-named class of studio, which is what we have heard most discussions upon, our informants seem to be very positive that, as present-day requirements go, expenses mount up to such an enormous extent that, unless the returns are counted by thousands instead of by hundreds, the game is not worth the candle, and readers may form a pretty shrewd guess as to how many of the thousands-pounder type are to be found. We are told that sitters are so exacting that expenses in all sorts of unthought-of directions run up, though strict watch is kept on all outgoings, and that, indeed, if such watch is not kept, the "balance" may be found on the wrong side. As an example, we may say that one gentleman informed us that his weekly wage bill had been about 20*l.*, but the year before he spoke to us his balance-sheet revealed such a state of affairs that he discharged more than half his *employés*. Now, his business could not have fallen off to this extent in one year, hence it is evident that he at any rate had not closely enough, or frequently enough, watched his outgoings and their complementary incomings.

On one occasion that this topic was being discussed, an amateur present said: "Well, I know you can get a half-plate for $2\frac{1}{2}d.$, and a dozen cabinet prints done from it for 4*s.*; so isn't there profit enough left on the 15*s.* a dozen?" "You can get coal at the pit's mouth for less than half its price delivered at your door, and for much less than that if you choose to go and dig it out yourself, yet it is coal all the time," was the reply. "All this difference in cost goes in labour, carriage, wear and tear, and a thousand other ways. Your four-and-twopence-halfpenny makes no allowance for rent and taxes, for salaries, for retouching, for retakes, for packing expenses, stationery, letters, and a thousand other things that do not enter into your unbusinesslike mind." And so on. Eventually one of the disputants promised to make us an imaginary balance-sheet for a man doing 1000*l.* a year, and, as soon as it arrives, our readers shall have the benefit of it, when perhaps we may hear all sides of the question from those who care to criticise.

JOTTINGS.

My suggestion of last autumn that Newquay might become a kind of photographic Mecca has just been enthusiastically endorsed by the little local paper that has stood by Mr. Bennetto and his alleged natural-colour photograph process with a mingled simplicity and determination which goes to prove that the Age of Faith is not dead on the Cornish coast. Possibly, though, the Newquay print should not have been so eager to jump at my suggestion. Mecca, it is true, is a great place of pilgrimage, but of those that set out on the journey vast numbers do not complete it; and of those that reach the bourn and turn back many more do not get home. Let Newquay congratulate itself that it is only a pretty little health resort. My readers, of course, see the point I originally aimed at making, and they very well know that Mahomet is not universally regarded as having been a true prophet. But this by the way.

Mr. Bennetto is taking a long time to patent his process, considering that his results were produced last summer. He also seems quite angry that they should be compared to crystoleum pictures; so that I take it he is unaware that crystoleum pictures can be made to possess extreme beauty, as witness the examples recently exhibited at the Society of Arts. There have been lantern-slide exhibitions of Mr. Bennetto's results at the Grafton Galleries, the Society of Arts, the Camera Club, and the Crystal Palace, and the London and country press has printed a great deal of platitudinous comment on the beauty of the pictures—notably that of a champagne bottle standing on a white table, with the colours of which there appears to be a remarkably unanimous familiarity; but, still

absolutely nothing has yet transpired to substantiate Mr. Bennetto's claims. Every man of the world, who is also a photographer, is entitled to regard Mr. Bennetto's results with what the *Times* calls some degree of philosophical suspicion; and, if some photographers were philosophically suspicious eight months ago, can it be wondered that they are more than sceptical now? How easy it would have been for Mr. Bennetto to do what M. Chassagne did, and give us some reasonable ground for believing that his process was a genuine one!

But no! Several leading scientists were said last summer to have expressed admiration of the process (see this JOURNAL, July 31, 1896); but, up to this moment, the names of these gentlemen have not been revealed. How easy it would have been to give the world a reference to those gentlemen. Mr. Bennetto publicly said (THE BRITISH JOURNAL OF PHOTOGRAPHY, August 14, 1896): "I have shown the results to several persons;" and, on February 26, 1897, p. 143, he stated: "No colour pictures have *ever* left my hands for *any* purpose whatsoever." The two statements, which are literally reproduced, are, to say the least of it, not in harmony, but I will assume that the latter is the correct one. What, then, did the leading scientists admire? A few coloured magic-lantern pictures? And, again, are we to suppose that financial syndicates, who hold little gatherings at West-end galleries late at night for the purpose of exploiting colour processes, do so on the faith of magic-lantern entertainments?

I quoted the *Times* just now. It is commonly believed that unusual pains are taken by that journal to verify alleged discoveries before describing them, and the enormous influence it wields in the world renders some such course imperative. Was that done in this case? Let my readers judge for themselves.

The Times, February 26, 1897.

"He has been put to tests which it is difficult to suppose he could have satisfied did he not in fact do what he claims to do. He was requested to focus his apparatus on an easel. When he had done so, he was blindfolded, and on the easel was placed an impossible picture, painted in impossible colours, which he had never seen before. This he photographed and developed, still without seeing the original, with the result that the impossible colours were reproduced in the photograph obtained."

British Journal of Photography, September 18, 1896.

"Mr. Bennetto being willing to submit himself to a test, the following gentleman agreed to act as a committee, viz., Mr. C. O. Clark, Mr. J. C. Lomax, and Mr. G. Welman. A colour test had been prepared by Mr. Lomax, who is a well-known artist, in the shape of a rough sketch with bands of various colours at the bottom of the sketch. The dates of the week, month, and year were in different colours. As will be seen from the report, Mr. Bennetto was blindfolded, and did not see the original test until he had shown his result and it had been carefully examined by the committee. The following is a copy of their report:—

"On Monday, August 31, 1896, Mr. Bennetto was blindfolded, and photographed in our presence a picture which he had not seen.

"The picture was then sealed up, and he did not see it until after he had shown us the result on Thursday, September 3.

"He then showed us a transparency on glass.

"The exposure had been made in perfect ignorance of the subject, and the focus was not correct; under these circumstances we consider that the result represented the colours of the picture sufficiently to prove that Mr. Bennetto can produce colours by photography in a transparency on glass. We are satisfied that the result was obtained *bonâ fide* by photography alone."

I do not wish to be unjust to Mr. Bennetto, but I am bound to say that if the *Times*, which surely trips in writing of "impossible colours," was content to insert its commendatory article on such evidence as this, it is more easily satisfied in matters of scientific doubt or difficulty than is generally supposed.

Observe that the transparency took three days to produce; and notice how very cautiously the Judges expressed themselves with regard to the quality of the result. These gentlemen were satisfied that the result was obtained *bonâ fide* by photography alone, but it does not appear that they witnessed the development of the negative or the preparation of the transparency; so by what means were they satisfied? It is manifest that they knew nothing of photography. How easy it would have been for Mr. Bennetto to put a photographer on his jury! No wonder we are all still so sceptical as to whether the results are produced by photography alone!

There have been many apologists for the secrecy observed with regard to the Bennetto process; but I can't help feeling that in some instances good nature has been allowed to get the better of discretion. At the present moment Mr. Bennetto's process is a secret one and in the hands of a syndicate, and the public exhibitions of his pictures that have taken place have simply been so many advertisements obtained at a remarkably low rate of payment. I should not be surprised if this precedent of the exploitation of a secret process will not be some day found a very awkward one by those societies where the Bennetto results have been shown. It is decidedly wrong in principle to subject the meeting of a learned society to such uses as this.

But Mr. Bennetto had best make haste to profit by his "discovery," for there are other natural-colour processes afoot, of which the world is likely to hear shortly. As I have said before, I sincerely hope that Mr. Bennetto's process will turn out a success; and, in that case, those that are now sceptical with regard to it will be very easily converted, and those who are already convinced will enjoy the pleasurable feeling that their confidence was justified. What, then, will remain for the world but straightaway to lay at Mr. Bennetto's feet the fame and fortune he will have so well deserved?

COSMOS.

FOREIGN NEWS AND NOTES.

Stained Negatives.—In the *Photographische Mittheilungen*, M. Jljinsky gives a short article in reply to a question concerning the removal of yellow stains from negatives intensified with bichloride of mercury. These stains are due to imperfect fixation, and M. Jljinsky recommends immersing the negatives in a bath of uranium, intensified until the high lights are bluish and the shadows greenish. This requires only a few minutes, and the plates are then washed until all signs of greasiness have disappeared, and afterwards immersed in a weak solution of ammonia. The colour is changed to a greyish black, but the negative does not lose much in density. In the case of stains of long standing it may be necessary to repeat the process several times. By such means the writer has been successful in restoring negatives that had been useless for years.

A REMEDY for stains, due to the contact of printing paper prepared with silver, is given in Lechner's *Mittheilungen*. Such silver stains have generally been thought fatal to the negative, but they may be removed by immersing the plate in a solution of ferricyanide of potassium; but the treatment must be immediate, as soon as the stains begin to appear.

Enlargements for Educational Purposes.—Dr. C. Kaiserling draws attention to the value of enlarged photographs for instruction, especially where micrographs must be used. The want of colour is the chief obstacle, but in practice he has overcome this by quickly tinting the enlarged photograhp. Where, from want of depth of definition and limited field, the photographs are found wanting, they may be combined with drawings. A very suitable material upon which to make enlargements is "photo-linen," as sold by A. Hesekiel & Co. It can be manipulated the same as bromide paper, and it is not liable to tear in use. English manufacturers may find linen, as a support, worth attention.

Colloidal Bromide of Silver.—In the *Photographisches Wochenblatt* there is an article by J. Gaedicke, commenting upon the possibility of silver nitrate and potassium bromide remaining uncombined in a solution of gelatine. On January 22, the writer of an article in THE BRITISH JOURNAL OF PHOTOGRAPHY gave details of an experimental emulsion with a very large proportion of gelatine. This emulsion did not go much past the opalescent stage, and, in the subsequent attempted dialysis, the pores of the septum became clogged, and the silver bromide formed stalactites upon the outside. This was cited as proof that the two salts could remain for very long periods uncombined. J. Gaedicke also held this opinion until it was combated by Cohen in an article in Eder's *Jahrbuch* for 1895, p. 103. Cohen proved, by means of electrical conductivity, that the formation of silver bromide and nitrate of potash is immediate, within the limits of his experiments. With reference to the experiment cited in THE BRITISH JOURNAL OF PHOTOGRAPHY, Gaedicke thinks that the silver bromide was in the colloidal condition and was so held by the viscous solution, and that, upon entering the water, it immediately formed molecular groups and separated. The assumption of bromide of silver in solution is not a violent one, and Schottländer has even prepared metallic gold in such a state that it remained in solution in water and was only precipitated by the addition of salts. Gaedicke also thinks there is no ground to question the capacity of bromide of silver to diffuse in the atomistic state. As Cohen only used a one-third solution of gelatine, whereas Gaedicke, in his experiments, used a much higher percentage of gelatine, the latter thinks the question not yet finally settled. In conclusion he mentions that, if a tube, closed at one end with gold-beater's skin, is filled with a solution of silver nitrate and then immersed in a solution of common salt, in a very short time a stream of silver chloride may be seen to descend and dissolve. The pores of the membrane are soon filled up and diffusion ceases. The membrane is smooth on the inside, but rough outside, which corresponds with the experiment quoted from THE BRITISH JOURNAL OF PHOTOGRAPHY. But the formation of stalactites indicates preferably a longer period of diffusion, and consequently favours the assumption of diffusion of silver bromide, whilst in the case of double decomposition, the formation of stalactites is not attained.

Art and the X Rays.—A curious application of Röntgen's discovery is given in *Die Photographie*. In the art collection of Friedrich Burger of Munich is a picture of Christ's head crowned with thorns, attributed by competent critics to Albert Dürer. It was said to bear the painter's name and date 1521, but neither can now be seen. The Grand Duke of Baden with considerable pains seems to have discovered the monogram and date 1524 on April 6, 1893; but, as the genuineness of the picture was still doubted, the owner requested the painters, Witold and Bruno Haller, who have the only private institute for radiography in Munich, to photograph the picture. After several unsuccessful attempts, they at last succeeded in obtaining an excellent radiograph. The crowned head with lights and shadows, and the nimbus are rendered correctly. Moreover, a Latin inscription, Dürer's small monogram, and the date 1524 are disclosed. The whole picture is traversed vertically with the grain of the wood, and the texture of a silk cloth strained upon the panel is also shown. We shall be glad to see some confirmation of this report.

The Recent Colour Processes.—Dr. H. W. Vogel, in the *Photographische Mittheilungen*, reviews the journalistic methods of persons financially interested in new photographic processes. Instead of communicating first with the photographic journals they turn to the political papers, knowing that the reporters have no practical acquaintance with photographic matters, and are ready to snap up anything of a sensational character. Mr. J. W. Bennetto, of New Quay, Cornwall, does not escape his sarcasm, an account of his photographs in colours having appeared in the German daily press, together with a description of the Villedieu Chassagne process. As the report emanated from a London paper, and was evidently written by some persons only slightly acquainted with photography, Dr. Vogel referred to the last numbers of English and French photographic journals for an account of these latest inventions, but to no purpose. The learned doctor must have overlooked some recent notes in his JOURNAL, otherwise he would not have missed an interesting introduction to Mr. Bennetto. However, a German merchant, upon recommendations from London, was about to subscribe 30,000*l.* to a new invention, "at least of commercial value," but chanced to call at the Laboratory of the Charlottenburg Technical School. The three-colour process was explained to him, and he immediately wrote to London for specimens of the new (?) process. They were duly sent, and the merchant wrote to Dr. Vogel: "I can only say that the pictures you showed me are much finer and better than those received to-day from England." Dr. Vogel admires the caution of the man who fortunately withheld his 30,000*l.*

THE BICHROMATED GUM PROCESS.

HOWEVER extravagantly photographic "artists" may rage, and the supporters of the *Salon* imagine a vain thing, much will be forgiven them for bringing to general notice the great capabilities of the bichromated gum process of direct pigment printing. Though that process has long been known—it has been in use, it is said, at the Vienna Military Institute for over forty years—it was well-nigh forgotten, and would probably have been as dead as Julius Cæsar in another lustrum had not Mr. Maskell redirected general attention to it by his exhibits at the Salon of 1893. Thereafter, one of the first to apply himself to a systematic study of the subject was M. Rouillé-Ladevèze, who, on March 14, 1894, read before the Photographic Club of Paris a memorandum giving full details of the process. But the monograph, excellent though it was, would not have availed much if it had not been supported by visible proofs of the charming pictures obtainable by a close adherence to the instructions therein given. These, however, were so far superior to anything till then seen that many of Rouillé-Ladevèze's compatriots were induced to follow him, and they were soon followed by those of other lands who longed for liberty of artistic expression unfettered by material restrictions, until, within a few months from the publication of the memorandum, the Exhibitions of London, Paris, Brussels, and Vienna showed pictures produced by the bichromated gum process that as much charmed artists as they put profane scoffers to utter confusion. Since then, studied and practised by zealous seekers after the beautiful, the process has made steady progress; and, if to-day it has not quite attained perfection, or if there still remain things unknown, the matchless results already obtained clearly indicate it as the printing process of the future. Foremost among those who have steadfastly laboured for its perfection may be placed three members of the Vienna Camera Club, Messrs. Watzek, Henneberg, and H. Kuhn. These gentlemen have verified, corrected, and completed the observations of Rouillé-Ladevèze, and have published the result of their investigations in the *Wiener Photographische Blatter* (Nos. 4, 7, and 10 of 1896). As their articles should save novices many fruitless trials and discouraging failures, the following *précis* will, no doubt, prove useful.

Paper.—Any close-grained, well-sized paper will answer, though Messrs. Henneberg and Kuhn recommend specially the drawing and water-colour papers prepared by Schleicher and Schull, and the "Montgolfier" paper prescribed by Mr. Demachy. This latter can be had either in white or in cream, and other warm tints, and, when the grain is close, gives most brilliant prints. More open-grained papers, Mr. Watzek says, retain the colour better, and give half-tones more easily; but Messrs. Henneberg and Kuhn assert that the rough English makes do not give pure white.

Sizing.—Whatever paper be employed, it will be advisable to size it. For this purpose starch or flour may be used, two to four parts of starch being taken to a hundred parts of water, according as the surface of the paper is more or less rough. Dr. Just, of Vienna, sells nine varieties of paper ready-sized for coating.

Colours.—The quality of the colours used is of the first importance, and our authors are particular in recommending certain manufacturers. Watzek suggests the use of pigments manufactured by either Winsor & Newton, of London; Schmincke, of Düsseldorf; or Paillard, of Paris; but finely ground pigments of other makers will, no doubt, serve equally well. All colours are not suitable. Blacks, whether animal, ivory, or lamp-black, give the best results; blues, particularly Prussian blue, ultramarine, or indigo, are nearly as good; but browns are exceedingly difficult to work. Besides the blacks and blues named, burnt sienna and English red may be used; other colours had best be left alone.

Character of Negatives.—For the best results, transparent and soft, but by no means weak, negatives should be used. The style of negatives that give good enlargements is what is required. It is, possible, however, by varying the proportion of gum and pigment, to obtain very successful prints from negatives of any character. Dr. Henneberg and Kuhn state that, by using burnt sienna, they have succeeded in securing excellent pictures from negatives that were too harsh for ordinary printing-out paper; and they lay down as a general principle that, the more gum used, the more pronounced the gradation of tones, and that an increase in the quantity of colour tends to softness.

Gum.—The gum to be used is the ordinary gum arabic sold by stationers for office use. Mr. Watzek prefers to use a ten per cent. solution, with the addition of a few drops of phenic acid as a preservative; but Messrs. Henneberg and Kuhn recommend a solution containing equal parts by weight of gum and water, without any preservative. Their experiments having shown that the longer the gum solution is kept the more sensitive it becomes, they prefer to let the solution stand till it becomes mouldy, and to then filter it for use. In this state it will keep for a long time without deterioration.

Coating the Paper.—The sensitive coating is prepared by pouring into a graduated glass measure, in equal quantities, first the gum solution, then the pigment, and lastly a ten per cent. solution of bichromate of potash, and mixing them *thoroughly*. It is advisable at this stage to test the quality of the mixture by coating thinly with it a small strip of waste paper. After drying, the surface should show the dull lustre of the crude gum. The brilliancy or otherwise of the coating is, in fact, of the highest importance; for, if the layer is too brilliant, it indicates that there is too much gum, which will disappear with its contained colour in the subsequent operations, and, if the coating is very dull, the shadows of the picture will be choked. Between these two extremes a variety of changes can be rung, to suit the subjects to be depicted. As on the quantity of gum depends the grain of the image, a sufficiently large proportion should be used for landscape to secure brilliancy, and a correspondingly small quantity should be employed for portraits. In this matter each photographer must work out his own salvation. The right proportions of the constituents having been settled, the paper selected for printing is coated, in yellow light, with a thin layer of the mixture. For the purpose use a large and broad brush fully charged with the sensitive gum solution, but be careful to avoid all brush marks or other unevenness, and to lay on the coating so thinly as to permit of the underlying paper being seen. When the ground has been laid, go over it with a badger's-hair softener or broad camel's-hair brush, so as to ensure a perfectly even coating, for on this depends success or failure. The coating having been satisfactorily distributed, the paper is to be dried quickly over a stove. It is essential that the paper be absolutely dry, otherwise the colour will dissolve in washing; but care should be taken to avoid scorching, as that would produce indelible marks.

Printing.—Paper prepared as directed may be kept for a few days, but it is always advisable to use it as fresh as possible, preferably immediately after sensitising. At this stage the technical skill of the worker will have most occasion for display, since good results are obtainable only from correct exposure, and the length of exposure depends on the quantity of gum in the coating—more gum, more printing. As the light impression is not visible till after development, the depth of printing has to be judged by a photometer. Any one of the photometers commonly used for carbon work will do, though our authors employ Fernande's, and find that the blue-black tints require from 3° to 4° on that instrument (*i.e.*, about two minutes in sunlight), black colours from 4° to 6°, and brownish yellows about 10°. Mr. Watzek says, however, that the exposure, on a fine winter day and with a soft negative, should range from a quarter to half an hour, the difference depending on the colour of the prints and the quantity of the bichromated gum in the film.

Development.—After printing, the paper is immersed in a dish of pure cold water, which is changed every few minutes, until it ceases to show any trace of yellow caused by the bichromate in the coating. Once the bichromate has been eliminated, the further operations can be comfortably carried out in daylight. If, now, the exposure has been correct, the outlines of the image will soon show themselves at the points of greatest contrast, and the highest lights will appear in the cold water. Rock the tray for about five minutes, and then add a small quantity of tepid water of about 70° F., increasing the temperature from time to time till the image commences to appear. Now carefully lift the print on to a sheet of glass, cautiously avoiding contact with the surface, and, holding it over the basin, keep pouring water on the picture. If the exposure has been too short, development will soon be completed, but the image will be weak. Over-exposure, on the other hand, will cause the image to hold back, and in that case recourse may be had to the sawdust soup recommended by Artigue to bring out details. Finally, replace the print under water, and, by means of a soft and fine brush, remove the parts that offer the greatest resistance, clearing up the portions that appear too dark and eliminating useless detail. Proceed, however, with the utmost caution so as to avoid marks, and do not allow the passion for "artistic" results to annihilate photographic excellence.

After Operations.—Development having been completed, the print is immersed in a ten per cent. alum solution, to remove the last traces of bichromate, and, after thorough washing in cold water, is dried. It should then be varnished with any good crystal varnish, as that gives depth and transparency to the colours, particularly to those, like umber and burnt sienna, that have a tendency to appear too deep.

Final Remarks.—Printing in clouds from a second negative is not possible unless, after development, the sky portion is resensitised, printed on, and redeveloped. By this second sensitising, however, effects in two colours may be produced. Certain authors recommend the use of soda and acids in development, but Kuhn is distinctly opposed to their use, as they diminish the intensity of the shadows. GEO. EWING.

THE USE OF THE SUBSTRATUM.

MY reference at the end of an article a fortnight ago, to the use of a substratum or preliminary coating as a safeguard against dirty glass, has brought me several letters in which the writers point out that I am wrong, and that, so far from the substratum proving a cure for dirty plates, it is really a prolific source of that evil.

But, while I am quite ready to agree that my correspondents may be right in the latter part of the above assertion, it by no means follows that I am wrong, and, in fact, I maintain that a preliminary coating of india-rubber, albumen, or gelatine, is undoubtedly a cure for dirty glass, and a safeguard against stains and markings from that cause, but that it introduces difficulties of its own, inasmuch as it forms a more or less porous surface that, by harbouring the chemicals, is more favourable to the production of stains than one of clean glass. My correspondents should, therefore, blame their own carelessness in placing too great reliance on the substratum, rather than the substratum itself for the result of which they complain.

For all ordinary work, I myself prefer to work without any such coating, for the reason that, unless very severe intensification is required, as for process negatives, the collodion film is easily kept on the glass by means of talc, and a surface of clean glass, is, I think, the best possible one on which to produce a clean image. But, especially when using old glass, it is not by any means a sure thing that, with every precaution, the glass is really chemically clean, and the substratum comes in as a protection against unavoidable accidents in that direction; but, in using it, it must always be borne in mind that a fresh danger is introduced, which, however, is avoidable if kept in view and the needful precautions observed. In other words, if the operator will remember that beneath his sensitive film is one of an absorbent character into which the various solutions soak with more or less readiness, and from which a certain amount of washing is necessary to dislodge them, he will probably steer clear of any trouble; but, if, on the other hand, he adopts a preliminary coating, not only as a substitute for cleaning glass, but as providing an absolutely stainless surface, he will very soon find himself all wrong.

In practice, and with a fair amount of washing, no trouble whatever will be experienced in the use of either albumen or gelatine under ordinary conditions, but I very much question whether either—but especially gelatine—will bear very severe or protracted silver intensification without showing discolouration. I do not set this down to any direct chemical action upon the gelatine or albumen, as has been done in connexion with silver intensification of gelatine films, but simply to the practical impossibility of thoroughly freeing the thin absorbent layer from the soluble matter it contains. In the days of wet collodion and indeed, still, an albumen substratum was, and is, used in order to ensure a clean working surface, and this practice gave rise to a good deal of controversy as to the effect the albumen had in securing this end, but also upon the working of the bath. Perhaps, if the truth were known, the variations in this direction were directly due to corresponding variations in the care observed by different operators.

However, with dry-collodion plates, the application of the substratum is often necessary from other reasons, and may be regarded in that connexion as one of the essential points of the process. The question then arises, which is the best substratum to use? There were three in common use amongst old dry-plate workers, each of which had its supporters. Indiarubber and albumen were the most commonly used, while gelatine was preferred by some; amongst others, I think, by Major Russell.

Indiarubber, I think, may be dismissed at once, as being the least efficient and the most dangerous, since, if it be used at all, it must be in such an attenuated layer that it has very little action; if the quantity be increased, the indiarubber, being soluble in ether, combines more or less with the collodion or emulsion, which is thus "waterproofed," and rendered more or less impervious to the developer. Even when used in thicker solution for tipping the edges of plates, this effect is often seen in

patches or streaks of insensitiveness at or near the corners and edges, where the rubber has dissolved and run into the film.

Albumen was, undoubtedly, the favourite with old collodion workers, and, I may say, still remains so, or would, but for one weak point it presents. When properly prepared, the solution flows as easily over the glass as collodion, dries smoothly and evenly, and presents a firm grip to the collodion film; but, unfortunately, with modern development it is liable to loosen its hold on the film owing to the solvent action of the alkali. This defect was altogether absent in the days of physical development, and was, even with alkaline development, less noticeable in dry processes in which the bath was employed, because the substratum was coagulated in the sensitising process, and so became less liable to the solvent action complained of; but, when emulsions are used, there is no such coagulation, and the result is that too frequently the albumen substratum proves worse than useless, since it helps the film to detach itself from the glass in blisters and patches, each of which forms a receptacle, between film and glass, in which the spent developer collects, and from which it is exceedingly difficult to remove it.

For this reason, gelatine would seem to be in every way preferable; but, though I have over and over again taken to it, instead of albumen, I have as frequently gone back again. The great objection to gelatine is that it must be used warm, since, even if as thin as one grain to the ounce, it is too viscous to flow properly at ordinary temperatures, and even when warm it is very difficult to get evenly over the glass without some mechanical means of spreading it, and this, of course, entails a great waste of time. When the film is obtained, however, it is perfect as a means of securing the adhesion of the film to the glass; but it has the disadvantage that it absorbs and holds far more of the developing solution than albumen does. This, however, can be met by careful washing, so that it need not be set down as a fault.

Some little time ago an idea occurred to me, by which I saw a way to secure the combined advantages of both albumen and gelatine without their defects, and, on putting it to practice, I think I have succeeded perfectly. The method consists in converting the gelatine into meta-gelatine and using it in conjunction with albumen. A thinner film of gelatine is then obtained, and the albumen gives it smoothness and fluent properties, while the gelatine prevents the latter softening under the alkaline developer.

Take thirty grains of gelatine and from thirty to sixty minims of acetic acid, and boil for some minutes, until the gelatine becomes permanently liquid. Allow it to cool, make up to forty ounces in bulk, and then stir in carefully and slowly the white of one egg, after which the solution is filtered and is ready for use. This will be found to hold the film firmly, and to permit any amount of washing without loosening, and, so far as it is possible to use a substratum without getting stained films, I think this meets all requirements.

W. B. Bolton.

THE BICHROMATED GUM PROCESS.

Herr Hugo Henneberg, whose pictures have attracted no small amount of attention at the recent Salon exhibitions, contributes an articles to the current number of the *Wiener Photographische Blätter* which contains the result of his experiences in the working of this process.

The conclusion to which Herr Henneberg has come is that, for the successful working of the process, the most important factor is the amount of gum which is laid on the paper and he says that hitherto either too much or too little gum has been used, the coating has been too thin, it was printed too much and the water used was too hot. He has found that prints which have only been exposed for a short time and developed in cool water, when a plentiful quantity of gum has been used, are much more "piquant" and fresh than those with which a little gum was used and over-printing and hot water were employed.

His advice as regards the materials is, of course, based on Continental firms, and it might be difficult therefore to obtain some of the materials which he suggests.

The Paper.

Well-sized paper is the best that can be used, and of the smoother papers, those of Causon & Montgolfier, the drawing paper of Schleicher & Schüll; for coarser grained papers, No. 751 of the latter firm and the water-colour paper of Johannot & Co., of Ammonay are the best; the drawing papers as used for platinotype printing, especially Whatman's paper, are totally unsuitable.

The Chemicals.

The solution of gum arabic should be forty per cent., its quality is not of the greatest importance; the solution of potassium bichromate should be absolutely saturated. When this process was first used, considerable importance was laid on the quality of the colouring matters, but Herr Henneberg finds that this has little effect; the water, paste, and tempera colours, powders, powdered drawing chalk, lamp-black and many others may be used with equally good results* Herr Kühn recommends also fatty colours, soft Conté crayons, pastel colours, and especially drawing chalks. As a rule, a colour is better and gives softer prints the richer it is and the finer the powder. By comparative experiments, Henneberg states that the colours as generally used are absolutely unchanged in shade by the addition of the bichromate.

It is difficult to make exact statements as to the proportion of the three ingredients. For a sheet 50 × 60 cm. Henneberg uses 1½ – 2 g. of colour, 6 – 8 c. c. of gum solution, and this mixture is diluted according to the thickness of the coating with from 15 to 25 c. c. of solution of potassium bichromate. One tip, which may help as to the suitability of a paper and a proper quantity of gum, is the following: a piece of the dried and unexposed paper must part with the whole of its pigment, when laid in cold water for half an hour. If this is not the case, too little gum has been used. If a faint tinge of colour remains on the white unexposed edges or rebates of the prints, the paper is not suitable; it is too fibrous.

Spreading the Colour.

Of considerable importance and, next to the development, the most important factor is the correct spreading of the colour, not so much as regards its regularity, but in respect to the tonality of the surface and the white paper. Obviously, if one considers as to what the final picture is to be as with the other processes, a correct coating is all-important, whilst with other processes the depth of the picture in the deepest shadows is dependent on the length of exposure, and therefore the greater or less decomposition, that is to say, the separation of more or less metal (silver or platinum); in the bichromated gum process the deepest shadows are determined beforehand. The whole character and tonality of a picture, whether one wants a vigorous, plucky picture with deep shadows, or one with soft gradations, depends, in this case, not on the character of the negative or the exposure, but solely on the original intensity of the colour on the paper. It is, therefore, says Henneberg, one of the requirements of a bichromated gum picture that exactly so much colour, and no more, should be spread on the paper as should be present in the deepest shadows of the picture, and therefore the amount of raw pigment spread on the paper must be proportioned in every case to the effect which it is desired to attain. Thus, if it is desired to print a vigorous, plucky landscape, such as a country scene, and a delicate head study, the same sheet of paper cannot be used, which is totally different to platinotype paper. In the deepest shadows, the whole of the gum must become insoluble, and in development no colour should be dissolved away; if, however, excessive colour is present on the paper and in the deepest shadows, the development must be prolonged in order to remove the excessive colouring matter in the shadows, so that the high lights and half-tones may be washed away.

The peculiar peeling of the colour in development, which has frequently been complained of, is, according to Henneberg, due to the thickness of the film rather than the quality of the colouring matter. It appears generally when too thick films are used, or with under-exposure; that this flaking or peeling is more noticeable with brown films is due to the fact that these require the longest time to print. The thinner the film is, the more gum it will stand.

Printing.

From what has been said above, it will be seen that Herr Henneberg lays less stress upon the printing than is usual in other processes, and he considers that the method of development is more important, but considers that it is advisable to use an actinometer, especially when it is not possible to see the image. As a sign of correct printing, Henneberg considers that the high lights should be distinctly visible, without any adventitious aid, after half an hour's soaking in cold water; and he says that no aid to development should be used till all the chromium salts are washed out. If the high lights are visible only after the use of hot water or some other developing agent, the print was over-exposed. Under-exposure is recognised by the film dissolving too readily.

As a rule, thin and soft negatives are to be preferred, but this does

* It must be distinctly understood that some of the colours which can be obtained in England at least are quite unsuitable for this work, as they will not dry, and undergo a distinct change of colour after insolation and development, which is distinctly opposed to Herr Henneberg's statements below. It is always advisable, when working this process, to make a small test batch of paper and prints from it before making up a large quantity.—A. D. P.

not mean that good effects cannot be obtained sometimes from hard negatives; but it is important that the shadows of the negatives should be quite clear, as good results are never to be obtained from flat and foggy negatives.

DEVELOPMENT.

The development Henneberg states to be the whole secret of the process, as by judicious use of various agents any effect desired can be obtained. He uses a common scent-spray diffuser, which is placed in an ordinary bottle, which is held in the left hand, whilst the right hand is used to operate the indiarubber bellows, which should be fitted with two indiarubber balls, so as to give a continuous stream of liquid. By bringing this into play at the correct moment, increasing or reducing the distance between the spray diffuser and the print, and the use of cold, lukewarm, or hot water, any effect can be obtained, and it is particularly suitable to clear up dark parts of the picture.

COMBINATION PRINTING.

Henneberg's prints by this process in the last Salon were noticeable for the clouds, which he had obviously printed in, and he explains how this was done. He states that he discovered that, after one of these bichromated-gum prints had been developed and dried, it adhered very firmly to its support, and that therefore it could be again treated with hot water, brush, or spray, without suffering change. It is thus possible to develop a print and obtain a perfectly white sky, and to dry the same, and then coat it afresh with the pigmented gum and expose afresh under a cloud negative, and then to develop this till the desired result is obtained.

A. D. PRETZL.

A CRITICISM OF PHOTOGRAPHY AND BEAUTY.

"Beauty is truth, truth beauty—that is all
Ye know on earth, and all ye need to know."—KEATS.

IN his article on *Photographing Beauty*, in the JOURNALS of February 19 and 26, Mr. Richard Penlake raises an interesting question for all those who hope for much from photographic art, and dismisses it in a manner not altogether satisfactory to the photographer. The question is the limitations of the camera as a means of artistic expression. How far can the artist depict his ideas when using the camera instead of the brush? Apparently, Mr. Penlake has faith in the possibilities of the camera, yet the dicta he lays down imply that photography is incapable of anything beyond the reproduction of the materialistic aspect of things, thus for ever abolishing its art claims.

My aim in writing these lines is to point out that his utterances on the picturing of beauty, though true in a limited sense, do not go far enough, and lead to the error of not only misrepresenting the work and methods of artists, but also to an under-estimation of the powers of the photographer in contest with the painter. I therefore write with no spirit of hostility, merely putting forward another view of the subject, with the belief that artistic photography is still in the balance, and that we are unable to say, definitely, what is its legitimate sphere. If my position is wrong, it will only throw into greater prominence the true one; if right, I trust it will help to give definiteness to the present somewhat blind aspirations of the younger school of photographers.

Our author, with the boldness and light-heartedness of youth, starts his exposition with a statement of what he conceives as beauty. He says: "There are, roughly speaking, two distinct kinds of beauty—the 'ideal' and the 'real;' the former, artists of the brush deal with; while the 'real' falls to the lot of a photographer." I shall not go the length of giving another definition of beauty, but I will say, most emphatically, that, whatever may be its essence, it cannot possibly exist, even as a rough division, under the dual form of "ideal beauty" and "real beauty." As Keats expresses it, "Beauty is truth," and like truth, inconceivable as plurality; every individual may have a different notion of beauty, as of truth, but, with growing insight into beauty, it tends ever to unity. By dividing into "ideal" and "real," one must be false; evidently this is the "ideal," inasmuch as it is admitted to be outside and above reality.

To regard beauty as "ideal" and "real" is exactly the tactics of the opponents of the art claims of photography. They base their contention that photography is not art, and never can be, on the grounds that the painter can express abstract ideas, *i.e.*, redness without red paint, whereas the photographer cannot; they, however, forget to inform us in which gallery these paintings of abstract ideas are hung. So, too, Mr. Penlake does not mention the names of those "leading painters" who picture imaginary beauty. The painters, if they are artists, would repudiate the assertion, reflecting as it does upon their skill and their art. He certainly mentions recent work, though there exists no reason to suppose that these "angels ready-made for heaven" will outlive the passions of the hour that produced them; the test of beauty, in the words of the poet of beauty, is that it shall be "a joy for ever."

Supposing a painter can picture an "ideal" beauty from imagination, it follows that nature is bettered, and models a superfluity; yet, in spite of this, artists insist upon working from real things, clearly indicating that, in common with the photographer, they are compelled to build their impressions, not on the "ideal," but the reality. Undoubtedly, the artist previous to painting forms in his mind an "ideal," or idea of the subject; to this he works, correcting it by reference to nature, so giving the "idea" material form. But this "idea" is simply the scientific hypothesis, being a condition of all creative thought, from discovering the law of gravitation, designing a table, to painting a Madonna; likewise, the photographer can form an "ideal," and strive to reach it with the means at his disposal. A false ideal is never attained, which explains why so many painters fail to reach *their* ideal. A true ideal can be expressed, but always falls below nature as revealed to the mental vision of the artist. For the master, the canvas ever lags behind nature; for those deficient in the sense of beauty, the canvas surpasses nature; so we have the two sayings: "Art copies nature," and "Nature copies art." Manifestly, there is no difference between the artistic and photographic methods of delineation, the only distinction being that, whilst the artist errs from the beautiful through mistaking his ideals for the reality, the photographer suffers from the materialistic side of nature, clouding the ideal he has conceived. An ideal beauty has never been pursued by the great artists, but the truth; truth in art, meaning not naturalism or idealism, but the fullest and noblest beauty as revealed in nature and man.

An "ideal" head must be neurotic, and the artists, in all arts, are remarkable for their sanity, appearing on a superficial examination as commonplace, entirely lacking that quality of attractiveness so conspicuous in fugitive paintings, novels, and plays. A masterpiece only grows upon us with our own artistic growth. Inability to depict "ideal" heads is probably "for" rather than "against" photography. The artist can crow over the photographer because the brush gives him the power of addition and suppression; he can "idealise," says Mr. Penlake. To me, the painter who idealises stands confessed of his own weakness. Beauty has not necessarily anything to do with form, for it may exist on the most common faces, simply as expression, and artists are repeatedly trying to lift ordinary subjects to a higher level by depicting them under a mood, as Turner did. The same with selection; to take an eyebrow here, a toe there, a "trilby" elsewhere, is not likely to give us beauty, otherwise would all artists be better occupied with the rule and compasses. This conception of beauty as all-round perfection misses its true inwardness, which is actuality; for example, take the accepted head of Buddha, a face of perfect form, yet lacking every trace of personality; for its object, an "ideal" head, impressing the beholder with that feeling of vacuity, nothingness, and the sensationless Nirvana, beloved of Orientals, its very unreality putting it outside of art. Compare with Buddha the head of the Doge by Bellini; here there is neither beauty of form nor expression, but it has so unmistakably the stamp of actuality, showing us the noble and base qualities of the man, that we recognise it as great art, and it appeals to us to-day as it appealed to men hundreds of years ago.

Ideal beauty is not superior to real beauty, for the most beautiful imaginary head, in contrast with life, looks dull and insipid. I doubt, too, if a head can be drawn for which there is no duplicate in nature. Take the case of Aubrey Beardsley; his women are certainly "ideal" enough, yet, since his drawings have become common, I fancy all observers must have seen at least one woman who might have stepped from his canvas; the same with the Burne-Jones maidens, who can be found in abundance among the Socialist class. It is not that beauty does not exist, but it is the want of artists who know beauty when seen, and can drag it forth.

Ideal beauty, then, is only real beauty as seen and painted by the gifted individual; its delineation is as possible to the photographer as to the painter; the man who can see beauty where it has never been seen before will find some means of depicting it, either by camera or brush. Men who crow over the photographer because they can idealise, and he cannot, are only crowing upon a heap of dead ideals, which lived, had their little day, and perished, while the real beauties of art remain, left by artists who painted only the eternal realities.

"There ain't no such thing as beauty nowadays" is a sentiment common enough, mainly because the "cant of idealism" has put beauty in the light of something super-sensual, and not as existing on earth among ordinary men and women. In Greek or Italian periods this sentiment was unknown, artists being workmen who lived for art, and pursued it not as a "glorious pastime," but as one of the higher faculties possessed and enjoyed by the meanest citizen. It was a people's art, and stands to-day, men still prating of "ideal Greek heads," and "Divine Madonnas," regardless of the fact that the masters have been incessantly repeating and insisting that the "ideal heads" are the pictures of real men and actual women, who walked and lived in the flesh.

It is possible—and I believe the process is beginning—that photography will bring to the minds of men that beauty and art have this close relation to every-day life. At present the relation is obscured, because art is dragged at the chariot wheels of the rich, only a few so-called visionaries, like the late William Morris, teaching the possibility of decorated, picturesque dustmen.

Photography has all the requisites for accomplishing such a mission, if only its followers do not despair of its powers, as Mr. Penlake seems to do, and ever keep before them a high purpose. Inspired by noble aims

should see growing up a body of young workers who would lift otography from the commercial groove, making it one of the first of a nuine worker's art craft, followed by working artists, for the pleasure d benefit of the whole community. JOHN A. RANDALL.

PHOTOGRAPHS IN THE STUDY OF ASTRONOMY.

IE ways of illustration in the study of astronomy are many and varied. odern text-books of recognised authority are written by able scholars the science, and useful illustration in them is abundant. A student ordinary ability will generally find little difficulty in comprehending e meaning of best authors who have prepared books on descriptive tronomy.

But it is more particularly the purpose of this brief article, says Mr. W. '. Payne in *Popular Astronomy*, to call attention to the special advan-ges of good photographs or lantern slides made from photographs in ıe study of many celestial objects. Most of our readers already know ıat the art of celestial photography is of recent origin. Even as late 1889 very few astronomers, if any, knew certainly how to make proper xposures of the sensitive plate, so as to obtain useful results during the tal solar eclipse of that year. Probably seven-eighths of the photo-raphic work done by expeditions to California to photograph that eclipse ere useless on that account. It will be remembered that, at that time, ıe very sensitive plates necessary to such work, as well as some other, ad come into the hands of the astronomer only a little while before, nd he lacked the experience in their use which he has since well and ully learned.

For the last eight years celestial photography, as a means of original ork in astronomy, has been pursued vigorously, widely, and very suc-essfully. Its progress has materially affected every important branch f astronomy, both new and old. Chiefly on account of this fact, it has een necessary to revise the best text-books of astronomy not yet en years old, in order to keep pace with the progress of the science in ssential things. We have ourselves been impressed very strongly with he marvellously rapid growth of knowledge lately, from the fact that ve have had at hand an excellent sixteen-inch telescope, whose visual ower is equal probably to the best of its size anywhere, judging from ome very satisfactory tests in double-star work, also from the fact that ve have had an eight-inch photographic telescope and a six-inch photo-raphic camera, which have given us like favourable advantages for the tudy of celestial photography. With this fine modern equipment, it as been easy to follow essentially all important recent astronomical ork done anywhere in the world, and to reproduce some of it by our wn instruments at Goodsell Observatory, to give us impressions of an riginal kind for uses in our post-graduate courses in astronomy and mathematics. With such facilities, it has been comparatively easy for us to get many good photographs of celestial objects now under special bservation and study at other observatories, and to make from them first-rate lantern slides for the use of teachers and lecturers. Those who have used such means of illustration for instruction in astronomy do not need o be told of the superior advantages of such helps in conveying correct and lasting impressions concerning some features of interest that cannot, at present, be gained in any other way.

Another advantage of good photographs or lantern slides is found in the fact that they often show more detail in some objects under study than is otherwise poasible, thereby leading to discovery and increase of knowledge. This is so because the highly sensitive photographic plate will record impressions plainly from very faint light sources if the exposure be made sufficiently long to allow the feeble light rays to work on the gelatine film. The natural eye will work to the limit of its power of vision in a very few minutes at most, while the sensitive film will record more and more as time goes on under favourable circumstances. This is why the photographic plate will record more, in some ways, than the best eye can see in the best telescope yet made. It is easy to illustrate this fact by referring to discoveries recently made by the aid of celestial photography. The Pleiades cluster of stars is a fair example. Only a few years ago good observers were in dispute whether or not the Merope star of the cluster had about it a nebulous veiling something like the tail of a comet. Some claimed to see it by the aid of a two-inch telescope, others could not see it all with much larger instruments, and still others firmly held there was no such nebula belonging to the star. This was true in 1882, after E. Barnard had observed the nebula, made a drawing of it with brief description which was published in the *Sidereal Messenger*, vol. i.; p. 34. Later, when photographs of the Pleiades were made by a score or more competent observers, the Merope nebula was one of the easy features to trace on the negatives, and its general outline was in accord with the drawing made by Mr. Barnard. Not only was this point of dispute settled by the photographic plate, but much more of very great interest was revealed by later long-exposure photographs pertaining to the whole field to this same cluster which was not previously known at all. We have reference to nebulous masses clinging to other stars of the group as well as to Merope, whose mottled and streaked formations are so plain, that any one must say that they belong to the star group and are not in space beyond. This fact was seen to be significant in tending to settle an important matter, as to the order of distance in which some nebulæ stand in relation to bright or faint stars. Similarly startling things have been brought to light by the aid of photography in regard to many other celestial objects, such as star clusters, nebulæ, whole constellations, as Orion, parts of the Galaxy, the discovery of asteroids, variable star spectra, the cloud-like forms in dense star fields, and many others which we have not now space even to name.

In view of these facts, it seems to us that high schools and academies everywhere might be greatly aided in their work in the class room by a well-selected supply of mounted photographs and lantern slides for constant use in the reference library, accessible both to teachers and to students where their number and advancement are sufficient to warrant the small outlay of money necessary to obtain them. Colleges and some state normal schools already have such apparatus, and many institutions make free use of the stereopticon in this kind of illustration.

GIVING INTERMITTENT MOTION TO A STRIP OR FILM FOR TAKING OR EXHIBITING PHOTOGRAPHS: SHORT'S IMPROVEMENTS.

IN Mr. H. W. Short's invention the strip or film is provided with perforations near each edge of same. The strip or film is carried upon a spool or holder, and passes over a roller having projections or pins which correspond with the perforations near the edge of the strip or film. This roller is given an intermittent motion by being operated by a toothed wheel carried upon the spindle, which carries the drum over which the strip or film passes, said toothed wheel being operated by a helix so arranged upon a spindle that there is an interval between the time of contact of the two ends of the helix with the teeth upon the toothed wheel aforesaid. The strip or film is wound up, after exposure, upon a spool driven by a band or belt actuated by the toothed wheel, which is caused to rotate by the helix. Upon the spindle carrying and operating the helix a perforated diaphragm is carried, the perforations being so arranged that an exposure is obtained at the time when the film is stationary, owing to the difference or interval of time between the contacts of the ends of the helix. Suitable brakes are provided to regulate the motion of the spools. When it is desired to exhibit the pictures upon a strip or film, the same may be projected upon a screen by means of light, or viewed through a suitable opening or aperture in front of the rotating disc or diaphragm.

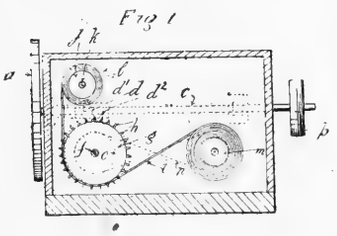
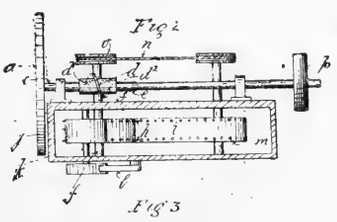


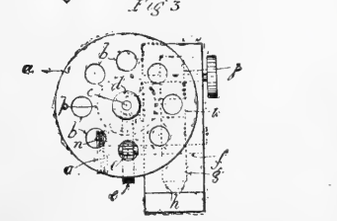
Fig. 1 is a side elevation.

Fig. 2 plan view of same.

Fig. 3 end elevation, showing rotating disc or diaphragm.



a is the rotating disc or diaphragm, having the aperture, *b*, in same. This disc, *a*, is carried upon a spindle, *c*, which carries the helix, *d*, which engages in the toothed wheel, *e*, secured to the spindle, *f*, to which is attached the drum, *g*, having points or projections, *h*, at each side of same, said points or projections engaging in apertures in a band or strip, *i*, upon which the photographs are taken. This band or strip is carried upon a spool, *j*, which rotates upon the bearing, *k*, and is controlled by the spring brake, *l*.



The band or strip is wound upon the spool, *m*, after exposure, said spool being rotated by the belt, *n*, which is driven by the pulley, *o*, attached to the spindle, *f*.

It will be seen that, owing to the helix, *d*, being so shaped as to leave an interval between the engagement and disengagement of the ends, d^1 and d^2, that the toothed wheel, *e*, will have an intermittent motion, that is, the film, band, or strap, will be stationary during the exposure through the aperture in the disc or diaphragm, *a*. Any convenient form of lens may be used before the diaphragm, *a*. The spindle, *c*, may be rotated by any convenient power, *p* being a pulley for transmitting the rotation to same.

The claim is: In apparatus of the class herein described, a spindle carrying a helix, so arranged that there is an interval between the engagement and disengagement of the ends of same with the teeth upon a wheel which operates the drum over which the band or strip passes, said spindle earrying a perforated disc or diaphragm, the band or strip being carried and unwound from a spool controlled by a spring brake, said band or strip having perforations at or about one or both sides of same, into which points or projections upon the drum over which it is passed, engage, and, being then wound upon a spool driven by a band which passes round pulley wheels upon the spindle carrying the toothed drum and the spindle carrying the winding drum.

Our Editorial Table.

Catalogues Received.

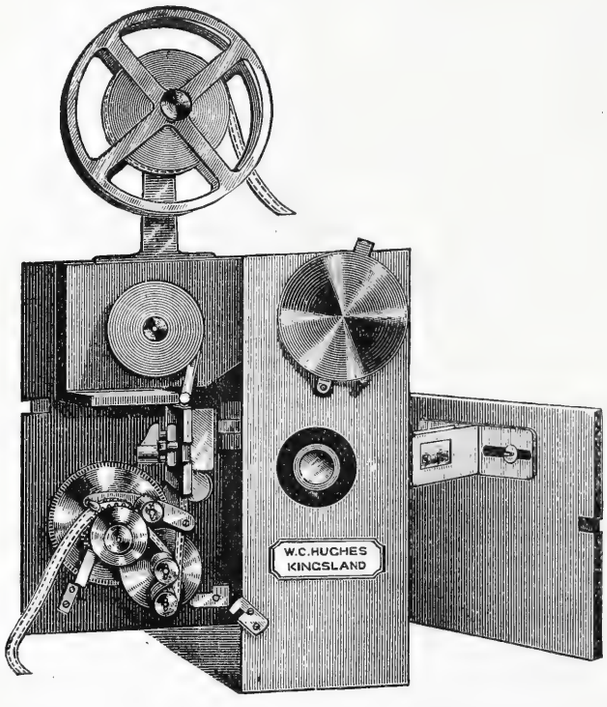
Harrington Brothers, Oliver's-yard, 53A, City-road, E.C.; wholesale price-list of chemicals. David Allan, supplementary list of photographic apparatus for 1897.

Hughes' Moto-photoscope.

W. C. Hughes, 82, Mortimer-road, Kingsland, N.

Among the many advantages claimed for Mr. Hughes's Moto-photoscope are several of a unique character. The instrument is very portable, the case measuring only 11 in. high, 7¾ wide, and 4¾ deep. There is no flicker, because there is no shutter. As no light is cut off, there is perfect illumination. The machine runs easily and smoothly, and the films are never damaged or torn.

The film winder is unique, as a film can be wound in less than half a minute; and there is also a compensating shutter, to allow for the



irregularities of the perforation, which are occasionally found in various films.

The wear and tear of the film is practically *nil*, because it is drawn down by the rotary projecting arms and not the sprocket wheel, and the pressure is only about 2 lbs. weight.

The entire mechanical parts are fitted to the door of the Moto-photoscope case, which can be easily opened to allow the operator to change his films, and, while this is proceeding, miniature pictures (specially made) can be exhibited. The effect of this prevents any break in the continuity of the entertainment.

Owing to the perfect balance of the rotary movement, there is no vibration. The machines are supplied to work Edison's Kinetoscope gauge.

McKellen's "Infallible" Hand Camera.

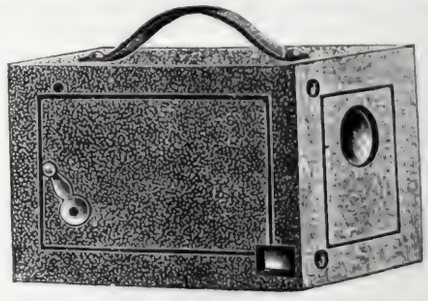
Thompson & Co., 4, Bull's-Head-yard, Manchester.

Mr. McKellen has submitted to us the latest pattern of his "Infallible" Hand Camera, which contains several useful improvements on the form originally introduced. We subjected the method of changing to a rigorous test, and found that it worked with so much certainty and smoothness as to well warrant the name "Infallible" being applied to the camera, an admission we all the more readily make when we bear in mind the many unfavourable experiences we have had with magazine hand cameras.

The leading features of the "Infallible" may be thus briefly set forth. It takes either plates or films in sheaths, at the bottom corners of which are projecting pins, which fit in grooved guide plates on each side of the camera. At the end of each groove is a circular hollow, having a revolving circular disc mounted on a shaft. As the sheaths are pressed forward by back springs, the pins of the first sheath bear against the discs, while the top of the sheath bears against a stop rail at the top of the camera. The discs have each a notch cut in them capable of receiving the sheath pins. The notches stand exactly opposite the grooves, and the pins of the front sheath, being pressed from behind by the springs, pass into the notches, where they remain till after the front plate is exposed.

Immediately after exposure, the key is turned steadily forward to the right as far as it will go. This movement causes the pins which are in the notches to be carried forwards and downwards until the sheath has left the stop rail, when the top portion of the plate in its sheath falls forward into the receiver.

The discs still continuing their circular motion, the notches and



pins arrive at the position when the pins are free to leave the notches; the whole sheath then deposits itself face downwards in the receiver.

As the sheath falls down, it is held in position by a gripper, which securely holds each last sheath as it falls, so that there is no movement of the sheaths in the body of the camera. An indicator, an automatic cut-off for preventing access of light to the plates when it is desired to open the front of the camera, and an extremely simple and ingenious lever shutter are also fitted to the camera, which in use probably gives the photographer less to do or think about than most cameras.

In short, the "Infallible" hand camera seems to have been designed to relieve the photographer of the likelihood of making a mistake in manipulation, and, if "the rest," in the shape of correct exposure and development, be attended to, the use of the "Infallible" cannot but be attended with pleasure and success.

Gevœrt's Albumen Emulsion Paper.

Otto Scholzig, 31, Binfield-road, Clapham, S.W.

There are several advantages claimed for this paper over ordinary emulsion or albumen papers; blistering, cracking, or curling are said to be not known with it. The film is as firm and hard as that of ordinary albumen paper, and it further resembles the latter in that it admits of the same freedom in handling. It is further claimed that, the film being coated direct on the finest raw paper, having no substratum of baryta, is less brittle than papers made on baryta-coated raw paper, and gives the pure high lights of albumen prints. The emulsion is made from fresh-egg albumen, and contains an infinitesimal amount of collodion, which imparts to the image its extreme fineness.

The results obtained on this albumen emulsion paper are exceedingly attractive to lovers of a good albumen print. Here are the instructions for working it:—Print a little deeper than the old albumen-paper prints, and, as the paper prints very much more rapidly than the old paper, there will be no loss of time in doing so. Wash the prints thoroughly in many changes. The subsequent treatment of the paper is exactly the same as albumen paper, with the exception of the composition of the toning bath.

Toning Bath.

Solution A.

Water	5 ounces.
Sulphocyanide of ammonium	25 grains.

Solution B.

Water	4 ounces.
Chloride of gold	3 grains.

Mix A and B; stir, and allow two hours' rest. If made up with distilled water, this bath keeps indefinitely, but a small quantity of new bath should be added each time of toning. In very warm weather it may tone too rapidly, and should be diluted with water.

After toning, wash and fix ten minutes in—

Hyposulphite of soda	1 ounce.
Water	10 ounces.

Wash well in many changes and mount like albumen prints.

Burnishing should be done with a burnisher with double rollers, the hotter the rollers the more brilliant the print will be.

News and Notes.

THE London Photographic Supply Company have removed to larger premises at 134, Borough, S.E.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 24, at eight o'clock, Mr. Thomas Bedding will read a paper.

MESSRS. THOMAS ILLINGWORTH & CO., of Willesden Junction, and 5, Soho-street, W., have secured the special agency for Seavey's backgrounds and accessories.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The Prize Camera for the current month has been awarded to Mr. C. S. Tyler of High Street, Earls Colne, Essex, for his negative, *The Bridge, Chalkney Mill*.

WE are informed that Mr. A. Montefiore Brice, who was announced to give a paper on *Polar Exploration*, illustrated by photographs, on Tuesday next, March 23, at the Royal Photographic Society, will be unable to do so. Another subject will be provided for the meeting.

THE Leytonstone Camera Club's Fifth Annual Dinner was held at the City Arms Restaurant, St. Mary Axe, E.C., on Wednesday, March 10. Dr. W. Pickett Turner presided, and was supported by a good number of members and friends. The toast of "The Club" was submitted by Mr. E. J. Wall, the Hon. Secretary, Mr. A. E. Bailey responding. Other toasts included "The Press and Visitors," and "The Chairman," acknowledged by Dr. Turner. Glees, songs, recitations, and sketches formed part of the entertainment provided, and a successful festivity terminated at a late hour.

THE Sixth Exhibition of Pictures by the leading photographic workers, and the Annual Exhibition of Photographs by members of the Louth and District Photographic Society, will be held at the Town Hall, Louth, on Thursday and Friday, March 25 and 26, 1897. On Thursday, the Private View and *Conversazione* will take place from 2.30 to 5 p.m. His Worship the Mayor (H. D. Simpson, Esq.) will open the Exhibition at 2 30 p.m. Mrs. S. Francis Clarke will have afternoon tea at 3.45. The Exhibition will be open to the public on Thursday from 6 to 10 p.m., and on Friday from 1 to 5, and from 6 to 9.30 free.

"M. LAFAYETTE, of New Bond-street, the Queen's photographer," says the *Daily Chronicle*, "has solved a problem which has agitated London householders almost since London became London. The fogs of the streets we can evade or avoid by many simple contrivances, the most simple being a railway journey to Brighton or elsewhere. But from our houses, our theatres, and, above all, from our photographic studios, it has hitherto been regarded as impossible to rid ourselves of the sticky, pea-soupy plague. M. Lafayette, however, has discovered a method by means of which we may purge our studios of London fog. With a system of flues and fans, he ingeniously pumps the fog out of the studio by one process, and pumps clear, ethereal air into it by another. For photographic purposes the system is absolutely successful."

THE North Middlesex Photographic Society's Annual Dinner was held at the Holborn Restaurant on Saturday, March 13. Mr. J. C. S. Mummery (the President) took the chair. There was an excellent attendance, among those present being Mr. H. Chapman Jones, Mr. G. Scamell, Mr. W. E. Debenham, Mr. R. Child Bayley, Mr. Bedding, Mr. Horsley Hinton, Mr. E. J. Wall, Mr. J. McIntosh, Mr. S. E. Wall, Mr. J. W. Marchant, Mr. H. Stuart, Mr. F. C. Tilney, &c. Responding to the toast of the Society, given by Mr. Hinton, the President briefly reviewed the past year's work, claiming for the Society that it did a great deal of good in a modest way. The distribution of the certificates gained in the recent Exhibition having been made by the President, the toasts of "The Officers," "The Press," and "The Visitors" were warmly given and honoured. Some excellent glees and songs were given during the evening.

To Plymouth Photographic Society's Second Annual Exhibition on the 10th and 11th inst. works were, by invitation, sent by Mr. J. H. Gear, F.R.P.S. (a fine Winchester Cathedral interior); Mr. E. Brightman, of Bristol (a contadino and a harbour sunset scene); Messrs. Howell, Esler, and Oakden, of the South London Photographic Society; Mr. C. F. Inston, Liverpool; Mr. Harold Baker, Birmingham; Mr. J. H. Coath, Liskeard; and Mrs. Catherine Weed Ward and Mr. J. Carpenter, London. F. Hollyer's series, after Burne-Jones, Watts, and D. G. Rosetti, and a sunset effect by J. B. Wellington, were also shown. The feature of the members' contribution was the large number of bromide enlargements, chiefly by Mr. E. H. Micklewood (President), Messrs. H. S. Hill and W. A. Duncan (Vice-Presidents), Mr. R. R. Monk (Hon. Secretary), Messrs. Dunstan, F. E. Bowden, W. H. Harris, and T. Algate. Mr. F. Johnson sent highly creditable platinotypes, and Mr. Drinkwater carbon work. Mr. Duncan had an example of work on Artigue paper, and several specimens of photographic ceramics; Captain Adair, toned bromide work; and Staff-Sergeant A. Bruce, A.M.S., several interesting radiographs; while Messrs. J. D. Turney and J. T. Trend contributed to an exhibition of great variety and some merit. The attendance both days was large, and on each evening there was an exhibition of members' lantern slides.

PHOTOGRAPHY AND MASSACRE.—The special correspondent of the *Daily Telegraph* at Canea says, under date Monday last:—"For weeks past conflicting rumours have been in circulation here respecting the massacre of Moslems by Christians in Sitia, whereby the number of victims was estimated now at 2000, now at 1500, and now at 800. To-day the Italian Consular Agent in Candia sends an account of the incident, somewhat sensational in its details, but comparatively reassuring in its estimate of the number of victims. It appears from this report, which has not yet been confirmed by other foreign representatives in Candia, that the Christians attacked several villages of the district of Sitia some five or six weeks ago. Thus the village of Dafnes was suddenly assailed one evening, and the Moslem men took refuge in two cafés, and the women and children in the mosque. The village possessed only fifteen rifles. The Christians fired through the windows upon the Moslems and then set fire to the mosque, employing petroleum and other inflammables. After nightfall the besieged threw themselves from the windows. The Christians spared neither women nor children, says this report, even striking those who lay motionless, in order to ascertain whether or not they were really dead. The writer declares that he saw nine wounded women and children, of whom one boy was over four years old. This child, although in a dying condition, was photographed for the purpose of illustrating this report, being held up in a standing position before the camera, so that a ghastly wound on the neck and blood on both feet should appear upon the photograph. The picture produces a terrible impression, and the exigencies of Consular reports cannot justify the cruelty involved in taking it."

WOLVERHAMPTON PHOTOGRAPHIC SOCIETY'S EXHIBITION.—A very pleasant gathering took place on March 9, the occasion being the Seventh Exhibition of work done by members of the Wolverhampton Photographic Society. Considerable interest was manifested in the event. There were over two hundred exhibits, and about forty lantern slides, although only a portion of the members sent in specimens. These were placed in seven classes, namely: 1, Landscapes and Seascapes; 2, Architecture, interior and exterior; 3, Hand-camera work; 4, Enlargements; 5, Animals, Flower Studies, and subjects not included in the above; 6, Pictures, not for competition; and, 7, Lantern Slides, (*a*) Landscape and Seascape, (*b*) Architecture (interior and exterior), (*c*) and all other subjects. The photographs were well mounted and framed, and suitably arranged round the room. The number of exhibits was about the same as last year, but there was an improvement in the quality of work done, that of the prize winners being of very high order. Messrs. A. J. Leeson and W. T. Greatbatch, of Birmingham, were the Judges, and the following were the awards:—Class 1, Mr. J. Gale, first certificate for the work *In the Heart of Kent*, and Mr. H. Holcroft second for *A Welsh Landscape;* Class 2, Mr. H. Holcroft first for *Old Berry Hall, Warwickshire*, and Mr. T. H. Cox second for *A Norwegian Porch;* Class 3, Mr. Cox for *A Seascape;* Class 4, Mr. Cox for *Interior of a Norwegian House;* Class 5, Mr. Holcroft for two two portraits. In Class 6, Mr. Ratcliffe exhibited views of Rhyl and neighbourhood, but not for competition. In the class for lantern slides, Mr. J. Gale was awarded first certificate for *A Kent Lane* and *Baddesley Hall, Warwickshire*, and Mr. R. W. Deans second for *Stromness Harbour*. There was a good attendance of the public, and during the evening the lantern slides sent in for competition were put through the lantern, Mr. Gale being the manipulator.

MANCHESTER PHOTOGRAPHIC SOCIETY.—The above Society held an Exhibition of the work of its members on the 11th and 12th inst., when the walls of the new rooms were hung with pictures. Those intended for competition had to be taken since the beginning of 1896, so was representative of one year's work. The work showed a striving after originality, several specimens of mounting and framing being distinctly original. In the competitive classes the Judges made the following awards: Landscapes over 5×4, *By Quiet Waters*, T. Morley Brook; Landscapes under 5×4, *Leicester Hospital*, C. H. Coote; Enlargements, *Sheep Study*, A. E. Casson; *Genre* picture, *A Forgotten Task*, T. M. Brook; Lantern Slides (set of six), Harry Wade. Landscapes was the most popular class, and brought out some really excellent work. Enlargements also came in for a good deal of attention, and the composition of *Sheep Study* is to be highly commended. Mr. F. Edwards in this class has two fine enlargements of Aberglasyn Pass and Gairlock, Ross, N.B. Mr. J. Young also has good work. Mr. H. Wade's contribution to this class was chiefly *genre*, although a study of *Mare and Foal* was pleasing. In the *genre* class Mr. Brook was in his element, his well-known style easily carrying him to the front. Lantern slides was again a good class, Mr. Harry Wade scoring with *A Helping Hand, Lilac Sunbonnet, Secrets, A Cheshire Pool*, and *Abandoned*. Mr. F. Edwards had an excellent set, chiefly architecture. Mr. A. E. Casson's were very varied, and included figures, flowers, and landscapes. Mr. W. G. Coote's were in his usual clean manner, his best being Guys Cliffe. Other good work in the Exhibition included *Evening*, a scene on Kinder, by Mr. W. Tomlinson; *Sunset, Port Erin*, by Mr. Wolfenden; and *Courtyard, Eagle, and Child Farm*, by Mr. W. G. Coote. The Judges in the competition were Messrs. George Hidderley (Stockport), G. E. Mellor (Manchester), and T. Widdop (Oldham). An hour in the evening was devoted to an exhibition of lantern slides, the first night being occupied by Mr. A. E. Casson, and was a *résumé* of the summer outings taken by the Society; the next evening Mr. James Wood occupied the sheet with his slides, followed by those set in for competition.

X RAYS: POSITIVE AND NEGATIVE, REVERSAL OF RIGHTS AND LEFTS, &C.—Mr. W. I. Chadwick writes to the *English Mechanic:* "It seems that a considerable amount of confusion exists in the minds of many, and this is partly accounted for by the misstatements of those who ought to know better. It should not be necessary to define the words positive and negative, as applied to either photographs or radiographs, further than to say that a positive is a representation of objects as they would be seen in nature, so far as light and shade, and a negative is the reverse of this, *toto cœlo*. The paper on which this communication will be printed is white, because the light falling upon it is reflected to the eye of the observer; the letterpress is black, because no light is reflected. Black is the absence of light. We see most things by reflected light; thus, a bone is said to be white, because we generally see bones by reflected light. A bone paper knife lies on my dark leather-covered writing table. A photograph of it would show a white bone on a black ground, because the photograph would be taken under the same conditions of lighting, *i.e.*, reflected light, and such a photograph would be a positive. I now hold the bone paper knife against the sky; it is no longer white. A photograph of it in this position would show it as nearly black on a white ground, and this notwithstanding that it is the reverse of the first photograph, is also a positive The first is made by reflected rays, the second is made by transmitted rays Now, X rays are not reflected rays; they excite vision (by a fluorescent screen and effect a photographic plate as transmitted rays. Objects opaque to the rays are made conspicuous on the fluorescent screen by the absence of rays, or in other words, they are black. The fluorescent screen enables us to see, and is positive; therefore a radiograph showing the bones black is positive,

and the reverse of this (white bones) is negative. The so-called grain or detail, seen in fully exposed radiographs of bone, is not surface markings, such as would be represented in ordinary photography by reflected light; it is simply owing to the vascular construction of the bone, or, in other words, by more or less transparency. We now pass to a much more important consideration, the reversal of the image as regards rights and lefts. In radiography, as previously observed, we have nothing whatever to do with reflected rays, it is only transmitted rays with which we have to deal. If the right hand be held palm outwards between the source of light and the observer, the thumb will point towards the left; turn the hand, that the rays strike the back of the hand, the thumb now points to the right. X rays and a fluorescent screen give the same result, and a radiograph also giving this result is not reversed. To make this clear, let the Crookes' tube (source of rays) represent the source of light, then the fluorescent screen or the photographic plate or film will represent the position of the observer; thus it will be perceived that, if the right hand be radiographed dorsal surface towards the tube, palmar surface towards the prepared plate, the resulting picture must show the thumb pointing to the right. A photographic plate or film used either for photography or for radiography is not the finished article, it is only a means to an end, and it is a negative, and, if the sensitive surface be towards the source of rays, a print from such a negative is positive, and no reversal of rights and lefts occurs. Bromide paper, used for radiographs direct will produce negatives always. When the sensitive surface is towards the source of rays, the rights and lefts are reversed; when the sensitive surface is turned away from the source of rays, the results are still negative, but the rights and lefts are not reversed. In actual practice, or for use in surgery, the radiographs may be either positive or negative, though, to prevent confusion, they are better to be always positive. In a radiograph of the hand, even the reversal of rights and lefts might not be of much consequence, but there are other portions of the body where this reversal might lead to very serious misunderstandings; and, indeed, cases have actually occurred (within my own personal knowledge) where, in consequence of the reversal, surgical operations have been misdirected."

Patent News.

THE following applications for Patents were made between March 3 and March 10, 1897 :—

FLASHLIGHT APPARATUS.—No. 5446. "A New and Improved Apparatus for Producing Flashlights for Photographic Exposures, Signalling and other purposes." F. G. ELEY.

SLIDE-REGISTERING APPARATUS.—No. 5632. "Optical Lantern Slide-registering Apparatus." A. Y. MORTON.

SCREEN PROJECTION.—No. 5800. "Improvements in the Projection on to a Screen of Photographs in Colours and Apparatus therefor." F. E. IVES.

CAMERAS.—No. 5995. "Improvements in Cameras." Communicated by E. B. Koopman. Complete specification. S. S. BROMHEAD.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
22	Camera Club	*A Run through Portugal and Madeira, to the Great River Amazon.* W. Wethered.
22	Croydon Camera Club	Final Trial of Lantern Slides for 24th.
22	Darwen	Lecture: *Treatment of Figures.*
22	North Middlesex	Members' Lantern Evening.
22	Richmond	*Ceramics.* E Morgan.
23	Birmingham Photo. Society	*The Choice of a Subject.* W. S. Horton.
23	Hackney	*Camera Manipulation.* A. Barker.
23	Halifax Camera Club	*Winter Printing Processes.* W. G. Thomson.
23	Isle of Thanet	*Intensification and Reduction.* John McIntosh.
23	Munster	*Lantern Slides.* A. Newsom and Ernest Scott.
23	Newcastle-on-Tyne	*Retouching.* W. Parry.
23	Royal Photographic Society	Technical Meeting.
23-25	West Surrey	Annual Exhibition of Members' Work.
24	Borough Polytechnic	*Enlarging.* John A. Hodges, F.R.P.S.
24	Croydon Camera Club	Special Benefit Lantern show.
24	Leeds Camera Club	*The Development of Printing-out Papers.* Leon Warnerke.
24	Leytonstone	*Photography with the Röntgen Rays.* The Prosser-Roberts Company.
24	Photographic Club	Paper by Mr. Thomas Bedding.
24	Southport	*Treatment of Figures.* Rev. F. C. Lambert, M.A.
25	Ashton-under-Lyne	Annual Meeting.
25	Aston	Rambles in Derbyshire.
25	Camera Club	*From Mont Blanc to the Matterhorn.* Lamond Howie.
25	Ireland	Demonstration in Carbon Printing. Alfred Werner.
25	London and Provincial	Open Night.
25	Oldham	*Two Summer Holidays.* Tom Heywood.
25	Polytechnic	*Bromide Enlarging.* F. Parker.
25	Woolwich Photo. Society	*Isochromatic Photography.* F. W. Edwards.
26	Bromley	*Orthochromatic Photography.* S. B. Webber.
26	Croydon Microscopical	*Exposure and Development.* J. H. Baldock, F.C.S.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 16,—Photo-mechanical Meeting,—Mr. H. Snowden Ward in the chair.

NEW FILM FOR COLLOTYPE WORK.

Mr. BULLEN showed and described the Gem Dry Plate Company's "A.-C." film, and pointed out its advantage for collotype work, and also for carbon printing, in that either side could be printed from, and a specially reversed negative was therefore unnecessary. The film consisted of pure gelatine, and would not swell or vary in size during development, the only point to be observed being that it must be put direct into the developer, instead of placing it in a wet dish and pouring the developer over it. In the smaller sizes it was sufficiently rigid to allow of its use in an ordinary dark slide, with a piece of card behind it. After fixing and washing, a bath of glycerine half an ounce, water one pint, must be used to ensure flatness upon drying. The base upon which the emulsion was coated was, when coated with plain gelatine, very suitable, instead of a gelatine skin in collotype, as it did not swell, and one was able to work to better register.

Mr. HERBERT FRY pointed out that some difficulty arose in deciding the proper strength for the glycerine bath, and suggested that a solution of loaf-sugar would be better adapted to the purpose, as sugar would always dry, whatever might be the strength of the solution.

Mr. BULLEN said he had not tried sugar; but, if too much glycerine was used, causing the film to become tacky, it could be removed by washing.

HALF-TONE AND OTHER PRINTING METHODS.

Mr. G. H. JAMES showed two half-tone prints made by an amateur, with a screen formed by blowing colour from an air brush on to a piece of glass, the screen being placed in contact with the plate, and the block printed in a Cropper press, without any underlaying, as rapidly as the press would work.

Mr. W. GAMBLE pointed out that these were not half-tone prints in the ordinary sense of the term, and that the method had the disadvantage that the block could not be improved by etching, as the fine dots which gave the delicate tones would be etched away, leaving only the coarse dots, and the result must therefore always be coarse in character.

The HON. SECRETARY (Mr. H. Wilmer) showed some prints (lent by Mr. Paul Waterlow) from intaglio blocks, in which the grain consisted of the ordinary bitumen grain, as well as the screen grain, which rendered it possible for the blocks to be printed in a machine.

The CHAIRMAN showed some prints lent by Messrs. S. Hildesheimer & Co., Limited, and printed by a similar process by the Rembrandt Intaglio Printing Company, of Lancaster.

The HON. SECRETARY said the use of the screen grain together with the bitumen grain enabled the wiping to be done in the machine instead of by hand, but he thought the wiping was not done with muslin, as in hand wiping, but by a metal scraper.

The CHAIRMAN thought he was correct in saying that, in the case of the Rembrandt Company's prints, the wiping was done in the machine, and that the printing was at the rate of 700 per hour.

Mr. GAMBLE thought the screen was in the nature of a film, which was placed in the printing frame—not in the camera—between the copper plate and the positive or negative that was used. Another way would be to print the screen grain first, and then transfer the carbon print on top of it, and etch the two together.

The CHAIRMAN said that the cost of producing an edition of 5000 prints, including everything, was considerably less than the cost of printing alone from ordinary photogravure plates.

INCANDESCENT GAS LIGHTING.

Mr. GAMBLE showed a modification of the incandescent gas lamp, having for its object the securing of a more actinic light from the Welsbach mantle, and which was claimed to be as good as acetylene, and to involve no more trouble or expense than an ordinary household burner. It could be attached to existing gas fittings, and breakages were readily replaced. The improvement consisted in securing a more perfect admixture of gas and air before reaching the burner, the utilisation of an increased volume of air, the heating of the mixed gas and air before reaching the point of combustion, better support and protection of the mantle from injury, increased draught, and concentration of the light by means of a whitewashed parabolic reflector. The air apertures were very much larger than in the ordinary burner, and the perfect mixture of gas and air was obtained by increasing the length of tube leading from the gas and air supply to the burner. The chimney was doubled in length by the addition of a mica extension, which drew the flame higher up, and more to the shape of the mantle, and also by the draught produced incandescence. Negatives and prints were shown to illustrate the practical performance of the lamp.

THREE-COLOUR APPLIANCES.

Mr. GAMBLE said the mistake made by most process workers in commencing three-colour work was that they wanted to take negatives before understanding anything about colour, and he advised any one who proposed to go into the subject to begin by a little elementary study of the spectrum, and he proceeded to show some appliances to assist them in this direction. These included several forms of pocket spectroscopes, a similar instrument applied to a camera for the purpose of testing colour screens, a series of colour screens, and glass tanks for filling with coloured solutions to form light filters. He also read a note by Mr. W. B. BOLTON upon the subject of

ORTHOCHROMATISING COLLODION EMULSION,

in which Mr. Bolton said that, contrary to previous expectation, he found that the orthochromatising very materially increased the general sensitiveness, and that the orthochromatic effect without a screen was marvellous. Collodion was far more susceptible than gelatine to colour sensitising, and, if he could manage to sensitise for green as well as he could for red and yellow, the emulsion would be applicable to ordinary out-door work with gelatine exposures.

A NEW RULED SCREEN.

The CHAIRMAN passed round for examination a new American screen, sent by Mr. P. Lawrence, of Farringdon-road, which had been ruled by Richards'

ig machine, and the meeting closed with votes of thanks to Mr. Bullen, Gamble, and the gentlemen who had lent prints and apparatus for bition.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ICH 11,—Mr. G. H. James in the chair.

r. A. E. Smith showed a single transfer carbon print produced from a itive obtained by exposing a plate in contact with the original negative, to it a yard of magnesium ribbon, which was sufficient to bring about reversal he image, and rendered it possible to dispense with the double transfer, rwise necessary to the production of an unreversed print by the carbon ess.

The Artigue Process.

Ir. James A. Sinclair, F.R.P.S., gave a demonstration of the method of iting by this process. With it no transfer whatever was involved, as with ordinary carbon processes, and the detail yielded was equal to that given printing-out paper. The paper or tissue was coated, Mr. Sinclair thought, h gelatine, and on this a layer of albumen, the pigment, which is in a very state of division, forming a separate layer on this latter. The paper, ugh appearing very black on the surface, is quite translucent on looking ough it, and the whole secret of success depended upon having a thin and n coating on the paper. The prepared paper cannot be purchased sensitised, this is of no moment, sensitising being quite easy. It is done by means of vo per cent. solution of bichromate of potash, with an immersion of two nutes, and no subsequent squeegeeing is required. It is important that the nperature of the sensitiser should not exceed 60° Fahr., or difficulties will p up which it is hard to overcome. If it should, the pigment leaves the ue, which, it must be remembered, is most delicate. The tissue is hung up dry, after sensitising, by a clip. Artigue has recommended sensitising the per from the back by painting it with a five per cent. solution; but, though nay seem far the best way, in practice it is not at all so, and Mr. Sinclair ch preferred immersion. The paper should be stored in a calcium tube en dry, and will keep almost indefinitely. To prove this, a print was shown ich had been sensitised on February 10, and printed on February 11, and not veloped until the night before the meeting. As with the carbon process, ne form of actinometer is necessary, amongst those mentioned being Sawyer's, rton's, and Wynne's, which latter was said to be one of the nicest made. velopment is conducted with a special sawdust mixed with water to a thin nsistency, which is poured repeatedly over the print, the action being to ig away some of the pigment according to the degree of light action. Three hes containing, respectively, cold water, warm water of about 85°, and the wdust mixture of about 65°, are required. Great latitude is afforded in velopment, it being possible, by varying the length of immersion in one or ner of the dishes, or omitting one, according to circumstances, to greatly odify and correct any fault from under or over-exposure in the result. The nperature of the sawdust mixture was a factor of considerable importance o. During the intervals of waiting some finished specimens were passed und which for range of tone and delicacy of detail could not easily be sur-ssed. The paper was usually left in the warm water until some evidence of e image appeared, and, should it be much delayed, it is better to warm up the uid a little. It is necessary to carry development to a much lighter tint than is desired the finished picture should exhibit, after which it is well washed d dried. It is then possible to form an opinion as to whether further velopment would be advantageous, and, if not, it is treated with a five per nt. alum solution, finally washed, and hung up to dry. If too dark still, e print can be developed a little more, and finished in the same way. The ocess is rather deceptive as to resulting tint, and it will therefore be found tter to examine the print in a dry state as described before treating with the um to get a proper idea of the final colour. As regards the process itself, r. Sinclair said it was interesting enough, but he did not think it was much ore, and had no great future before it. In reply to a number of questions it to him, he said that from five to ten minutes, as a rule, was sufficient for e operation of developing, but there were extreme cases which required ore. Providing it was kept free from moisture, the tissue would keep almost definitely. Asked why it was not, then, sold already-sensitised, he replied at the inventor was not at all anxious about a large sale, or one at all even, d it was indeed very difficult to obtain it in an unsensitised state. After e treatment with the alum solution, there was no fear of the pigment rubbing f, it appeared to be fixed permanently. The largest size which he had orked with was 12×10, and it was just as easy to manage as the quarter-plate ze with which he demonstrated the process. The negative which would best uit the process was a rather thin one, full of detail, one that would yield a od P.O.P. print.

Mr. Philip Everitt thought that the commercial value of the process had een under-estimated. He considered the results were as far superior to rbon prints as platinum to the very best bromide, and he saw no reason why success should not be made of it, from a commercial point of view, by a roper person.

Mr. Sinclair thought that the carbon process stood far and away ahead of e Artigue method; it did very well for direct prints, but not for enlarge-ents, but it was fifty times more difficult to work.

Mr. R. Beckett spoke in favour of the process, remarking that the prints ave as fine a range as any method. On his proposition, a cordial vote of anks was accorded to Mr. Sinclair.

PHOTOGRAPHIC CLUB.

March 3,—Mr. Thomas Bedding in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman welcomed Mr. Emil Kehle, a visitor from the U.S.A. Mr. Kehle has undertaken on March 17 to read a paper upon, and describe to the Club, his new self-toned printing paper.

Mr. Foxlee stated that the management of the Crystal Palace are organizing a Loan Exhibition to celebrate the "record reign." In connexion with this Exhibition, Messrs. Negretti & Zambra are collecting objects of historical interest in regard to photography. He (Mr. Foxlee) on their behalf, was anxious to secure the loan of old pictures, &c., and was especially desirous of old Daguerreotype and other out-of-date apparatus. No charge would be made for space for these photographic exhibits. Mr. Foxlee's address is 22, Goldsmith's-road, Acton.

Mr. L. Medland showed a five-inch focus lens by Wray. To this he had had a spectacle lens of negative focus attached, the general purpose being to enable him to photograph objects very close up without an undue extension of the camera bellows. His particular object was to be able to photograph animals at the Zoo, some of which were in shallow cages, and at very close quarters. He could, with a camera of ordinary extension, photograph an object thirteen inches away with the modified lens.

Mr. Hodd stated that he had made similar modifications of Goerz lenses for similar purposes, and found them work well. The added lens could be fitted into the lens hood, and fastened there with rubber moulding, such as is commonly used for fitting Thornton-Pickard and other shutters to the hood of lens.

Trade Night.

Mr. Smith, representing Messrs. Spratt Brothers, showed a capital selection of cameras and tripods, amongst which were a half-plate camera designed to work either as a stereoscopic or as an ordinary camera. The bellows extension was nine and a half inches. A point in this camera was the use of a rigid partition for stereoscopic purposes, which could, by a simple device, be quickly removed when required. Another feature was the provision in the camera front of a double rack-and-pinion movement for regulating the distance between the stereoscopic lenses—an obvious and useful improvement upon the rule-of-thumb method. The slides of this camera have a modification of the usual snap fastening, which so acts as to hold the shutter close to the body of the slide, and thus prevent the tendency to "leakage," which sometimes happens when the fastening presses against the slide. Price of camera, three slides, and tripod complete, 10*l.* 10*s.* A second half-plate camera shown by the same firm was provided with a sixteen and a half inch bellows extension, with aluminium fittings, and weighed but two and a half pounds. Price, complete, 11*l.* 10*s.* A third camera had a useful novelty in connexion with the rising front, viz., that in addition to the usual rising front, and attached to it, there was provided a loose front piece, which could be raised independently of the bellows. This is very useful when working with wide-angle lenses. A fourth camera was of the square landscape pattern, but was provided with a light-repeating back so as to combine in one instrument all the requirements of a field and studio camera. This promised to be a very useful addition. Messrs. Spratt Brothers also showed, amongst several useful tripod stands, an excellent fourfold light stand at the price of one guinea. The stand is very rigid, considering its weight and that it has four folds. It is fitted with a patent self-fixing device which prevents the legs collapsing. Messrs. Spratts' woodwork was of the highest quality and finish, and the instruments exhibited won general approval.

Mr. Tudor T. Hora showed the "De Melier" camera—an exceedingly neat, compact, and well-made instrument at a very moderate price, viz., half-plate camera and three double backs, four guineas; whole-plate camera, five guineas. The half-plate instrument was adapted for stereoscopic work.

Mr. J. E. Hodd (Spiers & Pond) showed a number of useful photographic articles as follows: A twin-lens camera, "The Twino," with an ever-set aluminium shutter, time and instantaneous; an achromatic meniscus lens (five-inch focus), and a finder showing full-sized image. This instrument complete with one double dark slide for quarter-plate sells for one guinea—the cheapest twin-lens camera on earth. The rational plate-washer, made in white granitine for twelve quarter-plates, 3*s.* 9*d.*, or half-plates, 5*s.*, promises to be a useful addition to the developing room. It is well made. It is provided with a lip to catch water from the domestic tap, and a siphon to drain it from the bottom of the tank in the most orthodox manner. Similar articles without lip or siphon are made to serve as fixing troughs. Wynne's print meter for carbon and platinum workers, 6*s.* This instrument works on the principle of Spurge's sensitometer, that is to say, by using a series of apertures graduated to pass a certain amount of light. Mr. Hodd also showed some samples of new mounts with effective impressed marks. These were very neat, very good, and very moderate in price, whilst the quality appeared to be excellent. Mr. Hodd promised a number of novelties in hand cameras for the next Trade Night.

Mr. Tylar's (Birmingham) representative, congratulated the Club upon boldly facing the trade question, and holding a trade night and calling it so. He promised to send some novelties for the next fixture, and passed round a very neat metal dark slide, which his firm were now about to issue with their pocket "Tit Bit" camera.

The Chairman briefly thanked the several gentlemen who had exhibited goods for an interesting and useful display.

The next Trade Night is the first Wednesday in May.

March 10,—Mr. J. R. Gotz in the chair.

Mr. Sidney Keith, of Fairlight, Witton, Middlesex, was elected a member of the Club.

Mr. J. H. Agar Baugh was proposed and seconded for membership.

The slides presented by Mr. F. H. Evans to the Club were passed through the lantern and were much admired. The members, by the courtesy of Mr. Snowden Ward, also had an opportunity of seeing the set of slides from Germany.

Mr. Harvey George, of Great Yarmouth, was introduced to the members. In acknowledging his reception, he said that the Local Committee of the Photographic Convention at Yarmouth would endeavour to make every one as comfortable as possible.

Borough Polytechnic Photographic Society.—March 10.—Mr. A. Bedding (Chairman) gave some useful hints on the working of Presto paper, a paper for rapid contact printing in dull weather or artificial light, and solar or limelight enlarging. The paper is exposed under the negative in very weak daylight (some distance from a window) or artificial light, until the very faintest trace of the image is visible on examining the print under weak gas or candle light.

Mr. Bedding made some exposures by gaslight, with the result that five minutes at a distance of about nine inches was found to be correct for a negative of average density. After exposure, the prints are developed with eikonogen, and the image, if properly exposed, comes up a reddish colour in about three to four minutes. Development should be stopped exactly at the desired depth of the finished picture by immersing in the ordinary hypo bath, as a Presto print does not reduce in the subsequent toning. The worker recommended the use of the combined toning and fixing bath as given by the manufacturers, as, unlike all other combined baths, it contains no alum or lead, without the help of which other papers refuse to tone, and therefore gives perfectly permanent prints.

Hackney Photographic Society.—March 9, Mr. C. T. Fleetwood presiding.—Mr. Bullen, of the Gem Dry Plate Company, gave a demonstration of the new

Anti-celluloid Film.

After briefly reviewing the progress of film photography from its earliest stages to the time of the celluloid film and referring to some of the faults of the latter, such as costliness and bad-keeping qualities, Mr. Bullen claimed that the new A. C. film was a great improvement. The support consisted of gelatine rendered insoluble and impervious to moisture; it contained nothing that could be injurious to the sensitive emulsion, and so would not impair the keeping qualities of the latter. The price was about the same as that of plates. The film remained quite flat whilst in the developer, and the manipulation was exactly the same as for ordinary films, except that the A. C. film must be wetted on both sides by immersing in water before placing in the developer. After fixing and washing, the films must be dipped in a solution of glycerine—about half ounce to the pint of water—and then hung up to dry. Drying would take about six hours. Varnishing was optional, but desirable. The examples shown at the meeting by Mr. Bullen were very good.

North Middlesex Photographic Society.—March 8, Mr. J. MacIntosh in the chair. Mr. G. J. Haviland was elected a member of the Society, and Messrs. J. H. Avery and F. W. Meise were nominated for membership. Mr. Ernest Benest then read a paper on

The Chemistry of Development.

He treated a somewhat dry subject in a very lucid manner, and explained the generally accepted way in which the development proceeds on the light starting the action in the film, making the point clear by means of diagrams on the blackboard. He pointed out the essential difference between the wet-collodion and the dry-plate methods of development; in the former the image is built up on the surface of the film, while in the latter it is formed in the body of the film. In answer to a question, he detailed an experiment, in which precipitated silver was spread upon a dry plate, covered with a sheet of paper, and a design traced on it with considerable pressure, the silver apparently combining with the bromide of silver to form the sub-bromide, which was amenable to development. A discussion took place on the theory of reversal and other points raised, in which Messrs. Mummery, Mattocks, MacIntosh and others took part. Mr. Ainsley showed a print on gelatino-chloride paper from an ordinary negative, which showed distinct reversal, while another print from the same piece of paper was all right.

March 15.—Mr. H. Smith in the chair. Mr. E. R. Mattocks read a paper on

The Use of Various Printing Processes.

As this was an Instruction Evening, his remarks were specially intended for beginners, showing them what process would best suit particular negatives. His favourite negative was one fairly plucky, full of detail, but inclining to thinness. He gave in a tabular form the various densities and processes best suited to them. The thinnest negative, collodio-chloride; negative thin but with detail, gelatino-chloride and P.O.P. generally; soft negative tending to thinness, platinum (cold bath C. C.); moderately thin but with contrast, bromide (contact by gaslight); a vigorous negative (medium), platinum (A.A. and hot bath); a strong negative, bromide (good print by contact, daylight); strong and not too dense, carbon; plucky but not yellow, albumenised silver; hard and strong negative, weak sensitised silver paper. In the discussion which followed, Mr. J. McIntosh called to mind that Captain Abney had said that carbon tissue printed quicker in proportion to silver paper in winter, and yellowish light, than in bright summer weather, owing to the fact that in the sensitised carbon some of the yellow and greenish rays were absorbed and consequently did work, while only the blue rays affected the silver paper. Mr. A. J. Golding put in a plea for permanent prints, saying carbon prints could be considerably modified by weakening or strengthening the sensitising bath.

Ashton-under-Lyne Photographic Society.—March 9.—The lecturer was Mr. J. T. Lees, of Dukinfield, and his subject was

Spain.

To lecture on Spain without introducing something about the bull fights would be difficult, if not impossible. We should think a tourist who could travel a whole month in Spain without succumbing to the temptation to behold one of these fights would be no ordinary mortal. He would be very differently constituted from the common run of men. Mr. Lees availed himself of the opportunity, and witnessed a fight. Now, having got a few slides of his own, and manufactured a number more from a collection of coloured prints obtained in Spain, it would have needed more than usual human restraint to have kept back from giving his friends at home whatever benefit they could derive from them. The result, no doubt, is painful to some sensitive people, just as it would shock many to witness some vivid representation of the Armenian horrors. The Chairman spoke of how demoralising these fights must be to the spectators. One remove further in one's reflections suggests that, if the actual spectacle is demoralising, the lively presentment of such scenes on the screen might, too, have a similar tendency. At all events, the lecturer is bound to neutralise any such tendency by accentuating his reprobation as much as possible. Unfortunately, when one has seen a grand prize fight or bull fight, he is more apt to be impressed with the extraordinary address and dexteri of the performers than with the cruelty. Mr. Lees had much more to about this than the sufferings of the animals. Of course, he did not want "harrow up their feelings." Through kindness he forbore, but it was, we a afraid, a positive duty not to forbear. At the close, this aspect of the que was brought forward when a vote of thanks was being passed. Mr. Gla brook did so "with mixed feelings," and thanked God that he had been bo in England, where the law would not tolerate such things.

Cardiff Photographic Society.—A competitive Exhibition of membe work was held at the rooms in Working-street on the 12th inst. The whole the work submitted was of average good quality, while some of the specime sent showed a high standard of merit. A measure of interest was infus when the members were invited to express their criticism of the work, a unstinted praise was not bestowed at random. In spite of one or two we points, very little fault could be found with the majority of the exhibits, a the competition for lantern slides showed very equal merit in the work Messrs. Bancroft and Harris. The award went, by general consent, to M Bancroft, who also secured the verdict for marine studies. In the landsca class, some very fine work by Mr. E. W. M. Corbett took first honours, Mr. Har receiving a special prize for a nice set of prints. The evening must be voted successful departure from the ordinary run of club meetings, and a repetiti of it would probably be well supported. On this occasion the competition w reserved to those members who had never previously secured an awar Another time it might be open to the whole of the Society.

Leeds Camera Club.—March 10.—Mr. W. T. Wilkinson, in referring to

Photo-zincography,

briefly, but clearly, recounted the various stages of producing zinc and copp blocks in line and half-tone for printing with letterpress. The simpler meth known as the line process, consists of reproducing in relief the black lines o drawing upon a white ground, the effect of gradation or half-tone being pr duced by the varying amount of space left between the lines and the thickne of the lines in the drawing. From such a drawing (made with absolute black ink upon a perfectly white paper) a reversed negative must be made, means of a reversing mirror or prism. Until recently, the wet-plate proc was considered essential for the production of such negatives, but now d plates are specially made for this branch of photography that yield equal good results, and for these Mr. Wilkinson recommends hydroquinone a sodium carbonate developer. A zinc plate is then polished, grained, coat with albumen sensitised with ammonium bichromate, the superfluous soluti being removed by whirling or rapidly rotating the plate when in a horizont position. It is next exposed, when dry, under the negative for five or t minutes, rolled up with photo-transfer ink, sponged off, and dusted over wi fine dragon's-blood gum, which is rubbed well in, and then heated until t gum melts. It is then etched for the first stage, again gummed up, rolled with litho ink, and further etched. When broad masses of white occur in t plate, these are cut out with the "router," which obviates very deep etchin and the consequent risk of undermining the lines. In half-tone work, t printing block can be made from an ordinary photograph or wash drawing glass screen, ruled with crossed diagonal lines from 80 to 170 lines to the in (that generally adopted being about 125 to the inch), being imposed betwe lens and plate, the distance being adjusted to suit the special requirements the negative and block to be made. The after-processes are very similar those employed in line etching, but more care is necessary in the etchin Mr. Wilkinson afterwards exhibited a number of excellent negatives, wi prints therefrom, made on Wellington negative paper, a new and cheap ba for supporting the sensitive emulsion, and one destined to supersede the m expensive celluloid film. After development, the paper negatives may printed from without any waxing or other preparation, the necessary exposu being about fifteen per cent. longer than through a glass negative.

Leicester and Leicestershire Photographic Society.—March 11.—T two chief featnres of the evening were an account of the new "A. C." fil given by Mr. T. E. H. Bullen, of the "Gem" Dry Plate Company, and exhibition of hand cameras. The affiliation lecture on

Hand-camera Work,

by Mr. W. Thomas, was also read. Mr. Bullen prefaced his description the new film by an account of several earlier attempts to produce an insolu gelatine film which should be suitable to form a permanent support fo sensitive emulsion, and showed a number of very interesting examples what had been done in this direction. After mentioning the disadvanta of celluloid, he described his own invention, and showed many negativ and also developed some positives in presence of the meeting. In reply t question, he stated that he thought that, in the smaller sizes, the films mig be used reversed for single transfer carbon work. He also showed stripp films from "Gem" stripping plates, which could be used from either side all sizes. To the show of hand cameras the following makers and deal contributed: Messrs. Shew & Co. (the "Eclipse." "Focal-plane Eclipse," a "Xit"), Mr. Lizars (the "Challenge," and a magazine camera), the Europe Blair Camera Company (the "Hawkmoth"), Messrs. Thompson & Co. (t "Infallible"), Messrs. Marion & Co. (the "Camrana" and "Radial"), a Messrs. Young, Heath, Pickering, and Newton.

Liverpool Amateur Photographic Association.—Among the amateur pl tographers of Liverpool, Mr. Paul Lange's new lecture is always one of t chief events of the year. His unique reputation as a maker of lantern pictu and his racy style as a narrator ensure a bumper house whenever he takes t platform, and the meeting in the City Hall on Thursday evening, March was no exception to the rule. The President (Dr. J. W. Ellis) occupied t chair, and every available corner was occupied. The first part of the ent tainment consisted of a short musical programme arranged by Dr. Llewell Morgan, and included a spirited and musicianly rendering of F. Clay's "San of Dee" by himself, several songs by the Rev. Maurice F. Bell and M Branscombe, and violin solos by Miss A. Threlfall, Miss Ward and Mr. B acting as pianoforte soloists and accompanists. So uniformly excellent w the various items that, though everybody came to hear Mr. Lange,

dience was shown—the highest possible tribute of praise under the nstances. Mr. LANGE's subject was *Adriatic Borderlands*, under which ne recounted the chief incidents of a trip last summer from Trieste, down astern coast of the Adriatic to Montenegro and the borders of the Turkish re. About 130 admirable lantern slides from photographs taken during rip furnished a delightful pictorial commentary on the lecturer's crisp ntertaining narrative, which held the audience fully interested until the when, as a *bonne bouche*, Mr. Lange showed a number of charming tian subjects.

wcastle on-Tyne and Northern Counties' Photographic Association. rch 9, Mr. W. Parry (President) in the chair.—Mr. J. P. GIBSON (ex-lent) gave a lecture on

PRINTING-IN CLOUDS,

he reputation of the lecturer in landscape work drew a large audience of ers. Commencing with what he called the *bald-headed landscape*—one a white sky and the obvious falsity of such a rendering—he commented e difficulty of securing natural skies in one operation, except in river and le work, although much might be done by the use of isochromatic plates yellow screen. Very seldom, however, did even this course give the best from a pictorial standpoint. In ninety-nine cases out of 100 he print in a better and more suitable sky than the one which was there e moment of taking the photograph. Premising that a really suitable appened to be there, he recommended bringing out the image with a developer until the sky was nearly developed far enough, and then ing it over with a bromide restrainer, followed by local development of ndscape with a stronger developer. Most of the commercial cloud nega- were too dense. The proper thing to be aimed for was to keep the image so that it would print quickly. He counselled the members to be con- lly adding to their stock of cloud negatives. He himself had thousands, e used up his stale plates in this way. The selection of the cloud to be oyed was next considered. It should, first of all, suit the lighting of the cape; and, secondly, its lines should be such as to help the composition picture. He mentioned an instance of how he once took a negative h he thought was up to exhibition standard, if he only had a suitable sky ive for it; but amongst all his large stock no such sky could be found, and d to wait three years before he got one to suit. Then the medal followed. the actual printing in, there were many methods. There were cumbrous ds of masking and registration, which he strongly deprecated, and he d his own simple and easy way of doing it. He placed his landscape on the hinged back of a printing frame, adjusted the cloud negative, the arrangement by two spring clips, and boldly went into the sunshine, tting the sky into the landscape by means of an ordinary focussing cloth. s only a matter of a few moments, and the work was done. It was neces- o print considerably deeper than usual, as, on account of the thinness of egative, there was a greater reduction in toning and fixing than would be se if a stronger negative were used. Having now got the sky printed in, was something else which required attention. If you possessed a fine tion of blue china, you must live up to it, and if your landscape was ified by a fine sky, your picture must live up to its sky. In other words, ndscape must be harmonised and its faults put right, any obtrusive must be sunned down and brought into general unison with the sky, n the case of a water foreground, the cloud negative must be turned over printed upside down through the glass into the water portion of the re. Mr. Gibson subsequently showed a large collection of lantern slides ustration of his various points.

FORTHCOMING EXHIBITIONS.

1897.

3-May 1 .....*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.

19 ..... Beverley Photographic and Sketching Society. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

THE VICTORIAN EXHIBITION AT EARL'S COURT.

To the EDITORS.

NTLEMEN,—The Council of the Royal Photographic Society have nted, at the request of the Committee of the Victorian Exhibition, is to open at Earl's Court in May of this year, to organize a col- n of photographic objects illustrating the history of the science. this Exhibition is to be held on the sixtieth anniversary of Her ty's reign, the Council are most desirous that a thoroughly valuable epresentative collection should be got together. rust therefore that any of your readers who have objects of interest rating the history of photography will co-operate with the Society in ng them for exhibition. Every care will be taken of such exhibits, those which are accepted will be returned to them, unless their s direct otherwise, at the close of the Exhibition. Articles intended hibition should be addressed to the Secretary of the Society, at 12, ver-square, London, W.—I am, yours, &c.,

H. WILMER, *Hon. Secretary.*

Hanover-square, London, W., March 13, 1897.

AN ADHESIVE FOR FABRICS AND METALS.

To the EDITORS.

GENTLEMEN,—It occurs to me that it may be a convenience to some of your readers to know that any fabric of moderate thickness can be securely joined to metal with the solution of gutta percha in bisulphide of carbon, which is used or sold by many shoemakers for joining leather.

I have recently hinged the metal divisions of my dark slides to the frame with this material and stout ribbon, and find the joints perfectly strong and firm.—I am, yours, &c., T. STOKOE.

Clare, Suffolk, March 12, 1897.

ANIMATED PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I see by Mr. Donisthorpe's letter, in last week's JOURNAL, that he says he has been "rummaging over back numbers," and takes exception to my not coupling his name with Mr. Crofts in respect to an apparatus he names—the kinesigraph. I am afraid your correspondent does not read the LANTERN RECORD regularly, and, if his "rummaging" had extended a little further back, he would have found due credit given to him as the first inventor, as far as Patent Office records go, with Mr. Crofts, for apparatus to produce and project large films of animated photographs (see LANTERN RECORD, July 3, 1896). I had always heard the apparatus spoken of as "Crofts," and this was probably because, according to Mr. Donisthorpe's letter, Mr. Crofts had the supervising of the construction of the apparatus. I am glad to know the idea originated with your correspondent.

Those who, like myself, have had to do with many patents, and many inventors know how much the latter are indebted to the mechanician or constructor for making practical their ideas, and licking into shape the original models, which often are, when made, quite impracticable; and, therefore, seeing that Mr. Donisthorpe was described as barrister of law, I may be excused for imagining he occupied the place so often taken by lawyers in patent cases, and was the financial partner in the matter, especially as in trade reference the instrument was spoken of as Crofts. I regret I got off the path over the latter's domestic life, and imagined he left a widow behind when he was a bachelor.—I am, yours, &c.,

March 16, 1897. G. R. BAKER.

To the EDITORS.

GETLEMEN,—I have read with interest the letter in your last issue, signed "Wordsworth Donisthorpe," and I would suggest that it would be of interest to a considerable number of your readers if he would furnish you with the patent specification, which he seems to think is a master patent over all others, and also it would be of interest if he exhibited, say, at the Royal Photographic Society, some of the results he secured.

Every Tom, Dick, and Harry is now claiming to be the inventor and first exhibitor of these animated photographs, and I can fully sympathise with Mr. Wordsworth Donisthorpe, inasmuch as some one else has obtained credit for his invention. My own experience with various adventurers is not unique.

I must, however, protest against the last paragraph but one of Mr. Donisthorpe's letter. I presume from it that he is a barrister, but it will be time enough for him to refuse to defend a patent when he has been applied to.—I am, yours, &c., BERT ACRES.

The Northern Photographic Works, Salisbury-road, Barnet, London, March 13, 1897.

MISLEADING REPORTS.

To the EDITORS.

GENTLEMEN,—In the report of the meeting of the Croydon Camera Club, as printed in your last issue, the reporter says: "As regards a fancied trouble due to an exaggerated notion of the want of keeping quality of the paper, Mr. Kough showed prints which were developed seven days after exposure, and seemed none the worse for the keeping; the so-called continuing action, had, apparently, not appreciably injured the image." Surely this sentence is somewhat ambiguous and mixed, and, moreover, it did not emanate from either of the gentlemen who took part in the demonstration of the evening, *i.e.*, "Carbon printing." The *keeping qualities* of the paper are quite distinct from the *continuing action* (of light), though the reporter omits this. Every one knows that carbon tissue *unsensitised* will keep for a long time, but the *sensitised* tissue will not keep for more than ten to fourteen days without becoming more or less insoluble, and, consequently, unsatisfactory to work. Then, again, the continuing action of light, first observed by Captain Abney, is designated *so-called*, and half ridiculed, as though it were not a fact at all. I think it would have been better if your reporter had tested some of Mr. Kough's prints, when freshly printed and at the expiration of the seven days; he might possibly have found that in the former case they were *under-printed*, at any rate he would have been more competent to express an opinion. I am not aware that any one has ever said that this continuing action of light goes on for ever.—I am, yours, &c.

St. Leonard's-road, Croydon. J. H. BALDOCK, F.C.S.

A REJOINDER.

To the Editors.

GENTLEMEN,—"Hercules" asks in your last week's issue if I have no sense of humour. Well, if a sense of humour implies a capacity to laugh at drivel, then I confess to being without it. He also ascribes to me certain criticisms which are not mine. This he could have ascertained by reading the paragraph at the head of the matter referred to, which runs as follows: "The critic is not a single individual; but the Editor has secured the services of about a dozen gentlemen," &c.

To those two mottoes, which he proposes to hang in his studio, I suggest the addition of a third, which, being in plain English, would act as a foil to the others: "The first ingredient in conversation is truth, the next good sense, the third good humour, and the fourth wit."—I am, yours, &c., MATTHEW SURFACE.

Bradford, March 15, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Richard Williams, 104, High-street, West Bromwich.—*Photograph of silk tapestry illustrating a female draped figure.*

PYRO STAIN.—T. J. C. Your experience is very general. It is better to avoid the stain, in the first instance, by a more liberal use of sodium sulphite.

PLATINOTYPE.—T. BELL. There are two faults in the prints sent. One is, that they are much too deeply printed; the other is, that the paper was exposed to damp some time before it was printed. The remedy is obvious.

TURMERIC.—CURCUMA, he says, is interested in the note on Turmeric in the ALMANAC, especially as regards its capabilities for a gravure resist. Could we give further details to help in experimenting?—All the writer has published on the subject is contained in the note referred to.

CYANIDE FUMES.—CYANIDE says: "I should be much obliged if you would inform me if it is possible by any means to do away with the smell of cyanide of potassium without affecting its action."—There is no way of rendering cyanide of potassium inodorous without injuring its properties.

APPRENTICE.—C. R. W. As the so-called indentures were not stamped, they are in no way binding on the apprentice, and he can, as he asserts, legally leave on giving a week's notice. If, as he alleges, he is not being properly taught the business as agreed, no one will blame him if he acts according to his rights and leaves.

COPPER ETCHING.—STENCIL asks: "Can you give me a formula for an etching bath suitable for etching copper stencil, or the name of any book published wherein I can find description of the process?"—Nothing is better than a solution of perchloride of iron for copper etching. We know of no work on etching as applied to stencil plates.

PLATINO RESIDUES.—ALFA writes: "Could you kindly inform me whether trimmings of platinum paper and old platinum developers are worth saving?"—Yes, if working on a commercial scale; but, if only worked as an amateur works the platinotype process, the residues are not worth the trouble of saving and afterwards recovering the metal from them.

ACETYLENE.—SOUTHENER. As artificial light, to a limited extent only, will not be required for portraiture for some months to come, we should recommend you to wait further developments, particularly in face of the restrictions placed on the use of acetylene by the fire insurance companies, and as regards the storage of the calcium carbide by the Home Office.

PROCESS WORK.—H. H. S. So far as one can judge from the impressions sent, you are on the right track, but you must not expect to reach success under the conditions you are working. You must have a properly ruled screen, and the more perfect it is the better will be the results. Wire gauge, and suchlike thing, is of no use for modern process work.

EQUIVALENT FOCUS.—NOVICE says: "I should esteem it a favour if you would kindly inform me the simplest method of finding the focal length of a portrait lens (Dallmeyer), in order to get at the *f* value. The general rule, I believe, is to focus on some distant object, but with a portrait lens would that method answer?"—The simplest way, perhaps, in "Novice's" hands will be to put up an object in front of the lens, and extend the camera until its image is obtained sharp, and of the same size, on the focussing screen, as in copying same size. Then measure the distance between the object and the ground glass. That divided by four will give the equivalent focus of the lens. This method is not strictly accurate, but it is near enough for all practical purposes.

TRADE.—1 and 2. We know very little of either; probably No. 1 is bett although we must not be understood to recommend him. 3. A mont we should think, would be absolutely useless; send us one or two spe mens of your work, and state the terms upon which you are desirous being engaged, and we may be able to form an opinion likely to be more service to you.

WOODBURYTYPE.—A. RICHARDSON. The impossibility of developing reliefs is due to the tissue being insoluble through, probably, its bei too long in drying. It should not take four days in drying o chloride of calcium, nor would it do so, if the chloride were dry to be with and plenty of it were used. With the same materials and qui drying you ought to meet with no difficulty on the score of insolubili

SWEATING.—OVERWORKED. If the facts be as stated, the Factories Acts being flagrantly violated in the works in which you are employed. is illegal to keep females and young persons at work for twelve hou a day for six days a week, with only an hour off for meals. Also, it a violation of the Acts not to have an abstract of the Acts suspend at the entrance of the works, &c. If you write, even anonymously, the Factory Inspector's Office, London, S.W., the matter will be quick seen to.

WATER RATE.—WEST LONDON. As the water is used only in the place which your firm do their printing, more especially as the house is n used as a dwelling, we do not see how you can resist the Compan right to supply the water by meter. They can do so in all cases wh water is used in large quantities for trade purposes. As the house but a small one, and is rated low, the new arrangement will materia increase the water rate. But it can't be helped; it would be no resisting, of that we are assured.

STAINED PRINTS.—PRINTER writes: "I should be greatly obliged if you co explain the cause of stains on enclosed prints. They are printed Paget P.O.P., thoroughly washed, salted, and washed again, ton washed in three changes, fixed, alumed, and washed for two hours. have a few in every three or four batches discarded for stains, so wou be glad if you could explain the cause."—The stains are caused by t prints being allowed to stick together while in the fixing bath, so th the solution does not have free action. The remedy is obvious.

SALE OF BUSINESS.—DOUBTFUL. In the valuation of the business, it see that the valuer put down the book debts at a certain amount. If y fail to realise that sum, we fear you have no redress, unless you c prove that there was a fraudulent misstatement in the matter. valuing book debts, a certain amount must be allowed for as doubt or bad. If they are not estimated as such, a number of them usually found, when applied for, to be so. Book debts must always looked upon as a doubtful purchase, and discounted accordingly.

TONING COLLODIO-CHLORIDE PRINTS.—G. WARD. Combined baths, containi alum and lead, may be used for toning collodio-chloride prints, li their use is to be deprecated on the score of doubtful stability in t results, the same as is the case with gelatine papers. If the forei brand you are using will not yield good tone with separate toning a fixing, we should advise you to adopt some other brand that will. Y are, of course, assuming that stability of results is a desideratum greater importance than the cost of a shilling or so on each quire paper.

PHOTOGRAPHING DOG.—W. BLISSARD. Yes. There would be no difficulty photographing a dog by a flashlight; indeed, if rightly managed, would be about the best way of doing it. Pose and focus the animal its favourite place in the room; then, when all is ready, fire the char and the photograph will be secured before the dog has had time move. It will be necessary to make sure of getting a good result at first trial, as it is quite possible "doggy" may be a little nervous some time afterwards if he notices similar operations in progre Animals do not like sudden lights or noises, and some are very nervo with regard to them.

DESIGN FOR STUDIO.—J. L. & Co. say: "We are building a studio, the wi being twelve feet, and the full length twenty-five feet, but, there bein small kitchen in the way, five feet out of the twenty-five feet will only six feet wide; there is a wall four feet high on the east or kitc side. Would you have the side light on the short or east side dow the wall, or on the long side? and what amount of light do you rec mend for the side? And do you think nine feet in length of skyl would be too much for this size studio? thanking you for reply. If the principal part of the work is likely to be done in the morning, should say, Glaze the west side. If in the afternoon, the other nine f of top light will not be too much. Twelve or thirteen feet will b convenient length, for working, for the side light.

STUDIO.—DOUBTFUL says: "I am about to build a studio, and should greatly obliged if you would kindly tell me how much glass I ought put in side light, also height of eaves and ridge. I enclose a rou sketch for guide. You will see I have a space of twenty-one feet tween two rooms, which has an uninterrupted north light. It is ten f wide. I know this is rather narrow, but it cannot be helped. T rooms at either end are not lofty enough to take a background, so I doubtful about how much of the side and top I should glaze. Will y kindly, therefore, say (to make the most convenient place to work i 1. What height studio shall I make to ridge? 2. What angle sho the roof be, or what height to eaves? 3. How much shall I glaze? want to be able to work from both ends, if possible."—In reply: About eleven feet six inches or twelve feet. 2. About nine feet. Have, say, five feet at either end of the roof, and four feet at the si opaque; the rest may be glazed. These proportions will be suitable, you desire to work from either end.

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EX CATHEDRÂ.

We understand that the Photo-process School, Bolt-court, E.C., will be open on and after Monday, April 5, for day instruction from 10.30 a.m. to 5 p.m. Intending students may enter for separate courses only, or may also make arrangements for regular practice under the guidance of the Director. For students who devote their whole time to the work of the school, a composition fee of 1*l.* a month has been arranged, and this admits to the various classes at the discretion of the school authorities. Students entering for separate courses are allowed time for practice, in addition to the class times by arrangement with the teachers. Full particulars may be had upon application to the Secretaries at the school, 6, Bolt-court, Fleet-street, E.C., or to the Secretary of the Technical Education Board, St. Martin's-place, W.C.

* * *

When making our last allusion to the Institute of Photographic Artists of 61 and 62, Chancery-lane, we omitted to note that changes appear to have been recently made in the directorate of that mysterious institution. The President is now "Emile August Dünki, Esq, 2, Parifal-road, Hampstead, London, N.," and he is also a director, having for colleagues "J. Kemsley, Esq., A.M.I.E.E., C.A.S.I., &c., 76, Queen's-road, Bayswater, and 41, Park-place, Kensington Gardens, W.;" "Charles Webb, Esq., Rockfield Villas, Jersey;" and "Henry Snowball, Esq., 7 and 8, Southampton-buildings, London, W.C." Mr. Kemsley's name appears in the *London Directory* as a sanitary engineer. We cannot trace the other gentlemen, but perhaps some of our readers can assist in their identification, as it is surely desirable that the directorate of a photographic institute should not remain unknown to photographers.

* * *

The editor of the *Graphic* has sent us advance copies of the pictorial supplements to that journal, which contain reproductions of some of the successful photographs submitted for the second amateur photographic competition lately held by our contemporary. The competitors, it appears, numbered some thousands; and it is happily our contemporary's experience that amateur photographers are no longer content with the crude and inartistic pictures that once passed muster, but, both in choice of subject and its treatment, show that they have grasped the artistic possibilities of photography. Our contemporary adds, "There is generally an advance in the merit of the works sent in this time upon those received on the occasion of our first competition. Many of the pictures sent in are really works of art, admirable not only as being beautiful pictures, but also as showing artistic skill on the part of the producer."

* * *

The winner of the first prize of 20*l.* was Mr. Henry Stevens, of Addlestone, who, forsaking his favourite dogs, cats, and flowers, has produced an effective and sympathetic photograph termed, appropriately enough, "Worn Out." It depicts an old lady seated in an old cart, which is drawn by a donkey. Either the animal or the vehicle may reasonably be supposed to be indicated by the title of the photograph; but there is no room for doubt as to where its applicability principally lies. The bowed figure of the sad and wrinkled-faced old dame, eloquent of age and decay, obviously suggested the title of the picture, which is a capital bit of work. The other reproductions given with the supplements make it easy to believe that the competition was a good one.

* * *

An Edinburgh friend sends us a report of the latest case in which the Pharmaceutical Society has enacted its sinister *rôle*

prosecutor. Five apprentice lads were recently summoned for selling certain advertised preparations containing scheduled poisons. The report is printed in our News and Notes column. It does not appear why the employers of these lads were not proceeded against. The sheriff before whom the summonses were heard had some severe observations to make with regard to the latest method of administrating the Pharmacy Act adopted by the Pharmaceutical Society. After apprentice boys, who or what is there left for the Society to prosecute, unless it petitions Parliament to amend the act so as to include the actual manufacturers of poisons and the very earth which yields up the elements of which those poisons are composed? We wish our contemporary, the *Chemist and Druggist*, every joy of its *protégés* of Bloomsbury-square.

* * *

The last number of the *Kodak News* contains the announcement that, for the convenience of customers whose business is in the City of London, the Eastman Photographic Materials Company has opened a branch house at 60, Cheapside, E.C.

* * *

We are informed that Mr. E. W. Foxlee has undertaken for Messrs. Negretti & Zambra the organization of the photographic section of the Victorian Loan Exhibition, to be held at the Crystal Palace from May to September next. The authorities are to be congratulated on having secured the services of Mr. Foxlee, as that gentleman's practical acquaintance with photography has been long and comprehensive. Mr. Foxlee's address is 22, Goldsmith-road, Acton, W., or care of Messrs. Negretti & Zambra, Holborn-viaduct and Crystal Palace, and he will be glad of the loan of historical specimens, or old apparatus illustrating the various photographic processes. We have reason to believe that the photographic section of the Crystal Palace Victorian Loan Exhibition will be very complete and interesting.

* * *

The foreign newspapers have, of course, published accounts of the colour processes that are at present undergoing exploitation in this country, and those accounts have had the inevitable effect of provoking scepticism in the minds of those who know anything about photography. We subjoin the copy of a letter which may be accepted as typical of several that have been addressed to us on the subject:—"Enclosed please find a cutting from a Berlin newspaper, dealing with a lecture by Sir H. Trueman Wood, on February 24, at the Society of Arts' meeting, upon photography in natural colours, and the subsequent claims of a Mr. Bennetto. Can you please give me further information as to whether there is any truth in the matter, or is it merely a newspaper hoax?" We may add that *The Berliner Tageblatt*, the newspaper referred to, contains an account of Mr. Bennetto's claims, and a reference to the "test" he was subjected to, such as was recently given in *The Times*. Under all the circumstances of the case, our correspondent's question is not unnatural.

* * *

Messrs. Voigtländer & Son, the well-known opticians, of Brunswick, have opened a London house at 92, Hatton-garden, E.C., of which Mr. J. H. Agar-Baugh is the manager. Besides three series of the Collinear lens, tele-photographic lenses of medium and extra rapidity and three series of portrait lenses are included among the firm's specialities in photographic productions, to which we shall refer in detail on a future occasion.

A NOTE ON COLOUR SCREENS.

A perfect colour screen would seem to be one composed of perfectly homogeneous glass, with the two surfaces optically worked to accurately parallel planes, and, if suitable colour could be arrived at, self-coloured. But, as such worked plates are necessarily expensive, and in the growing needs of orthochromatic and three-colour work demand a variety of colours and these are not produced with certainty by the glass-maker it is necessary in every-day practice to be content with substitutes, which, while not coming up to the requirements of scientific perfection, yet give sufficiently good results to satisfy all practical purposes.

Failing the ideal screen, we have a choice of makeshifts, the chief of which consists of coloured films spread upon glass, and tanks or cells of glass to contain solutions of selected tint. The films, too, may consist of various kinds of varnish, collodion, or gelatine, each of which has its advantages or its advocates, while the choice of coloured solutions is almost limitless. But in all cases we have to fall back upon glass of as perfect a quality as possible as the basis. Clearly, as already suggested, where a variety of different screens are required, it is next door to impossible to have them all of optically worked glass, so that we are compelled to fall back upon the best substitute, which is found in thin plate, which may, without any great addition to its cost, have its surfaces ground and polished with a little extra care. Then, by picking those pieces which are the freest from bubbles, and similar flaws, it is possible to obtain an equipment of screens at a comparatively small cost that will answer for practical purposes almost as well as the more expensive.

In selecting the glass for this purpose, even after rejecting all that exhibits visible defects, we have still to reckon with the want of parallelism of the plane surfaces, and, though for most ordinary work any slight departure from absolute accuracy in this respect will probably not produce very serious results, it is still desirable, especially in the case of tanks, to come as near to accuracy as conveniently may be. In examining the glass for parallelism the method of measurement, even if a delicate micrometer be employed, is scarcely available, but fortunately there exists a very simple plan by which the approximate departure from accuracy in the two surfaces can be quickly recognised.

If a sheet of clear glass, both sides of which are polished, be held at an angle with the eye so that the reflection of a lamp or candle flame is seen, a double image will be presented to the eye. If the glass be coloured, or if the back surface be coated with a transparent coloured medium, the secondary image, or that reflected back through the glass, will be coloured, and under these circumstances the examination of the screen for parallelism will be greatly facilitated. Most of our readers will be quite familiar with the double image referred to; but probably not all are aware that the relative positions of the two reflections will vary according to the direction in which the glass is viewed, but such is the case in fact.

Let us take, say, a quarter-plate, and, holding it at an oblique angle, with a lamp flame in the direction of its longer dimensions, note the relative positions of the two reflections.

If one side of the glass be coated with coloured varnish or collodion emulsion, the colouration of the secondary reflection will render this observation easier. Let us suppose the coloured image overlaps the other on the *right*-hand side. Now reverse the plate and look along it in the opposite direction lengthways, and it will be found that the coloured reflection is also seen on the opposite or *left*-hand side of the primary one. Now repeat the observation crossway of the plate, or in the direction of its shorter length, when it will be found that the two images overlap in the direction of their lengths, instead of sideways; in other words, that the tip of one or other of the flames will project in advance of the other according to the direction in which the glass is held.

To make a more elaborate, though unnecessary, experiment. If the glass be cemented on to an accurately turned surface, and mounted in the lathe, so that one of the reflected images is absolutely centered, on setting the lathe in motion the centered image will remain stationary, while the other revolves round it, or the same effect may be observed, with more difficulty, by revolving the glass with the fingers.

This alteration of position of the two images is mainly due to the want of parallelism of the two surfaces of the glass, and is more or less noticeable in proportion to the degree of departure from accuracy and *the thickness of the glass;* for clearly, with a certain amount of inclination of the surfaces, the separation of the two images will be greater the further the secondary one has to travel through the glass. Hence, in selecting a piece of glass, other things being equal, we should select the thinnest. It is seldom, except in the case of accurately worked plates, that this double image and alteration of position is not visible, but we have a thin screen of coloured glass in our possession which is so nearly accurate, although only picked from thin plates, that no secondary image can be detected, though two or three other samples from the same source show it.

Speaking of the thickness of the glass reminds us that a suggestion was made in these columns some years ago to employ for this purpose, thin microscopic cover glasses coated with coloured collodion or varnish, and mounted between two pieces of thin cardboard or stout paper in the form of a Waterhouse diaphragm. Now that colour screens are more in vogue, it may be worth while to revive the suggestion.

In selecting glass in this manner, we should, of course, choose that which shows the least displacement of the two images, that is, in which the two images overlap the least; and, if we can find a piece in which there is no overlap at all, we may safely secure that as being fairly accurate. Lastly, in choosing a pair of glasses for tank or cell, or rather in putting them together, care should be taken that they are so placed that the error in one is in the contrary direction to that in the other. The same care, too, should be observed if the screen is composed of two glasses cemented together with a coloured film between, perhaps the most perfect form of screen, if the colouring matter is permanent.

As regards the composition of the coloured screens and solutions we had not intended saying any thing, as there is such a wide choice of materials as well as such diversity in opinions as well as in requirements; we may say, however, that we prefer a properly made collodion film to any other kind, but it must be properly prepared from special pyroxylyne. Colonel Waterhouse, we believe, prefers a shellac or similar varnish, while others give the preference to gelatine; but, in our own experience, neither of the two last can approach in clearness and transparency a collodion film when it is free from structure.

We may conclude by describing a method of making a screen without a glass basis that was recently described to us, and which has proved most efficient in use. It is in the form of the Waterhouse diaphragm, cut out of thin ebonite. A sheet of finely polished plate glass is cleaned, and finished off with powdered talc, and then coated with a thin, structureless and uncoloured collodion; this is allowed to dry, and is then coated with coloured gelatine, previously most carefully clarified. When this coating has become thoroughly dry, the ebonite support or frame already prepared is coated round the edges, but without approaching too near the opening, with a cement composed of thin shellac or Canada balsam, and is then pressed into contact with the gelatine film. An aqueous cement, or even one containing a large proportion of alcohol, would be useless, as, being confined between two impervious surfaces of glass and ebonite respectively, it would never dry. Perhaps Canada balsam liquefied by heat is the best to employ. When the cement is judged to have had time to harden, the point of a sharp penknife is run round the edge of the ebonite frame, which will then easily spring off the glass, carrying with it the tightly stretched film of collodionised gelatine. A film of coloured collodion, without the gelatine, might possibly be used, but it would be difficult to secure the necessary stoutness without introducing some slight amount of "structure."

The First Photographic Use of the Term "Halation."—This word is now of such common employment that it seems difficult to imagine that it is quite of recent application. We note, for example, in the list of words not sufficiently connoted sent out by the editor of that great work, *The New English Dictionary*, the word "halation." The earliest use recorded is in 1881, and the editor wants, if possible, quotations of its use at any earlier date. It is possible some of our readers may be able to assist; if so, they should send the quotation addressed to the Editor, "Dr. Murray, Oxford."

A New Mode of Ridding Water of Germs.—As it is the presence of germs of one kind or another that leads to the decomposition of gelatine solutions, and so tends to induce fading, a new method of treating water so as to destroy the germs may be put on record. Dr. Schumberg, chemist to the German Army Medical Academy, finds this to be efficiently done by adding a solution of bromine; one part of a twenty per cent. solution of bromine in 5000 parts of water sufficed to kill, at any rate, all pathogenic germs. The bromine can be got rid of, if found necessary, by the addition of a small quantity of ammonia.

Röntgen Rays on the Skin.—It seems to be quite proved that the action of the rays has a distinct effect on the skin; this was first pointed out some months ago by the demonstrator at the Royal Institution, but at the time many attributed the evil effects he described to the results of dilute acids left to dry upon the skin. It is therefore now proposed to utilise the rays as a depilatory agent. Public attention to the photographic aspect of the rays seems now to be put aside in favour of their use in medical diagnosis, so that we read of their powers being called into requisition to discover the condition of the lungs in pneumonia and other cases, as also to diagnose rheumatic conditions in the muscles, and so on.

Another Eclipse Expedition Proposed.—It is considered highly probable that there will be a Government Eclipse Expedition to India this year, and that a cruiser will be appointed for this service. It is said, if the project is carried out, that the

expedition will be under the direction of Professor Norman Lockyer. Of course, photography will be one of the principal features of the undertaking. It is to be hoped that, if the project is carried out, the elements will prove more propitious than they did at the time of the eclipse last year, when the results obtained, where the greatest preparations had been made, were practically *nil*. Only those who have taken part in an expedition of this kind, which may have taken months to organize and carry out, can realise to the full the disappointment a few clouds may bring about.

Meteorological Exhibition. — The Royal Meteorological Society had a Special Exhibition, open for a few days only, last week. Its object was to show the meteorological instruments in use in 1837, when the Queen commenced her reign, and those employed now, and there was a fair show of both, particularly the latter. There was also a limited collection of photographs and charts; the latter to show the great advance made in our weather knowledge during the last sixty years. Photographers are always interested in the weather, and outdoor workers almost entirely depend upon it; but we doubt very much if many of them place any great reliance upon the daily forecasts of the weather as issued from the Meteorological Department, when they have work to do far from home. This department costs the country some 15,000*l.* a year, and some think for that sum we should get more correct forecasts than we do, particularly when we remember what an old boatman or a farmer can do in the way of weather forecasting, without any elaborate system, instruments, and almost hourly telegrams from all parts of the country to help him.

An A.R.A. on Process Work.—At the annual dinner of the International Society of Wood-engravers on Friday evening last, Mr. Seymour Lucas, A.R.A., who presided, said he had been told that the art of the wood-engraver was about to die, but it was impossible to find any machinery or any invention that could compete with the hand when directed by an artist. He added that a very long time would elapse before process and photography would kill the great art of the engraver. Every one, we think, will agree with Mr. Lucas that a long time will elapse before photography or process work will kill wood-engraving. But there is no gainsaying that they have very much injured it commercially. It is, however the third and fourth-rate engravers that have suffered so badly, and not the first-class men. Process work will have to be much improved before it can compare with high-class wood-engraving. It must be admitted also that photogravure will have to be materially improved before it can compete with the excellent line engraving or mezzotint of the best old engravers. But the fact remains that both process work and photogravure are flourishing, also that a good photogravure is better than a bad engraving; so is good process work superior to an inferior woodcut.

What will the Kinetoscope be Used for Next?—According to a Reuter's telegram, reporting the recent prize fight between Corbett and Fitzsimmons, it was arranged between the combatants that, if the weather should prove cloudy, the battle should be postponed, the object being to secure a good kinetoscope record of every movement and incident throughout the combat. To this arrangement, it continues, great importance was attached, "as copyright in the production will be secured in the United States, the United Kingdom, France, Germany, Russia, and Canada." On the day of this combat, and at about the same time, a duel was fought in Paris between a Frenchman and an Italian, in which one of the combatants was stated to be wounded in the cheek sufficiently to draw blood. Here, again, we read the kinetoscope was in use; also that several amateur photographers were there with hand cameras, taking snap-shots. In the daily papers an advertising "private detective"—who, when the X rays were so prominently to the fore, advertised he was prepared to utilise the "new photography" in divorce cases—is now advertising "animatography," saying that "he is prepared to carry out this new process of photography in all cases, and to produce the pictures in court in evidence." With all this before us, one may well ask to what purpose this instrument will be put to next, or in what quarter it will turn up next? In the neighbourhood of Crete perhaps?

Photographing Entomological Mounted Subjects.—One of the greatest difficulties met with in this work is the dark colour of the horny tegument, which is insoluble in caustic potash and other media. Isochromatic plates have been found useful in some cases, but often the depth of colour is, even with their aid, so great as to form an effectual bar to photographic work. A writer in the *American Monthly Microscopical Journal* has, however, devised a method of so treating it as to destroy all colour, while, at the same time, preserving the shape of the soft parts of the body. It consists in treating the insect with peroxide of hydrogen solution, and the article in question shows how the whole body of a fly was so treated as to become quite white. The fly was chloroformed, dropped in boiling water, and afterwards spread out on a slide and covered with another, wedged so as to avoid too much pressure, the whole being tied together with thread. It was next passed through alcohols of strengths 30, 40, 50, 70, 80, and 95 per cent., with a day between each soaking. The thread was then removed, and the fly well washed in 95 per cent. spirit, and transferred to spirit of same strength containing ten per cent. of the peroxide solution. In four days the specimen had become as white as chalk. It was then well washed in strong alcohol, and immersed in a $\frac{1}{20}$ per cent. solution of eosine for a day, then rinsed in alcohol, and placed in xylol to clear. The whole body was rendered sufficiently transparent to permit of all the muscles and internal organs being seen. It is evident that many other difficult objects could be treated in a similar manner, and enable photographic reproductions of a most valuable character to be made.

Acetylene.—Though the recent official enactments and insurance objections to the use of this gas and the storage of the needful carbide have virtually prohibited its use, it will be well to note the various new points which arise in connexion with the gas and its employment. We note that Herr Julius Pintsch, in experimenting at his works in Fürstenwalde, finds that, unless ammonia be present, no explosive compound with copper is formed. This does not put out of court the possibilities of explosion with the carbide, though it is likely that this latter is no more dangerous than the manufacture of oxygen gas by non-experts.

There are several points surprisingly lost sight of in most descriptions of the making and storing of the gas. In the first case, it is a fallacy to suppose that, when an apparatus is used for withdrawing the lumps of carbide out of the water, the evolution of gas quickly ceases. On the contrary, it goes on for some time, owing to the water contained in the pasty mass of hydrate of lime formed at the first contact with the water.

Then, again, acetylene is soluble in water to perhaps the same extent as carbonic acid gas. The result of this is that the water in the generator gets charged with acetylene, which eventually is given off from the outer water surface (to where it has diffused), with the effect of rendering its unpleasant odour perceptible all over the room the generator is kept in. It will have been noticed also that the instructions sent with the apparatus do not lay stress upon the great danger that may result from the presence of air in the gas that first issues from the burner. If a light be applied at once, a dangerous explosion might readily occur. Twelve and a half times its bulk of air is the proportion for an explosive mixture far more powerful than the mixture of coal gas and air (which needs a proportion of coal gas twice that of acetylene). If such a proportion happened to exist in the gas issuing from a burner, it would quickly light back and "clear a room" instantly.

More Substantial Damages for Copyright Infringement.—Another instance of how some illustrated papers

ropriate photographs was revealed in the Court of Chancery on ırsday last week. It seems that the plaintiff, Mr. W. T. Smith, s the registered proprietor and author of a picture called *They yed the Last Link with their Lives.* Mr. Smith, being desirous of rking for the *Idler*, sent its art editor a photograph of the picture a specimen, and the defendants, the New Publishing, Co., Ltd., l Messrs. Chatto & Windus, without his consent published a resentation of it in the *Idler*. He therefore sought an in- ıction to restrain the defendants and their agents and servants, hout his consent, from in any other way infringing his copy- ht, and for damages for the infringement. Several defences were sed but they were of no avail, for, in the end, the learned Judge, . Justice Kekewich, said he did not consider the simple sending of photograph to the art editor was an invitation to publish a resentation of it—one of the points for the defence—though the editor honestly thought it was. The question, he said, was one damages, and, in his opinion, the plaintiff was entitled to a ostantial sum for the wrong that had been done to him. He essed the damages at 25*l.*, and ordered delivery up of the books ıtaining the pictures, also the blocks, negatives, &c., the de- ıdants to pay the cost of the action.

One of the things stated for the defence was that it was a usual ıctice to request the proprietors of illustrated papers to publish etches or photographs of their works by sending such sketches or otographs to them or the editors. We know that many otographers have sent photographs to the "illustrateds," trusting, use is made of them, that a fee will be remitted. That is not se. When a photograph is submitted, it should be accompanied a note stating distinctly that, if it is used, the fee will be such or ch a sum. Editors will then have no possible excuse for saying ey were invited to use the picture without payment.

THE BRUCE PHOTOGRAPHIC TELESCOPE.

rofessor E. C. Pickering has forwarded to Europe some of the rlier results obtained with the Bruce Telescope, as illustrations of e work likely to be accomplished by means of this instrument. ese results will be very carefully scrutinised by astronomical otographers, because the history and the construction of the escope are alike remarkable. The Bruce Photographic Telescope the largest that has been constructed purely with the view of ob- ining astronomical negatives. The Lick Telescope, when adapted photography by the additional correcting lens, is possibly more werful, but the primary purpose for which that telescope was de- gned was not photographic. The diameter of the object glass of e Bruce Telescope is 60 cm., and the focal length 343·8 cm., con- quently a millimetre on the exposed plate corresponds to one inute of arc in the sky. The object-glass differs from all other otical arrangements approaching this size, in the fact, that it is a oublet, a form which Professor Pickering has consistently and de- rminedly advocated. So far back as 1883, and possibly before rofessor Pickering had formed a plan of photographing the heavens y means of this optical arrangement, and with a lens of eight inches perture had convinced himself that a very considerable portion of e sky could be photographed on one plate without injurious dis- rtion. He argued that, since it was possible to construct photo- aphic cameras so as to take pictures of buildings, subtending an gle of 60° or even 90°, with proper care and attention, somewhat milar arcs might be photographed on the sky. It was true that the striction of the aperture rendered necessary in order to secure sharp finition limited the amount of light, and therefore prevented such a instrument being applied to the stars on account of the length of posure that would be rendered necessary. Yet usefully large pertures could be found to cover 20°, that is 10° on each side of the ntre line, and with such an instrument he applied himself to obtain ctures of the heavens long before the Paris Astro-photographic ongress had set telescopes to work in all parts of the world, with ıe view of obtaining a correct and uniform picture of the Stellar onstellations. After the eight-inch lens had been at work some time, and he felt himself fortified by the results which he obtained, Professor Pickering, in 1888, boldly asked for a gift of $50,000 to enable him to put his principle to a sufficient test. A wealthy American lady, Miss Catherine W. Bruce, supplied the money at once. From that time to the present, glass-makers and opticians have been actively engaged in producing their best work, and the first specimens of their successful efforts are now distributed.

The proposal to construct an object-glass, or objective doublet, of two feet aperture was much criticised at the time, mainly on two grounds. The astronomers at Paris had but recently elaborated their scheme, involving as it did the participation of some seventeen observatories of various nationalities, and the integrity of the scheme was thought by some to be jeopardised by the challenge which Professor Pickering had practically thrown down, since he undertook, or at least suggested, that the work might be done by his own staff, without making necessary the co-operation of so many observatories. Then, too, the objective doublet was altogether an unknown force, whose results had not been adequately submitted to competent judgment. To multiply an instrument by three is a fairly easy task on paper, but one that often proves impossible in the workshop, and it was felt that to predict the performance of such an instrument was premature, and might be misleading. On the other hand, the photographic object-glasses that the Paris Congress proposed to use had been sufficiently tested, and their capabilities were well known. The process that it was agreed to follow might be slow, but was pretty sure to be successful, whereas Professor Pickering's rival scheme, if any rivalry really existed, could not be supported by any practical results.

This is all ancient history now, but it will be very interesting to compare, what may be called the intuitions of Professor Pickering with the experience of the French astronomers and those who have followed their lead. From the moment that the dry plate came to be successfully employed, and the length of exposure was consequently only limited by the patience of the observer, there could be no doubt but that a photographic map of the heavens would be undertaken, though the difficulties in the selection of the most appropriate optical arrangement might be considerable. The main difficulty was the character of the stellar image at a considerable distance from the optical axis of the instrument, and this was a matter which had not come practically before the optician, and one on which he had not experimented. In the early days of stellar photography, the question was not so much what form of objective gave the best image, as whether the reflector, or refractor, was the instrument better adapted to the end in view. As we all know now, the choice fell on the refractor, and probably wisely, because although the reflector is the simpler optical instrument, and rays of all refrangibilities are brought to a focus at one and the same point, yet it is impossible for the optician to improve the field of the reflector. Its excellencies and its capacities are alike known. But the refractor offers a wide field for experiment, and it was hoped, and to some extent successfully demonstrated, that without destroying the good definition of the central pencil a much better and flatter field could be obtained at a remote distance from the axis than is the case in the reflector. The possibilities of the refractor being once recognised, it was perhaps natural and imperative that opticians should experiment along lines with which they were familiar, and the improvement of the ordinary form of achromatic lens, with its combination of flint and crown glass, was the problem in which they were interested. It had oftentimes been difficult enough to get one pair of glass discs of considerable size optically perfect, and, though the additional expense of procuring a second pair might have been cheerfully borne, yet the traditions of the workshop pointed to other methods of accomplishing the same end. It was, therefore, to the modification of the curves of the surfaces, to the distance between the lenses, and to questions of that kind that experiment was directed, and, considering the novelty of the subject and the eagerness of purchasers to possess their instruments, with a fair measure of success. The difficulty of the task was aggravated by the fact that the experience of the eye gained in local working on an ordinary visual objective was of little use here. The minimum focus of the final optical combination had to be in that portion of the spectrum which operates most actively on

the sensitised plate, and it was necessary to get the focus of the object-glass for various parts of the spectrum far away from the part that is best and most easily seen. Two or three opticians solved the problem, more or less, it may be presumed, on the same lines, for in the extent of available field and in the character of the image at the borders of that field there is great similarity, whether the object-glass left the workshop of Sir Howard Grubb or that of the Brothers Henry, or any other optician.

All this was accomplished some years ago, and now Professor Pickering offers another solution of the same problem, in which he contends that his predictions have been amply fulfilled. But it must be admitted that all the participating observatories have long been supplied with their telescopes, and have accomplished much of their work. It might therefore be urged that simplicity and rapidity of execution seem to have been on the side of those who pursued the lines proposed in the Paris Congress. The money for the Bruce Telescope was supplied in 1888, and the instrument has got to work in 1896. Of course it is a much larger instrument than the Paris type, and the difficulty of procuring the glass in the first place, and of figuring it afterwards, is proportionately greater. The two discs for the flint lenses were delivered in America in 1891. An accident to one of the discs of crown glass delayed its arrival somewhat, but, nevertheless, since the final payment was made to Messrs. Alvan Clark in the spring of 1895, these eminent and experienced opticians were engaged some three or four years before they satisfied themselves and the astronomical authorities of Harvard, that all had been done that was possible in perfecting the optical arrangement. The task of constructing an objective doublet does not seem to have been slight, and, judged simply by the expenditure of time alone, the selection of the Paris type now in use appears to have been amply justified.

The more important question of the extent of available field has yet to be considered. On this question of field depends the amount of time required to make a complete survey of the heavens. If an instrument gives equally good definition over three degrees square, that is nine square degrees, while another is trustworthy over only four square degrees, evidently the first telescope could complete a survey in less than half the time of the second, and the greater amount of capital expended in producing the more perfect instrument is a judicious outlay. How far the field is trustworthy in the Bruce Telescope it would be premature to express an opinion. We are not in possession of the original negative. We have a photo engraving of a very considerable area taken on a plate 14×17 inches. The size of the plates for the International Photographic Chart is about six inches square. Since the focal length of the two telescopes is the same, it is easy to compare the areas that it is proposed to photograph on the two systems. But Professor Pickering admits that the form of photo engraving, now published, while convenient to give a general idea of the appearance of the general negative, is not adapted to a careful study of the plate. The images are formed of black dots upon a white background, and accordingly it is impossible to derive from them the true relative positions or magnitudes of the stars represented, "Photogravures have accordingly been prepared of two regions, produced by contact printing from the original negatives, and cover a region five degrees square." All the regions have a considerable southern declination, and there are no means at hand to compare the results with other photographic work of similar exposure.

Professor Pickering has mounted the instrument at the Arequipa station, which may be regarded as a permanent extension of the Harvard College Observatory. It has been placed under the charge of Professor Bailey, whose energy and capacity have been amply proved by the vast amount of photometric work he accomplished in South America a short time since. Of scarcely less importance than the construction of the instrument is the choice of the observer into whose hands it is intrusted, and Professor Pickering is to be congratulated in possessing an assistant so competent and energetic. In the choice of a station, Professor Pickering is no doubt just as well advised. Not only does the South American station afford greater opportunities of observing, owing to the clearness of the atmosphere and the absence of cloud, but it is far removed from the glare of electric lights and the tremor occasioned by the passing heavy vehicles, inseparable from the neighbourhood of a large ci The instrument will be tried under exceptional circumstances, a cannot but collect a vast amount of valuable information, which administrative capacity of Professor Pickering will know how to to the utmost. We may congratulate him both upon the success construction of an instrument which is designed upon a plan that has uniformly advocated, and the generosity of the donor who had confidence in his power to carry the experiment to a success issue.

W. E. PLUMMER.

AMERICAN NOTES AND NEWS.

Revival of Stereoscopy in America.—The Editor the *Photo-American* notices a marked revival of interest in a bran of photography which has lost ground considerably during the la eight years, that is, stereoscopic pictures. For some reason, stere scopic pictures, once so common in every household, dropped entire out of sight suddenly, he remarks, and became as scarce as they we once common. The beauty of these pictures, however, could n remain smothered for ever, and once more, after a long rest, they a frequently seen. Amateurs are going in for them quite extensivel using a 5×7 hand camera with front board arranged for both sing and stereoscopic pictures. Dealers are rummaging in their stoc rooms, way over in the corner devoted to Daguerreotype plates an plush cases, wet-plate baths and cobwebs, to find their stock stereoscopes, which are now selling fairly well, there being no notab improvement on the old styles of both hand and table instruments.

Testing a Lens for Astigmatism.—Mr. Ernest Gund lach, the well-known American optician, recommends, in the *St. Lou and Canadian Photographer*, that to test a lens for astigmatism th photographer should take a piece of cardboard about ten inche square, cut with a sharp knife across in the centre of it, the lines o slits parallel with the edges of the sheet and about four inches lon and one-eighth or three-sixteenths of an inch wide. Fasten th sheet in an upper corner of a window which is so situated that th cross can be looked at from a point or place as far away as possible say thirty to fifty feet, and with the sky behind the sheet so that th cross appears white upon dark ground. Now put your camera wit the lens on at this place, and focus the cross in the centre of th ground glass, the lens being at full opening. Focus accurately, and then turn the camera until the image of the cross has reached the side margin of the ground glass. Here the cross will appear as sharp as in the centre, without refocussing, if the lens is perfectly anastigmatic and the spherical and chromatic aberrations, as well, corrected in this oblique direction as in the centre or optical axis. But, alas! where is the lens that will stand this severe test? If the lens is an ordinary rectilinear, or symmetrical only, the vertical line of the cross will appear fairly sharp, while the horizontal line is much blurred. This is because the focus of this (horizontal) line is *too short;* the lens is *astigmatic. The difference of the focal lengths of the vertical and the horizontal lines of the cross at a given angle of field and given equivalent focus amounts to the astigmatic aberration of the lens.* The requirement of a modern anastigmat is not only freedom from astigmatism, but a flat field at the same time; that is, the foci of the two lines of the cross must not only coincide but also be in the plane of the central or axial focus. For this the test with the cross should be made on both sides of the ground glass; or, better, the image should move slowly along the plate from one side to the other. Should the image appear less sharp at any point between centre and edge, the defect is due to secondary field curvature.

The Mounting of Photographs.—This, as Mr. Xanthus Smith in the *Canadian Photographic Journal* points out, is to a considerable extent a matter of taste; for what strikes one person as agreeable and appropriate may not be in harmony with the ideas and feelings of another. But there are a few broad principles governing the matter which should be understood, and cannot be departed from without offending the general run of persons of good taste. With regard to size, as a rule, however inconvenient or expensive it may be, the more margin we allow surrounding the print the more appearance of importance and value the work will have. With regard to colour, while it occasionally happens that a white mount is the best of all, it will more often be found that a tint below the high lights of the print will be preferable, because by

ving second to the print in this respect it will give it more im-tance. Delicate shades of grey invariably show photographic its to advantage, but great care and a refined judgment of monics are required to accommodate precisely the tone of the unt to that of the print. It is a mistake to suppose that the unt should contrast the print strongly. When attempted, it will nerally be found that they war with each other; as, for instance, en we place a sepia print upon a slaty or blue-grey mount. The unt should support and echo the prevailing tone of the print. A rmer print requires a much warmer-toned mount than a cold ck-and-white print. Think of a black-and-white print upon a ra-cotta mount, and yet we have seen such. Be it remembered, ough, that sometimes slight contrast is necessary in order to avoid neness. In order to give spirit or attractiveness to the whole, mode at present much adopted, of having a narrow border of ite immediately surrounding the print, is excellent. Cool prints on stone grey mounts with this slight interposition of white have ery attractive effect; but, when the amount of white border is reased, the effect is not so good, as the mount immediately comes too conspicuous, and begins to war with the print. Borders matts with exaggeratedly rough surfaces are not in good taste; ey may attract for a moment as a novelty, but will not hold a ting place in the estimation of persons of good judgment.

American Schools of Photography.—According to the *nerican Amateur*, photography is gradually being introduced into e curriculum of many of the schools of the country. Our con-nporary is of opinion that it is now so widely employed in the arts d sciences as to give it a claim to be considered an essential part of neral education. From a circular it has received, it appears that he Riverside School,' under the auspices of Little Rock University, k., has this year included a School of Photography, under the arge of Prof. J. D. Barnett, a well-known photographer and ghly esteemed resident of that locality.

Photographer or Artist?—"There is something straight, nest, and to the point in 'John Dick, Photographer,' that one es not quite feel about 'James Ross, Artist Photographer,' or eorge Brown, Photographic Artist,' and especially when John or eorge, as they very often do, contract the adjective to 'Photo.' ofessional photographers," says the *American Amateur Photo-apher*, "may be artists; some of them are; but it is much more fficult for them so to be than it is for their amateur brethren. ie professional photographer of to-day, whatever he of the future ay be, is the servant of his *clientèle*, and, so long as they are tisfied with a simple likeness, and insist on as perfect definition in ckgrounds and accessories as on the facial *contour*, he will supply and small blame to him."

Natural Plants in Studios.—Mr. H. W. Hales, in the *rofessional Photographer*, gives a few useful hints on this subject. There is probably nothing that adds more to the artistic appearance the gallery or studio, or that produces a better effect on atrons by exhibiting good taste," he says, "than a few hand-me or strikingly formed natural plants. These lend a graceful id pleasing appearance to the gallery that at once attracts the tention of visitors, and often results in their giving an order where herwise they might hesitate. Among plants that are particularly lapted to this purpose is the palm family. One of the best palms r bold, striking effects is the *Latania Bourbonica*. This is the ell-known fan-leaved palm, and it is a fine plant for decorating the udio, although, for introducing into portraits, it is rather massive. nother good palm is *Areca lutescens*. This is a very graceful and ther tall-growing variety, and can be used in many ways, either r decorating the studio or in practical portrait work. Many of the umerous family of *Kentias* are also very useful, and they are very od, sturdy plants, as well as graceful in form. The well-known ocos *Weddelliana* is a little gem in its way, its light, feathery ppearance giving it the look of a graceful fern, and harmonising ell with artistic, graceful surroundings. For more bold and riking effects, the well-known family of *Dracenas*, or dragon-ees, are frequently very useful, but the red-leaved varieties must e used with care under the skylight, as, in a photograph or finished rint, they come out very dark. When using orthochromatic plates, owever, their colour values are much better rendered.

Photographing Interiors.—In the *Photographic Times* Ir. H. C. Delery has a very good article on architectural photography. Referring to interiors, he says: Of course, it is almost essential that they be taken with a wide-angle lens, and for this reason should we exercise the greatest care. First, allow the rooms to retain their every-day appearance; do not attempt to make up "as an actor" does for the stage. Of course, certain changes are necessary to suit the circumstances. Be careful not to place statuary, chairs, and furniture, in the immediate foreground, as they would be unduly magnified and cause a very unpleasant effect. Select a point of sight which affords the prettiest view, and avoid as much as possible placing the camera directly opposite windows and suchlike; a side light, or one coming from over either the right or left shoulder gives the best effect; but, as is often the case, should there be openings which would throw an objectionable light, such as stand in front of the lens, cover these openings with some dark material from the outside, and after the exposure is made for the interior remove these coverings, and then make a short exposure such as would suit an out-of-door view. In order to harmonise the light, dark objects should be placed where they can receive the strongest light, and bright ones made to relieve dark corners.

THE USE OF COLOURED SCREENS.

In the current number of the *Bulletin de la Société Française*, M. Leon Vidal points out that this question is by no means so well understood as it should be. All orthochromatic plates are more sensitive to blue than the other colours, and therefore a plate which has been sensitised for yellow still gives greater opacity in those parts affected by blue; and to obviate this defect it is usual to use a yellow screen, not to absorb the whole of the blue, but merely to dampen this down, so that the yellow shall give greater density than the blue; and according to the saturation of the blue we must use a yellow screen more or less intense.

As a general rule for commercial orthochromatic plates, a screen made with aurantia should not be darker than to require four times the exposure for the same subject with an ordinary plate. For a red and yellow sensitive plate the same screen will be found the best to use.

M. Vidal lays special stress on the fact that increase of exposure cannot give an orthochromatic effect; but, with very sensitive plates, it is true that a certain equality in density is obtained for all the colours, but this is from the white light reflected from the surfaces of coloured objects. With excessive exposure the blue is rendered as grey, whilst the yellow and green may attain the desired intensity by the increase of exposure; but orange, red, and vermilion only act very feebly on the sensitive plate.

When we come to the question of three-colour printing, the screens must be chosen for plates sensitised in a particular way. And the colours which are to be picked out are: 1, blue and its combinations with the other colours, which must be the object of one negative; 2, the yellow and green and their combinations, for another negative; 3, red and its combinations, a third negative.

Supposing we take as a simple example a subject formed of bands of various colours—carmine, violet, blue, green, yellow, red-orange, and red. These bands or strips bring in two degrees of saturation, one faint and the other rich in colour.

To extract the blues, we ought evidently to use a plate sensitive to blue, and this is not difficult to obtain, as all ordinary plates possess a sensitiveness to blue greater than to any other colour.

We ought, at the same time, to use a screen which will absorb all the other colours but blue. Certain workers recommend a violet screen, based on the fact that in the spectroscope violet shows a powerful absorption for yellow, and yet allows the whole of the blue to pass. Unfortunately, however, what applies to the spectroscopic examination does not apply to the action on the sensitive plate; all the yellow rays are energetically absorbed by the eye, but they do not act on the plate. The use of a violet screen, then, is purely theoretical, and, moreover, useless, except where it may be considered desirable to reduce the sensitiveness of the plate, or rather to increase the exposure. An ordinary slow plate should be correctly exposed to give the impression of the blue.

In photographing the above strips of colours, we shall find the carmine, blue, and violet have impressed the plate with about the same intensity; that the pale yellow has acted less, and the green, yellow, and orange have produced no action in the saturated part, and that the pure red has not acted at all in either case.

Passing on to the second negative, that for the yellow, it is evident we must use a plate sensitive to yellow, and we have here the choice of two screens, a yellow or a green. The yellow screen produces the following effect: The strip corresponding to the yellow is more intense than all the others, the blues have their relative values, the dark green has hardly

acted, the faint red has produced a feeble action, the dark red has not acted at all.

If one wishes to suppress the action of the red, and to obtain a better rendering of the green, it is advantageous to use a green screen. The result is less action in the carmine, none in the pure red, and the yellow is still stronger than all the others; the action in the green is sensibly stronger. The green screen cuts out the whole of the red of the spectrum, part of the blue in the region of the violet, and allows to pass the whole of the yellow and green. The yellow screen absorbs the blue and violet partially, and allows all the rest to pass; there is no trouble, however, with the pure red, which does not act on a plate not sensitised for the same.

We now come to the third and last operation, the taking of the yellow and red, and for this it is essential to use a plate sensitive to red and yellow. The screen used should cut out the whole of the blue; it ought to be a ruby-red, and be chosen spectroscopically, and the whole of the spectrum should be absorbed except the red and yellow. The blue should be absorbed, so that the red and yellow may act on the plate. An examination of the scale will show that the green, blue, and violet have not acted, whilst the carmine-yellow, red-orange, and red have given strips of great density. The red screen increases the duration of exposure from eight to twelve times.

Thus the selection of the three essential colours will be good if one uses—

1. An ordinary plate, without screen, for blue.
2. An isochromatic plate, sensitive to yellow, for yellow and green.
3. An isochromatic plate, sensitive to red, for yellow and red.

Now find the screens to be used for the synthesis of the colours of the original by means of the three negatives obtained by the aid of three-coloured lights. Experience with the chromoscope shows that the positive from the blue negative should be illuminated with a sky-blue screen. The statement that a violet screen should be used is, M. Vidal states, erroneous.

The positive corresponding to the yellow and green negative should be illuminated by a yellow screen; and, finally, the red positive with a reddish-orange screen.

If the triad, violet, green, and red, suggested by Young, Helmholtz, and Captain Abney, &c., be used, pure white and blue will never be used.

M. Ducos du Hauron, indeed, speaks of a violet screen, but he uses the word ultramarine in parenthesis. It may be that the theoretical mixture of two extreme parts of the spectrum and one of the middle of the spectrum produces a complementary series.

From a very large number of trial mixtures of coloured lights Vidal comes to the conclusion that pure white and the most brilliant yellow are obtained by the three colours, sky-blue, red-orange, and yellow-green.

If the red and the green are mixed by projection, one obtains a beautiful yellow. If this yellow is mixed with blue, a pure white is obtained. If the blue disc is replaced by violet, the result is totally different, being a whitish-violet, and, on the other hand, blue is never attained in those parts where it is wanted.

If the violet screen is not wanted for three-colour projection, still less should it be used for three-colour printing.

The place for the screens may vary according to the apparatus. When it is possible, it is preferable to place them in a frame held some millimetres in front of the plate. For occasional use they may be placed before the lens, but, in the case of three-colour printing, the focus may be modified, and the position in front of the plate is the more convenient.

With regard to the above article, I would add that, with the present existing commercial plates, the use of the green screen is certainly to be preferred to the yellow, for, notwithstanding their sensitiveness to yellow, they always show a minimum of sensitising action in the green. M. Vidal's statement that the green screen absorbs the whole of the red is not quite accurate so far as my experience goes, for I have not yet found any green dye or glass which does not allow a narrow band of red in the neighbourhood of A in the spectrum to pass; but this is of little consequence, as no plates are sensitive at this point.

Ducos du Hauron, in his new work *La Triplice Photographique des Couleurs* suggests for the yellow screen a mixture of—

Picric acid	0·60 gramme.
Gelatine	7·0 grammes.
Glycerine	0·5 gramme.
Distilled water	50·0 c. c.

the above quantity to be coated on a plate 18 × 24 cm., or 432 sq. c.

M. Vidal's statement as to the colour of the screens for projection is, according to my experience, correct, for, with a red, green, and violet, as has hitherto been used, I have never been able to make a pure white, nor have I seen one made, the excuse generally being that the light varies.

With regard to the position of the screen, the best place is undoubtedly in front of the light, so that the object is illuminated by coloured light; for, supposing we take strips of red, yellow, and blue, and illuminate them by white light, it is a well-known fact that they will reflect a considerable quantity of white light, and that a deeper screen must be used when near the lens to absorb this white light; whereas, if we illuminate the strips, let us say, with orange-red light, it is obvious that the blue cannot reflect any white light, for none reaches it, and this is also the case when using a green screen or a violet, when the red and yellow cannot obviously reflect light which does not fall upon them.

With regard to the use of the violet screen, I should like to point out that, theoretically, in three-colour printing the perfect negative for the printing surface in yellow should, if we were reproducing the spectrum, allow the blue, violet, and red to act in equal value, and show less action in the orange, none in the yellow, and a rising intensity in the green; and this can only be obtained by using a violet screen. If a violet screen is not used, and merely a slow ordinary plate, it is obvious that we shall get no action in the red, no action in the yellow, and but little in the green; consequently our printing surface would give yellow in these parts, and in the case of pure red this would obviously be wrong. It has, however, been pointed out by M. Vidal that rarely do we in nature get a pure red; and this difficulty may be got over by using a carmine ink, the addition of yellow to which will render satisfactorily most of the natural reds.

A. D. Pretzl.

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

A Meeting in Yorkshire.

In accordance with a resolution passed at the last meeting of the Affiliation Committee, an invitation was issued to the secretaries and delegates of affiliated societies in the north of England to meet on Thursday, March 18, at the Grand Restaurant, Boar-lane, Leeds. The invitation was so far replied to that representatives were present from the following societies:—Ashton-under-Lyne Photographic Society, Beverley Photographic and Sketching Society, Bradford Photographic Society, Brighouse Photographic Society, Cleckheaton Photographic Society, Hull Photographic Society, Leeds Camera Club, Leeds Photographic Society, Rotherham Photographic Society, Sheffield Photographic Society, and Wakefield Photographic Society.

Mr. W. Thomas took the chair, and, in opening the proceedings, said that the meeting had been called in order to decide upon the lines upon which the societies in that part of England would be best able to help one another. He emphasised the fact that the Affiliation was a matter of which the societies had the future in their own hands, that the success of the movement was the societies' success, and its failure would be equally laid at their door. He recapitulated the work which had been already done, referring to the circulating lectures which had been sent round, and to the pictures which were now in course of preparation for circulation.

Mr. Child Bayley (Secretary) read a list of the suggestions which had been received, pointing out which of them the Committee had already endeavoured to carry out.

A general discussion then took place on the various suggestions received.

Lectures, &c.

Mr. J. V. Saunders (Hull) said that, as far as his Society was concerned, the Affiliation had been of considerable use to them. They had had a great many of the lectures, &c., which had met, on the whole, with general approval. Some of the members thought one or two of the lectures too heavy, but he thought at least they were instructive if not entertaining.

Mr. W. T. Wilkinson (Wakefield) said that in Wakefield they had been very pleased with the work of the Affiliation. He expressed a strong hope that, when the collection of pictures was circulated, the Committee would arrange a tour for it, with a view to minimising the cost of carriage to each society. He suggested that all sets of lantern slides for circulation should be subjected to a rigid selection before being sent out, and that an endeavour should be made to make the Affiliation ticket a pass available as far as possible for photographing in parks, &c., without further permission.

Mr. A. W. Stanfield (Wakefield) hoped that, when the present series of lectures had done circulating, they would be available on loan for the purpose of being read over by members of any society who might wish to do so.

Mr. J. H. Georgeson (Brighouse) thought that, if two meetings per annum could be held of the delegates (one the summer meeting, under circumstances when outdoor photography might also be carried on), it would be sufficient. He hoped that the Committee would see that the papers were kept as bright as possible.

Mr. H. C. Hemmingway (Rotherham) suggested the addition of an illustrated lecture on photographic survey work, which his Society had just taken up. He also thought that it would be a fairer arrangement if the smaller societies could pay a minimum annual subscription of, say, one guinea, the larger societies paying more in proportion.

Mr. Henry Mann (Beverley) said that the lectures which they had had at Beverley were regarded by the working members as both interesting and instructive.

Mr. W. R. Irwin (Leeds Camera Club) said his Society had had two of the lectures, and were very highly pleased with them. He wished to emphasise the remarks of Mr. Wilkinson, that a tour should be arranged for the collection of pictures that were going to be circulated, so as to cut down the cost. He supported the idea of increasing the value of the Affiliation membership tickets, and suggested that an effort should be made to get them adopted as permission to photograph in the London parks.

Mr. Warburton (Leeds) remarked that the Leeds Photographic Society had had two papers from the Affiliation some years ago, but they were of such a bad nature that they never asked for any more.

The Chairman pointed out that the papers to which Mr. Warburton was referring were not those which the meeting had under discussion, but were two which had been read before the Royal Photographic Society, and had been kindly placed at the disposal of the societies at the initiation of the scheme to make a start.

The discussion was continued by Mr. Ellis (Sheffield), Mr. Hemmingway, Mr. Georgeson, and Mr. Vevers (Leeds Camera Club), the last-named dealing with the suggestion that cheap fares for photogrephers should be strived after.

The Secretary, having pointed out the steps that had been already taken in this direction, and stated that they held out no hope that this object would ever be achieved, the suggestion was passed over.

Circulating Library.

The consideration of the idea of forming a travelling, or circulating, library was next proceeded with, Mr. Georgeson proposing that the idea should be passed over. Several speakers having referred to the fact, that most of the books likely to be of general use could be purchased for a few pounds; also, that if societies wanted a useful library, they should have little difficulty in forming one for themselves,

Mr. Saunders inquired if it was possible that an arrangement could be made with the Royal Photographic Society, by which books could be borrowed from their library; but it was pointed out that they were not allowed out even to members. The subject thereupon dropped.

Local Exhibitions.

A long discussion took place upon the feasibility of holding a local exhibition by the affiliated societies upon the circulation of the loan collection of pictures, and it was finally resolved, with reference to the latter, on the proposition of Mr. Tomlinson (Sheffield), seconded by Dr. Hamilton (Ashton-under-Lyne), that the Council of the Royal Photographic Society be asked to lend a selection of the pictures in their permanent collection for circulation amongst the affiliated societies.

With reference to the local Exhibition, it was proposed by Mr. Georgeson, seconded by Mr. Vevers, that an annual exhibition of pictures by members of affiliated societies, to be held at a place to be determined upon at a meeting of the secretaries and delegates is desirable.

Mr. Hemmingway moved, as an amendment, to omit the word "annual." The amendment being seconded by Dr. Baldwin (Rotherham), was carried, and the original proposition thus amended was carried unanimously.

Creation of Districts.

Mr. Wilkinson proposed, Mr. Irwin seconded, and it was, after discussion, carried unanimously, that the Affiliated Committee be asked to map out the affiliated societies into districts, and that a meeting of the secretaries and delegates of societies in any one district be called in that district, on the requisition to the Secretary, signed by the secretaries of any three affiliated societies in the district, and stating where the meeting is to be held.

It having been pointed out that the Affiliation Committee in so doing could only act effectively if the societies most concerned indicated what they considered their district ought to include,

Mr. Georgeson moved, Mr. Warburton seconded, and it was carried, that Yorkshire be a district, and that the first meeting be held in Bradford.

Board of Judges.

It was agreed, after discussion, that the Affiliation Committee be asked to take into consideration the formation of a Board or Committee of Judges, to consist of not less than three, to whom competitions would be submitted for adjudication. The discussion then turned on the question of the advisability of the larger societies paying a larger subscription than at present, but the proposition was subsequently withdrawn.

Restrictions as to Photographing.

Mr. Irwin proposed, Dr. Baldwin seconded, and it was carried, that, when restrictions as to photographing in any particular place have been pointed out by the local society, the Affiliation Committee be asked to endeavour to secure the remission of such restrictions to members of affiliated societies.

The meeting closed with a vote of thanks to the Chairman and the Secretary.

CAPTAIN ABNEY AT THE CRYSTAL PALACE.

In connexion with the celebration of the sixtieth year of the Queen's reign, the Crystal Palace authorities have organized a series of Wednesday evening lectures by recognised authorities, on the progress made in the various arts and sciences since the year 1837.

On March 17, Captain Abney delivered a lecture under the scheme, upon *Photography and its Applications*. The lecture was delivered in the theatre, and on the occasion in question a very large audience was present; the arrangements of the building, however, were such that every one present was able both to hear the lecture and to see the numerous experiments by which it was illustrated.

Captain Abney commenced by sketching the history of photography, pointing out that, lying as it does almost entirely between 1837 and 1897, it was peculiarly a subject for one of such a series of lectures. Touching lightly upon Talbotype and Daguerreotype, he discussed the wet plate at greater length, coating, exposing, and developing a wet plate upon the stage. Collodion emulsion, as the next important advance in negative-making, he alluded to, and then dealt with the modern dry plate. A chloride plate was developed in the lantern, the gradual growth of the image being intently watched by the audience and greeted with a round of applause. A spectrum was next exhibited, and a sheet of bromide paper having been exposed in it was developed *in situ*, and, the spectrum being again thrown on the developed print, attention was called to the insensitiveness of the gelatine emulsion to the red end of the spectrum.

Printing processes were next dealt with, and the development of a platinotype print with a brush was demonstrated. After allusion to the carbon process and its allies—Woodburytype, collotype, and photogravure—Captain Abney proceeded to give a short description of the principles underlying photography in colours in the three-colour method. Three slides in the three separate colours employed by Mr. Ives were projected on the screen, followed by one in which the three previously mentioned were superimposed. Further slides by Mr. Ives and by Professor Joly were exhibited, and were well received. Mr. Bennetto then exhibited on the screen a number of very beautiful specimens of colour photographs obtained by a process, Captain Abney observed, not yet made public, but the results of which the audience could judge for themselves. Prolonged applause greeted the projection of some landscapes, seascapes, &c., by Mr. Bennetto, the last slide to be shown, one of a sunrise over the sea, receiving a particular share of admiration.

The lecturer concluded by exhibiting on the screen a large number of slides illustrating some of the many applications of photography. These included photographs of the sun, of sun spots, the moon, comets, nebulæ, the planets, lightning photographs, stellar and other spectra, meteorological records, flying bullets, falling drops of water, tele-photographs of wild birds, composite photographs, photographs of torpedo explosions, photographs of mines taken by flashlight, and a number of photo-micrographs of bacteria, &c. Lastly, Captain Abney said, no account of the progress of photography would be complete without some reference to the "new photography," as it was called, the credit for which is due to Professor Röntgen, and a portrait of that gentleman, followed by a number of X-ray photographs, brought the long series of examples to a close.

"ARTISTS."

Mr. Seymour Lucas, A.R.A., presided at the Fourth Annual Dinner of the Society of Wood-engravers, held on Friday, March 19, at the Holborn Restaurant, and, in proposing the toast of the evening, said he had heard for a long time that the art of wood-engraving was about to die, that it would be killed by "process," and that, unless wood-engravers turned photographers, there was nothing left for them but the workhouse. Personally he did not believe such a dismal story, for it was quite impossible to find any machinery or any invention that could compete with the hand when directed by an artist. Photography might wipe out bad engravers, but artists who put their soul into the work were bound to live.

Mr. Marcus Stone, R.A., replying for "Art and Literature," said that painters had a curious and silly proprietorship to the word artist, although they themselves had not taken it. He thought they always spoke of themselves as painters, but the title was given them by the world in a pretty, pretty fond way. The world did not like honest words; it preferred the pretty pretty. There were artists in the music-hall, artists on the tight rope, and artists in hair, all of them, doubtless, worthy people; but in the closer and more actual sense of the word he loved to feel that there was a sacred wall surrounding literature, music, and the graphic arts. The art of wood-engraving was beautiful, and was hallowed by antiquity. It was not going to be killed, it was only passing through a trial that required patience. Science was making great advances, but science had not yet discovered the means by which

artists could live on air. If such a discovery had been made, they would all be happy, for nine-tenths of the genuine artist was a man of conscience; the other tenth was a breadwinner.

THE STORAGE OF CALCIUM CARBIDE AND ACETYLENE.

The following is the memorandum relating to the storage of calcium carbide and acetylene which has been issued by Colonel Sir Vivian Majendie, H.M. Inspector of Explosives, under date of March 1:—

With a view to assisting local authorities in dealing with applications for licences to keep carbide of calcium, the following observations as to the character and prevention of the risks attaching to such keeping have been drawn up:—Carbide of calcium is a solid substance, which, while not itself inflammable, evolves, when brought into contact with moisture, a gas (acetylene) which is of a highly inflammable character. This gas, when mixed with air, or when under even slight compression, becomes powerfully explosive. Carbide of calcium, unless carefully manufactured from suitable materials, is liable to contain impurities which, when the carbide is acted on by water, evolve phosphuretted or siliciuretted hydrogen, gases which, when evolved in appreciable quantities, would render the acetylene produced liable to spontaneous ignition. In addition to the risks indicated above, acetylene gas is capable of forming an explosive compound when brought into contact with copper. The character of the apparatus to be used in connexion with the production of acetylene gas from carbide of calcium is intimately connected with the question of safety; for example, grave risk may arise from the heat developed by a too rapid conversion of the carbide into acetylene gas, or from the apparatus permitting escape or leakage of gas which is being formed, or not allowing a free passage of the gas from the generator into the holder, and so causing excess of pressure in the generator or other part of the apparatus. Risk might also arise if proper provision were not made for dealing with the residue of the carbide of calcium which has been used for making acetylene gas (viz., lime), as such residue might contain carbide of calcium which has escaped decomposition.

It will, therefore, be obvious that local authorities, in granting licences for carbide of calcium, should have regard to the foregoing risks, and with that view should make provision:—(*a*) For the exclusive use of hermetically closed packages for the keeping and conveying of carbide of calcium; (*b*) the adequate ventilation of the place where the carbide of calcium is present; (*c*) the prohibition of any powerful compression of the gas produced in the apparatus or receptacles employed; (*d*) the keeping and use of pure carbide of calcium only, and the establishment of efficient arrangements for the sampling and testing of the carbide; (*e*) the exclusion of copper from all vessels or apparatus used with or for carbide of calcium, and the gas produced therefrom; (*f*) the use only of any apparatus which the local authority have satisfied themselves, under competent advice, is of a safe and suitable character, and the prohibition of the employment for the manipulation of such apparatus of any person other than a properly instructed and capable operator; (*g*) the safe disposal of the residue and the prohibition of its introduction into sewers, cesspools, &c., unless mixed with at least ten times its bulk of water.

It will, in all cases, be for the local authority very carefully to determine whether the premises proposed to be licensed are themselves suitable for the purpose, regard being had to the formidable consequences (from fire or explosion) which might result from the careless or imperfect observance of any of the imposed conditions, especially in dwellings, or in places or premises where large numbers of persons are liable to assemble.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Encaustic Paste.—Diligent asks: "Will encaustic paste improve the permanence of P.O.P. prints? Is it an easy job to make it by the formula in the Almanac, or can it be bought ready-made?"

Defective Lens.—J. Berry says: "I have a portrait lens, the front or cemented combination of which shows markings as if the cement was giving way or losing its hold. Could it be recemented? if so, can I safely do it myself? and, if so, again, how?"—Better send it to an optician.

Albumen Paper.—W. H. P. says in reply to John P.: "If he will turn up the edges of the paper so as to form a sort of dish, the silver solution can be poured in and left for the requisite time, and then poured back to its bottle, the paper being laid on a sheet of glass. A stock bottle of an ounce or two will then suffice."

Purifying French Chalk (?).—In reply to S. S. C. (p. 170), I have been in the habit of using French chalk for plate-polishing purposes for perhaps five-and-twenty years, but I was never fortunate enough to meet with a soluble sample. If I were S. S. C., I should reserve the sample he has got for adding to his toning bath, or, if he is a wet-plate worker or silver printer, for correcting the silver bath, or indeed for almost any other purpose but plate-polishing; mixed with ammonia instead of nitric acid, I should say it would do very well for *cleaning* plates, not *polishing*. For that purpose I should advise him, especially when he next tries the purifying process, to get some of the common insoluble kind, which is also sold as "glove powder." But perhaps the chemist gave him "prepared chalk," not knowing the difference—or not caring.—W. B. Bolton.

Sensitising Albumen Paper.—If your correspondent, John P., wishes to economise silver solution in sensitising his albumen paper, let him try the contrivance known as a Buckle's brush. This consists of a tuft of cotton-wool drawn into a glass tube by means of a loop of string, and used as a sort of mop to apply the solution with. For the purpose in question I should select a tube of rather wide diameter, say, three-eighths to half an inch, and a lump of cotton sufficient to leave a mop the size of half a walnut when firmly drawn into the tube. This will be big enough to well and quickly cover a quarter sheet of paper; beyond that size I do not think he will succeed satisfactorily, without a properly constructed broad, flat brush. One ounce of solution will suffice for use with the Buckle's brush; but great care must be taken to cover the whole surface of the paper, and to apply plenty of stuff to sensitise it equally, the excess being returned to the bulk. But with a small quantity of solution it must be remembered that it changes in character with every piece of paper sensitised.—Syntax.

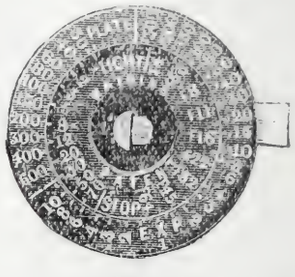
Our Editorial Table.

The Watkins' Hand-camera Meter.

R. Field & Co., 142, Suffolk-street, Birmingham.

This neat and handy little meter has been specially designed for shutter work, and possesses the feature that it indicates half the exposure of other patterns of the Watkins' meters. The short instructions given for the use of the hand camera meter display the principles upon which its construction is based. The numbers of the factors are engraved on concentric circles made in metal, as shown in the cut, and the resulting calculation is easily read off.

Hold the meter to face the light, pull out a fresh surface of sensitive paper, and count how many seconds the exposed tint in



centre of meter takes to match in depth the tint alongside. This number is the light value.

The plate speed is given by number in the separate card of plate speeds.

Revolve face of meter so that the number representing speed of plate you are using is opposite the light value.

Then on the other half of circle the correct shutter speed to use will be found opposite the value of stop.

Or, if the shutter speed is decided on, the best stop to use will be found against it.

The shutter speeds are marked with a dash, $20 = \frac{1}{20}$

Example: Plate 60, light 3, *f*-11 = $\frac{1}{20}$ shutter speed.

In sea views an exposure $\frac{1}{10}$ that indicated should be used, or a stop if $\frac{1}{10}$ the area; for seashore or snow views, $\frac{1}{4}$

See that the light tested represents that falling on the subject. Do not test in heavy shadow when the subject is in open light. There is no need to use the meter for each exposure if light is fairly steady.

We shall take an early opportunity of putting the meter to actual test.

Messrs. R. & J. Beck, of 68, Cornhill, E.C., send us a copy of their new Frena pamphlet, which lucidly describes the various uses to which this popular little instrument may be put. Thera are several reproductions from photographs taken in the camera. A copy of the pamphlet will be sent to those who apply for it.

An Impressionistic Album.

Percy Lund, Humphries, & Co., Bradford.

The design of this tasteful album is due to Mr. Matthew Surface. It is elegantly bound in green cloth, and the leaves are of different tints of brown and grey, the openings having narrow white borders. The photographs slip in from the sides of the leaves. The Impressionistic Album, which is made in two sizes, half and quarter-plate, appeals forcibly to the eye of the artistic photographer, who will find it a refined and pleasing change from the old-fashioned variety of album. It is admirably adapted for views.

Archer's New Enlarging Easel.

Archer & Sons, 43–49, Lord-street, Liverpool.

This enlarging easel consists of an upright frame, adjustable in height from the floor. It is fitted with a 15×12 dark slide, taking all sizes of bromide paper up to 15×12. The bromide paper is kept in the slide until the exposure. A dummy paper on the outside is used to focus the enlargement, after which the slide is slipped into a second groove, which brings the bromide paper into register. The slide drawn falls over the back, while the exposure is made, and the back comes out for convenience. The feet of the stand fold up flat, so that the whole thing can easily be stored away in a corner of the room.

Archer's Tourist's Hand Camera.

Archer & Sons, 43–49, Lord-street, Liverpool.

The new tourist hand camera of Messrs. Archer has features of great value. The slides fit into the camera in a simple manner; there is a short bellows to focus by; a scale of distances with indicator; rising front; blind shutter fitted behind the lens; rectilinear lens with iris diaphragms, and the ground glass screen is always in position, being held there by a spring register. A brilliant view-finder completes the equipment of the camera.

News and Notes.

Mr. J. Snowden, care of Messrs. Percy Lund, Humphries, & Co., is now Hon. Secretary of the Bradford Photographic Society.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, March 31, 1897, at eight o'clock, last Travellers' Night of the season. *Italy*, with lantern illustrations, by Mr. F. W. Hindley.

We have received the Annual Report for the year 1896 of the Liverpool Amateur Photographic Association. We gather from the fifty odd pages of the report that the Association is in a flourishing state.

The Borough Polytechnic Photographic Society have now become affiliated with the Royal Photographic Society, and are represented on the Affiliation Committee by Mr. P. C. Cornford and the Hon. Secretary (Mr. P. J. Brown).

Mr. L. Hayward writes: "Summer is coming, and many of us want sunlight stopped out of our studios. Many things have been tried, but I find the following beats all: White lead, Prussian blue, lamp-black, and paraffin oil. Make the colour a good sky blue, put it on with a brush, then stipple with a soft pad of rag. It can be cleaned off in winter with a damp cloth. If any of my brother workers like to try it, they will be pleased with the results."

The Birmingham Photographic Society's Twelfth Annual Exhibition will be held in the Exchange Assembly Rooms, New-street, on May 3, 4, 5, 6, 7, and 8, 1897. Five open classes will be included in the competitions, with silver and bronze medals and certificates in each class. The Judges will be Rev. T. Perkins, M.A., J. A. Hodges, F.R.P.S., and Charles Morgan. The Exhibition will be opened at two p.m. on Monday, May 3, and continued from ten a.m. to ten p.m. each following day. There will also be an exhibition of apparatus, and lantern entertainments will be given each evening. The Hon. Secretary is Mr. C. J. Fowler, Court Mount, Erdington, near Birmingham, of whom particulars and entry forms may be obtained.

A new signalling light, which has been favourably reported on, has been invented by Colonel Miklashevski, of the Russian Engineers. It is described as possessing extraordinary power. Its signals were read at a distance of thirty-four nautical miles, and the inventor hopes, by means of reflecting mirrors, to increase the distance to nearly sixty miles. Its form is compact and its weight is about seven pounds. The apparatus contains spirit and two distinct powders, one green and the other red, of which the composition is the inventor's secret. The working parts are two tubes, ending with pear-shaped balls, pressure upon which causes the emission of a brilliant red and green flash, and by a combination of these coloured flashes messages are transmitted. The cost of each lantern is about 100 roubles.

Meteorological Exhibition.—An Exhibition of meteorological instruments in use in 1837 and 1897 was held last week by the Royal Meteorological Society, in honour of the Queen's Diamond Jubilee, at the Institution of Civil Engineers, Westminster. The collection was a large one, and included all kinds of barometers, hygrometers, rain gauges, and other instruments. Among the exhibits was a mercurial thermometer about 100 years old, which was presented to the Society by Mr. W. Ellis, and is still practically perfect. There were also three spirit thermometers, the oldest of which was purchased in 1818, and which are still used in Messrs. Strutt's mills at Belper; a centigrade thermometer, made by Gay-Lussac; and the original maximum thermometer, made by Professor J. Phillips, F.R.S., in 1832. A curious pediment barometer, with a large spirit thermometer, was lent by Sir E. H. Verney, and a large barometer made in 1837 for the Society, with a tube and cistern capable of containing seventy pounds of mercury. It was thought that this would obviate the necessity for applying capacity corrections. Among the modern exhibits were included a great variety of self-registering instruments, such as Richard's self-recording rain gauge, and Negretti & Zambra's electrical apparatus for recording changes of temperature at any hour of the day. An interesting model of a climatological station, with all the requisite instruments, such as thermometers, rain gauge, and sunshine recorder, was arranged. Some beautiful photographs of clouds, ice crystals, lightning flashes, and snow drifts were also exhibited, and a portrait of Mr. Luke Howard, F.R.S., who may almost be termed the father of meteorological study in England. Photography was naturally well represented in the Exhibition, being much used in registering as well as illustrating. Among them were photographs showing the method of measuring cloud altitudes; photographs of various meteorological instruments, clouds, lightning, &c.; photographs of sundry effects of storms, &c., such as iron roofing pierced by hailstones, an oak-tree struck by lightning and apparently almost split into matchwood; views of ice on the Thames, snowdrifts in the Isle of Man, &c.; a series of photographs of a waterspout; and, in connexion with this subject, we noticed an instrument illustrating the formation of a tornado cloud, which from time to time was set in motion. An exhibition of slides, illustrating the form and movement of clouds and waves, was given by Mr. Birt Acres, F.R.Met.Soc.

Croydon Camera Club's Annual Dinner.—Presentation to Mr. H. E. Holland.—The Seventh Annual Dinner of the above Club was held on Wednesday, March 17, at the Greyhound Hotel, with all the usual tokens of emphatic success, between forty and fifty being present. The chair was occupied, as of yore, by the President of the Club, Mr. Hector Maclean, F.G.S., F.R.P.S., and who was supported by his Worship the Mayor of Croydon, Mr. Horsley Hinton, Mr. Thomas Bedding, and the officers and Council of the Club. The toast of "The Croydon Camera Club" was proposed by the Mayor, who, having humorously referred to himself as an undeveloped negative, incisively sketched the social, educational, and photographic benefits which attended membership of the Club. His Worship also spoke of the great pleasure he had received at the Club's public lantern show, which he had recently attended. Mr. Packham, F.R.P.S., toasted "The President," which was received with musical honours. Mr. Maclean having replied, the way was clear for the main event of the evening, led up to by Mr. S. Carley, who explained that, on the retirement of Mr. H. E. Holland from the post of Hon. Secretary, Mr. John Smith had organized the token of esteem which he begged to request the Mayor to be kind enough to present on behalf of the Club. This his Worship, accompanied by a few appreciatory and eulogistic words, proceeded to do, presenting Mr. Holland with a life-size half-length photograph of himself, handsomely framed and duly inscribed, the picture being the work of a member of the Club, Mr. Adolph Langfier (of Bender & Co.). Prolonged cheering greeted Mr. Holland on returning to his seat, and again when he acknowledged his appreciation of the honour done to him. Perhaps chief interest centered in the toast of "Pictorial Photography," given by the President, the claims of which he greatly extolled, at the same time reminding his hearers that "there is one glory of daisies, another of carnations," and, if they could not shine in art, let them do so in topography. He wound up with eulogistic references to Mr. A. Horsley Hinton as one of the main leaders of the new school of photography. Mr. Hinton, in reply, stated that to toast pictorial photography was, he believed, quite a new departure. It is a photographic phase, almost feminine in its power, of getting the photographer into its toils, and there for evermore keeping him. Mr. Hinton, however, disclaimed the reputation it was sought to fix upon him of being chiefly a pictorial photographer, and stated that it was inexplicable to him how he should have got the title. The toast of "The Photographic Press" gave Mr. Bedding the chance of displaying a good deal of dry humour, which was much relished, his complacent "grievances" being particularly enjoyed. The music, &c., was, at times, of the best.—*Croydon Advertiser*.

Rotherham Photographic Society's Annual Exhibition.—On Tuesday, Wednesday, and Thursday, March 16, 17, and 18, the Rotherham Photographic Society held its Eighth Annual Exhibition. The Mechanics' Hall, which had been engaged, was very attractively set out with some 500 photographs, contributed by members, and with a small but pleasing loan collection. As in former years, there were no medals or other prizes offered for competition. Although the work displayed had undergone selection, it was thought that a still greater weeding out would not have marred the effectiveness. Portraiture and figure studies were almost entirely absent, attention having been principally paid to architecture, landscapes, seascapes, and the class which might be termed "general views." A number of very meritorious prints had found places, and came in for a good deal of admiration. In regard to processes, the gelatino-chloride and gelatino-bromide were the most largely represented. Carbon was absent, but platinotype, represented by a few examples, stood prominently forward. Lantern and stereoscopic transparencies were shown in a room temporarily constructed beneath the balcony. The loan collection of photographs included fine examples from Mr. F. H. Worsley-Benison, Chepstow (seascapes in carbon); Messrs. Keene & Co., Limited, Derby (architecture, &c., in platinotype); Messrs. Wellington & Ward, London (architecture, landscapes, and portraiture, in bromide and P.O.P.); Mr. T. G Hibbert, Sheffield (landscapes and seascapes in P.O.P.), &c. Amongst the

members' work, the survey prints of Mr. James Leadbeater (Vice-President) were good evidence of the field open to photographers in South Yorkshire. A number of enlargements were also on view. The opening ceremony was performed by the Mayor (Alderman G. Neill, J.P.), and he was well supported. Mr. J. Gibbs discharged the duties of Chairman. On each of the three evenings there were crowded attendances. Music was furnished by the Eastwood Orchestral Band and Miss P. Cuttle (soprano), Mr. T. Lally (bass), and Master Louis Ripley (solo choir-boy). Miss Turner was the piano accompanist. The slide programme was as under: Tuesday. *Broadland*, lent by the Great Eastern Railway Company; Wednesday (St. Patrick's Day), *A Tour in Ireland*, by Messrs. G. W. Wilson, of Aberdeen; and Thursday, Members' slides. A number of yacht and other slides lent by Messrs. West, of Southsea (this firm also sent several prints of famous yachts), were put on the screen in the course of the two latter evenings. Mr. J. Leadbeater was an efficient lanternist, and Mr. H. C. Hemmingway (Hon. Secretary) was the guide to Broadland and on the Irish tour, while Mr. A. S. Leigh (Hon. Treasurer) described the members' slides, of which there was an excellent lot. It should be mentioned that an official catalogue was issued, and along with it was presented a fine collotype reproduction of Rotherham parish church.

THE PHARMACY ACTS.—On March 14 five complaints under the Pharmacy Acts were brought before Sheriff Mair (Edinburgh), one being against a doctor's shop assistant in Airdrie and the others against doctors' shop assistants in Coatbridge, in which they were charged with selling laudanum, belladonna, morphine, chloroform, and prussic acid, forming ingredients in certain advertised drugs, these being scheduled as poisons under the Pharmacy Acts, and the accused not being registered members of the Pharmaceutical Society. The prosecutor said the cases were brought purely in the public interest, and he did not ask for a vindictive penalty. Mr. Orr pointed out that the Act had been in operation for thirty years, during which time the doctors in Coatbridge had conducted their businesses in the same way as now, and yet there had been no prosecutions by the Pharmaceutical Society. He held that the late Act was not meant to cover cases such as these. The accused simply pleaded guilty, as they could not afford to fight the professional witnesses of the Pharmaceutical Society, being simply apprentice lads, who had to learn their business by serving their apprenticeship. He also animadverted on the Society having laid these cases in November last and only brought them up now, when the accused were deprived of the opportunity of getting any witnesses for the defence who may have been in the shops at the time. Mr. Russell made a similar statement for the accused. Sheriff Mair said he was not entitled, in dealing with these cases, in one view of them at all events, to express his own individual opinion as to the policy of these Pharmacy Acts. If it were not that he, sitting in the Sheriff Court, might be considered presumptuous, he would have had very little hesitation in condemning these Pharmacy Acts, and, not only so, but he would be perfectly warranted in saying that, but for the decisions of the Supreme Court in Scotland and in England, he would have had great difficulty in holding that the parties now before him fell under that Act at all. The section of the Act of 1868, under which the prosecutions were brought, provided that, from and after December 31, 1868, any person who shall sell, or keep open shop for the retailing or selling of, poisons shall be guilty of an offence if he is not duly qualified. One could easily see the possibility of holding that that section of the Act was not intended to apply to assistants employed in a shop at all, but was against the person to whom the shop belonged. His Lordship could not help expressing his surprise that, while it is notorious that in all the cases brought before him the parties keeping the open shops are duly qualified, those parties' assistants should be selected for prosecution under these Acts. It seemed very strange to him also that since 1868—well on to thirty years—although those shops in Coatbridge were open under the same conditions as now, and unqualified assistants were employed, not a single prosecution had been brought till now. He could not help having his own suspicion that, instead of these prosecutions being for the public interest, some private interest was involved of which the Court knew nothing. It looked to him as if there was some persons behind the scenes for purposes of their own that these prosecutions were being instituted. It was still more remarkable that Airdrie and Coatbridge should have been selected as the hunting ground for these prosecutions. Mr. Watt stated that there had been several in other places. The Sheriff: May I ask, Mr. Hill, if there have been any against the Apothecaries' Hall, Virginia-street, and the Apothecaries' Hall, Glasford-street, Glasgow, where it was notorious there were numerous assistants employed? Mr. Watt said the Society never proceeded unless they got information. The Sheriff: Quite so. But has Mr. Hill sent any men to detect these assistants? Mr. Hill might laugh, but his Lordship had a very strong suspicion that what he had said was true, and, to mark his sense of such conduct by the Pharmaceutical Society, he only imposed a fine in each case of half-a-crown, and half-a-crown each of expenses.

Patent News.

THE following applications for Patents were made between March 10 and March 17, 1897:—

PRINTING.—No. 6042. "Improvements in Apparatus for Printing Photographs from Negatives." C. SHAW.

KINETOSCOPY.—No. 6202. "Improvements in or relating to Apparatus for Photographing and Reproducing Objects in Motion." Communicated by A. F. Parnaland, France. A. J. BOULT.

LENSES.—No. 6218. "Improvements in Lenses." Complete specification. E. W. BARKER.

HAND CAMERAS.—No. 6324. "Improvements in Hand Cameras and Finders to be used in connexion therewith." H. BOND.

SCREEN KINETOSCOPY.—No. 6439. "Improvements in or connected with Apparatus or Machines for taking and projecting Animated Photographs." E. P. ALLAM, G. C. CALVERT, and J. FLEMING.

SCREEN KINETOSCOPY.—No. 6442. "Improvements in or relating to Apparatus for use in taking a series of Photographs in rapid succession, or for use in Exhibiting the same by Projection on a Screen or in other suitable manner, known as Animated Photography." R. H. EDWARDS.

TONING.—No. 6593. "A New Process of Toning Photographic Prints and Transparencies." W. B. FERGUSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
29.....	Camera Club	*Snowdon in Winter* and *Climbing in Dauphiné*. Henry Speyer.
29.....	North Middlesex	Informal Meeting.
29.....	Richmond	*Instantaneous Photography*. W. J. Colebrook.
29.....	Stafford Y.M.C.A.	*Pictorial Photography*. H. E. Burn.
30.....	Ashton-under-Lyne.....	*Ipswich and its Surroundings*. Tulloch Cheyne.
30.....	Birmingham Photo. Society ...	Members' Lantern Evening.
30.....	Bournemouth	*Architectural Photography*. H. W. Bennett, F.R.P.S.
30.....	Hackney	*Enlarged Negatives*. R. Beckett.
31.....	Borough Polytechnic.....	General Meeting.
31.....	Leigh	Competition: Agricultural Pursuits.
31.....	Leytonstone	*At the Leeds Convention*. Mrs. C. Weed Ward.
31.....	Photographic Club	*Italy*. F. W. Hindley.
April.		
1.....	Camera Club.....	*Mountain and West-coast Scenery at Home and Abroad*. T. C. Porter.
1.....	Goldsmiths' Institute.....	Demonstration. A. L. Spiller, F.R.P.S.
1.....	Leeds Photo. Society	*Lantern-slide Making*. John H. Walker.
1.....	Polytechnic	Open Night.
1.....	West Surrey	Social Night and Review of Exhibition.
2.....	Croydon Microscopical	*Photographing Meteorological Phenomena*. W. Marriott, F.R Met.Soc.
2.....	West London.....	*The Bernese Oberland*. H. Selby and G. Lamley.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 23,—Technical Meeting,—Mr. A. Haddon in the chair.

The CHAIRMAN stated that Mr. Montefiore Brice was unavoidably prevented from giving his lecture on *The Jackson-Harmsworth Polar Expedition*, which had been announced for this evening.

Mr. W. Atkinson showed two photographs taken by himself, illustrating Arab life in the oasis of Biskra, in the desert of Sahara.

PHOTOGRAPHY OF LIGHTNING.

Mr. W. N. JENNINGS, of Philadelphia, U.S.A., showed a series of lantern slides from photographs of lightning flashes, to which subject he had devoted his attention since 1880, originally with the object of demonstrating the inaccuracy of the zigzag representation of lightning by artists. He succeeded, in 1882, in securing his first photograph, and he believed this was the earliest lightning photograph which had ever been taken. The slides shown included specimens of many different types of flashes, and it was pointed out that heat cracks in glass in many cases followed very closely the outline of lightning flashes. From a stereoscopic photograph of a "wavy" flash, it was evident that the discharge was really spiral in character. "Beaded" lightning was probably produced by a rotating mass of molten matter following in the track of a thunderbolt, thunderbolts being due to collision between two discharges. Several of the photographs showed a dark division line or "core" traversing the length of the main stem, and this was attributed to reversal of the image of the brightest part of the flash. "Ribbon" lightning was said to be caused by wind broadening out the conducting path, and not necessarily by movement of the camera, an opinion which was tested by photographing an electric spark, when it was found that the image of the spark was widened in just the same manner by blowing across its path at the time of exposure.

Mr. W. MARRIOTT, Secretary of the Royal Meteorological Society, also showed slides of lightning flashes, some of which had been taken and sent to that Society by Mr. Sanger Shepherd. He suggested that the dark, dividing line, to which reference had been made, might be the result of the use of lenses of an unsuitable character. The fact that certain parts appeared brighter than other parts might be accounted for by the direction taken by the flash; lightning sometimes waved about considerably, and turned back upon itself, and the brighter portions in the photograph might arise from the doubled parts of the flash receiving practically a prolonged exposure. A succession of flashes along the same path caused the flickering appearance often noticed during thunderstorms, and the so-called "dark" flashes were the effect of reversal in consequence of the passage of a second flash in the path of a previous one. He thought that "ribbon" photographs were produced by movement of the camera, and remarked that, although lightning was said to be "instantaneous," there was no doubt that some flashes were of longer duration than others, and were luminous for a period sufficient to allow for the movement of the camera to an extent which gave a double image. Mr. Marriott also showed photographs illustrating the effects of lightning on human bodies, including a peculiar arborescent marking on a boy's arm, and mentioned a case in which a man was killed by being lifted from a haystack and thrown to the ground as the result of a flash of lightning.

Mr. W. E. DEBENHAM, referring to Mr. Marriott's remark as to lenses for the photography of lightning, said that for this purpose a lens should have a flat field and be free from astigmatism; the Goerz Anastigmat, or Dallmeyer's Stigmatic, would be very suitable.

Mr. JENNINGS did not think the character of the lens had anything to do ch the dark line of division; the line appeared in some flashes, but not in ers; he had set up two cameras, one with a cheap lens, and the other with best lens obtainable, and if the division occurred at all it was visible in both atives.

The ASSISTANT SECRETARY (Mr. Child Bayley) had noticed the dark line in ne photographs at the Meteorological Society's Exhibition a few years ago, I thought it might be accounted for in this way: if several flashes followed the same path immediately after one another, they would probably produce ersal in that particular path; but, if one or two of them happened to be on h side of the main track, they would yield the ordinary negative image, ile in the centre there would be the line caused by reversal. Something ilar occurred when photographing an incandescent electric light in a ninous state, when the bulb appeared white in the photograph and the ment black.

Mr. DEBENHAM thought the point should be investigated, and adverted to advantage which would arise from the use of multiple-coated plates, with ich reversal was not likely to ensue.

Mr. JENNINGS said he had used Seed double-coated plates, with which he d never had reversal, but the dark line had appeared.

Mr. CHAPMAN JONES remarked that, if there were two flashes close together, ere would be a dark core between them.

The CHAIRMAN thought it was generally admitted that the discharge was tirely oscillatory, that there was very seldom a single discharge from cloud earth, or from earth to cloud, but that a number of sparks passed back- rds and forwards; most probably these discharges did not all pass along ntically the same path, hence the central portion would not be illuminated the same extent as the paths on either side, and the dark core might be oduced in that way.

Mr. T. BOLAS suggested that, instead of taking negatives on plates, it would interesting to use a revolving cylinder covered with sensitive paper, by ich means important data could be secured.

Mr. MARRIOTT said the Meteorological Society would be glad to receive otographs not only of lightning, but of any meteorological or atmospheric enomena, including clouds, whirlwinds, the results of damage by storms, or ything in connexion with meteorological science.

STRIPPING FILM PRINTING-OUT PAPER.

The HON. SECRETARY showed specimens, sent by Mr. Otto Schölzig, of nts transferred to opal by means of the Novitas stripping film printing-out per, and also some lantern slides and prints on glass made in the same nner by Mr. H. T. Malby. The paper is printed, toned, and fixed in the ual way, and, having been immersed in hot water, the film is transferred to a porary support, and afterwards to the plate or other object intended for final reception.

Mr. Schölzig's representative demonstrated the process of transferring the nts, and

Mr. MALBY having given some details of his experience in the use of the per, the meeting terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

RCH 18,—Mr. W. D. Welford in the chair.

t was announced by Mr. RAPSON, in the absence of the Hon. Secretary, t the lantern-slide competition for the Henderson award would take place April 22.

A discussion upon hand cameras was introduced, failing any definite subject ore the meeting.

Mr. PARFITT remarked that he would buy no camera which was not fitted h a rising front.

Mr. DRAGE considered that a good hand camera should have a changing box. was far superior to roll-holders, dark slides, or magazines, and very easy to nipulate.

Mr. EVERITT thought the cost was against it. He had used, as a substitute, ardboard box, carrying an additional supply of sheaths, and effected the nge by aid of his coat, which he took off to protect the plates, inserting his nds in the sleeves to carry on the manipulations. The exposed plates were nsferred to the storage box.

Inquiries were made as to the production of the much-talked-of Bennetto our photographs, and a discussion ensued upon this and other minor tters.

PHOTOGRAPHIC CLUB.

RCH 17,—Mr. J. E. Hodd in the chair.

Mr. H. Harvey George was proposed as a member of the C ub.

Mr. EMIL KEHLE demonstrated his new

SELF-TONING PRINTING-OUT PAPER.

is paper, which is coated with collodion emulsion, has been invented in ler to produce a printing medium in which the toning and printing operations ll proceed simultaneously. The method, which is the subject of a patent, ends upon a principle claimed to have been discovered by the patentees t, in certain mixtures of gold and silver salts, or platinum and silver salts, gold or platinum will be deposited by the action of light upon the silver, vided that an organic acid be present. It is stated that either heat or light ll effect this reduction. The patentees claim, also, that a further colouring ion can be produced upon the mounted print by passing it through a very t burnisher, the print becoming warmer in tone when subjected to heat and ssure. In order to produce variations in the colours of the prints, it is cessary to use paper coated with differently proportioned emulsions. The tentees claim that the same principles are applicable to gelatine emulsion per, but that they have not yet produced so perfect an article as with col- lion. As regards permanency, the usual claim for absolute permanency is de for this process, and the demonstrator stated that he had in his posses- n prints five years old, which have so far proved quite stable. The price of the new printing paper in America is two dollars per gross for cabinet size. Mr. Kehle passed round some admirable specimen prints made with his paper. He proceeded to demonstrate the simplicity of the new method of finishing the print, which consists sipmly in placing the sufficiently printed image straight into an ordinary fixing bath.

The demonstrator was asked a number of questions, the replies to the most pertinent of which are included in the foregoing *résumé*. Some discussion arose around the point as to the nature of the change which took place in the prints in the fixing bath, and an under current of opinion was in favour of the possibility of the toning being being partly due to the action of the organic acid in the paper upon the hyposulphite of soda. It was pointed out, however, that it by no means necessarily followed that a sulphur-toned print should not be permanent.

The CHAIRMAN, in thanking Mr. Kehle for his remarks, said that the meeting would agree that he (the demonstrator) had shown the Club two things, viz., some excellent work as examples of what his paper would do, and a demonstration of its absolute simplicity.

Mr. W. D. Welford passed through the lantern a series of slides by Mr. Wm. A. Fraser, a member of the New York Amateur Photographic Society. Some of these were street scenes at night, *à la* Paul Martin, others sky and water effects. All were excellent in technique and pictorial effect.

Brixton and Clapham Camera Club.—March 16, Lantern Night, Mr. J. Gunston showing a series of slides illustrating *A Holiday in Switzerland*, which were more than good.—At the next meeting, April 6, Mr. Bullen (Gem Dry Plate Company) will demonstrate the working of the new A. C. film.

Camera Club.—March 18.—The usual Thursday evening lecture at the Camera Club was delivered by Dr. MILL upon

GEOGRAPHICAL PICTURES, WITH HINTS TO AMATEURS.

Captain Wilson Barker presided. The lecturer delivered a bright and instructive address, illustrated by a very large series of lantern slides, shown for convenience of comparison by means of two separate lanterns. The wide scope of the science of geography was first illustrated by reference to a graphic diagram, and then the value of camera records of geographical facts, as compared with hand-drawn pictures of the same facts, was effectively and amusingly shown. Suggestions as to the best procedure and points of aspect for securing trees and inclusive geographical records of places and phenomena were given, and the bearing of natural earth formations upon the position of towns gone into. The lecturer covered his wide subject by brief but telling comments upon a thousand other points suggested by his pictures taken in different parts of the world, and the audience accorded him the most enthusiastic vote of thanks for his address.

Gospel Oak Photographic Society.—At the General Meeting, held on Tuesday, March 16, the following officers were elected for the ensuing year:—*President:* Rev. H. Le Pla.—*Vice-President:* Mr. F. H. Hall.—*Committee:* Messrs. W. Beyer, J. Gittens, J. Hingston, J. Pridham, and C. Stone.—*Treasurer:* Mr. J. E. Rayner.—*Hon. Secretary:* Mr. W. A. Palmer.—*Hon. Assistant Secretary:* Mr. H. Billingsley.

Hackn y Photographic Society.—March 16, Mr. E. Puttock presiding.—The first Club Meeting of the season was announced for Saturday, March 27. Train to leave Liverpool-street for Ponders End at 1.50 p.m. Members' lantern slides were shown by Messrs. Rita, Rawlings, Westcott, Carpenter, Dunkley, Selfe, Walker, and Dr. Roland Smith. In the course of the evening Dr. ROLAND SMITH demonstrated

LANTERN-SLIDE MAKING BY REDUCTION.

He showed and explained the features of his own lantern-slide camera, in which slides may be made automatically by reduction from negatives of large size downwards, and either from the whole of a negative or a portion only. Several plates were exposed at the meeting, and then developed. Thomas's plates and developer were used, and the latter in the four ten per cent. solutions recommended by the makers, and consisting respectively of pyro, ammonia, ammonia carbonate, and ammonia bromide. The demonstrator showed how, by having several dishes in use at the same time, containing solutions, each with the ingredients in different proportions, development could be modified to suit the exposure or required tone. He said that with this method he had very few wasted plates, because, if the solution in one dish should prove unsuitable for a particular plate, the latter could be removed to another dish containing a solution more suitable to its requirements.

Leytonstone Camera Club.—March 17, the President (Dr. Turner) in the chair.—Mr. ARTHUR HANDS gave a very interesting evening on

TRICK PHOTOGRAPHY,

showing the various eccentricities, such as doubles, mirror work, combination printing from a number of negatives, ghost and spirit photography, &c., illustrated by a number of specimens, which were passed round.

Polytechnic Photographic Society.—March 18, Mr. F. Parker in the chair.—Mr. T. E. FRESHWATER, F.R.P.S., F.R.M.S., read a paper upon a simple method of

PROJECTING STEREOSCOPIC PICTURES ON THE SCREEN

by means of two lanterns. The author, having been introduced by the Chairman, gave the following account of his discovery: "The subject of stereoscopic projection has occupied the minds of many workers for years past, and at various intervals the subject has cropped up. De la Blanchere devised a complementary colour system. In 1858 J. C. D'Almeida suggested the projection on the screen of stereoscopic pictures by a two-colour method, which was fully described in the journal of the Photographic Society in August, 1858, but nothing more was heard of it for a long time. In 1891 THE BRITISH JOURNAL OF PHOTOGRAPHY describes the system as again invented by Dr. Schobhens of Antwerp; but no one seems to have brought the matter very much before the public. When Mr. Anderton in 1893 showed his lantern stereoscope at the Royal Photographic Society's Exhibition (which, by the way, is a very different

system to mine), various notes on stereoscopic projection appeared in the photographic journals. In 1896, when I brought my invention before the public, there appeared a paper in THE BRITISH JOURNAL OF PHOTOGRAPHY, copied from the *Scientific American* by Mr. Scripture, a Professor of Yale University, which states that my method is original. It is also, as far as I can learn, new, although it seems hard to believe that such a simple principle has not already been discovered before. Now this is what has happened in my case. When I first saw the Anaglyph, the invention of Mr. Ducos du Hauron, I thought that something of the sort might be applied to the lantern, so set to work for that end. I tried a great many different ways, dyed my films in all sorts of colours, red, blue, yellow, &c., used all the various coloured gelatines; I had heaps of carbon tissue made in various ways, but with poor success. The great difficulty was to get the proper colour in the many pigments that I used and in the spectacles through which it is necessary to look at the picture. The gelatines blistered in the lantern, so I had to fall back upon coloured glass. To show this system, it is essential to have a pair of lanterns either side by side or biunial. In the one lantern you place one half of the stereoscopic picture, and in the other lantern the second half. A piece of green glass is placed behind one, and a piece of red glass behind the other picture. When these two pictures are projected together upon the screen, in register, we see an undefined mass of black, red, and green. If the cover glasses are of the right colour value, if, looking through the spectacles, we cover up the green glass at the left eye, we shall see only one clear picture, and that red, though there are still the two pictures on the screen; now cover up the red glass, or shut the right eye, and the picture will be clear and green, although the red one just seen is still there. Upon looking at the picture with both eyes through the glasses, the red always to the right eye, you will see that the two pictures are blended together and stand out in bold stereoscopic relief. Let us consider a moment the cause of this effect. We have two pictures of the same subject taken with a pair of lenses, separated at two or more inches apart, so that one lens takes the subject at one angle and the other lens at another. Upon looking at these two pictures through an ordinary stereoscope with prisms, each eye sees its separate picture, and the impression received is of one picture, as seen in nature. Just the same with my system, as I shall presently show you. If you understand the principle on which this new stereoscopic projection is shown, you will more easily grasp my meaning. As I have said before, we have two pictures of the same subject taken at angles to the left and to the right of the centre; we now cover one with a red glass and one with a green glass. Your eyes seeing as the two lenses in the camera, the left eye more to the left and the right eye more to the right, all we have now to do is to distinguish the two pictures on the screen with its proper eye. To do this, we look at the left picture through a green glass exactly same tint as the cover glass, and at the right through a red glass; the eye separates its coloured picture, and we have conveyed to the brain one picture standing out, as in nature, in bold relief, so much so that, in the stereoscopic pictures I have prepared to show you this evening, the plants and other objects stand out in such a manner that one feels inclined to reach forward and pluck the flowers. To get the best effect, the subject should be large, *i.e.*, when shown on the screen, as near life size as possible. I will show you a party of travellers crossing a glacier with their ladders and ropes—you will see how real it is. In looking at this picture in the flat, one gets no idea of the difficulty these men have in hand. I have also a line drawing of a cross. This has a curious effect, it not only stands out as though solid, but, if you view it from one side of the room, the front bar will point at you, and as you cross the room this bar will follow, still pointing directly at you. The adoption of this system has been brought within reach of any exhibitor by Messrs. Newton of Fleet-street, and put upon the market at such a price that I hope we shall soon see it introduced into every lecture or entertainment. A few pairs of pictures thrown on the screen will give a better idea of a place than by any other means." Mr. Freshwater then passed through the lantern some thirty or forty pairs of slides, each picture causing applause.

Birmingham Photographic Society.—March 16.—Mr. JAMES SHAW lectured upon the production of

LANTERN SLIDES.

In his opening remarks, Mr. Shaw said that he used nothing but gelatino-bromide plates, and, of all makes, succeeded best with Paget slow. One of the most important matters in connexion with making good lantern slides was a good light to work by, and for this purpose he considered one thickness of canary medium in front of a No. 5 Bray's gas burner answered admirably. As in all photographic processes, he said, to obtain the best results required a good negative and a great amount of care. Lantern slides, it was said, were best when made by reduction, but, for all practical purposes, slides made by contact were indistinguishable from those made by the former method. A number of very fine slides were then passed through the lantern, after which Mr. Shaw proceeded to demonstrate his method of development, &c., using a developer composed of quinol, sulphite of soda, citric acid, &c. The results were highly satisfactory, and, after another series of slides had been put upon the screen, Mr. Shaw was very heartily thanked for his kindness.

Bradford and District Camera Club.—March 18,—A well-attended preliminary meeting of the Bradford and District Camera Club, at the Club's Rooms, Colonnade, Westgate, Mr. Walter Booth presiding.—Officers and Committee were elected as follows:—*President:* Mr. Walter Booth.—*Vice-Presidents:* Messrs. W. Harmsworth and J. Scarlett.—*Committee:* Messrs. W. Barker, A. E. Cole, J. Oates, and S. Hampshire.—*Lanternists:* Messrs. C. W. Appleyard and A. Cole.—*Librarian:* Mr. T. W. Anderton.—*Recorder:* Mr. W. Harmsworth.—*Excursion Secretary:* Mr. W. Hurchman.—*Treasurer:* Mr. E. H. Whetstone.—*Secretaries:* Messrs. W. Abbott and H. Ramsden. The Sub-committee submitted a draft copy of a set of rules, which were, after a short discussion, adopted. A syllabus of lectures, demonstrations, &c., were arranged. A special survey of the town and district will form one of the features of the new Club's work, and should be of practical advantage to beginners.

Bradford Photographic Society.—Mr. P. E. NEWSTEAD lectured be the above Society recently on the

GENTLE ART OF MAKING FAILURES.

The lecturer dealt at some length on his subject, and gave many receipt how a failure can be made and how to avoid one. The lecture was interest and amusing, and it was also in a certain sense very instructive to th members who are not careful about their dark rooms and where they k their chemicals. Mr. Newstead showed a good selection of both prints negatives, which he called "very good failures," and certainly, to most of members, they seemed everything he represented them to be. At the clos vote of thanks was given to the lecturer, and Mr. Newstead responded. lively discussion followed on the subject of whether this Society sho become affiliated with the Royal Photographic Society. Upon a show hands being taken, it was resolved that it should become one of the Affiliati

Devon and Exeter Architectural Society.—March 16.—A lecture given by Mr. CHARLES COLE (President of the Exeter Camera Club) on

ARCHITECTURAL PHOTOGRAPHY.

A preliminary description of the camera was given, with hints upon manipulation, especially with regard to the lines and planes of buildin The lecturer advocated making photography at once a handmaid of architect as well as a companion, for it gives the architect immense facilities for study the buildings of other countries, and delineates faithfully examples of b ancient and modern work. Not only should the old buildings be kept in m for those who follow us—and surely this was legitimate work for the archit —but we should hand down pictures of how we live and what our streets l like now, together with the dress of the people and street trades and sig The use of the camera in case of easement was shown. In regard to sketch and kindred matters, he did not think the camera should take the place sketchbooks and pencil, but they may be used in conjunction. To sketch w was a necessity for architects, and, no doubt, some possessed the faculty m than others. Every architect, among his other acquirements, should have intuitive love for, and a knowledge of where to look for, the beautiful. claimed for photography, if used aright and with an earnest desire to turn good work, that the operator would naturally turn to picture-making, a therein was a great field of learning, because he must possess and train faculty of artistic sight, and pictures were to be found in every thing and ami most unpromising surroundings. A large number of lantern slides were sho on the screen. These had been made by the lecturer, several of them bei from negatives taken for the "Photographic Survey of Exeter," which was beg some time ago. In addition to photographs of buildings, the slides show some very beautiful pictures of wood and water, also cloud effects, as well records of the blizzard. A vote of thanks was proposed by the VICE-PRESIDE (Mr. James Crocker), seconded by Mr. C. J. TAIT, and agreed to.

Leeds Camera Club.—Speaking before the above Society on the 17th ins Mr. BULLEN (of the Gem Dry Plate Company), in his lecture on

FILM PHOTOGRAPHY,

showed that a growing tendeney existed to revert to the older and what h long been considered "out-of-date" supports for the sensitive photograp film. He referred to Fox-Talbot's original flexible support, consisting of fi texture paper, which was followed by Archer's collodion base, from which t film was afterwards stripped, being strengthened by rubber dissolved in b zole. Ferrier, in 1879, introduced the first gelatine film, and about the sa time Messrs. Stebbing and Balagny were experimenting in a similar directi In 1886 the flexible support was first made a marketable article, several fir introducing a gelatino-bromide emulsion coated on thin Saxe or Rives's pap After development it was necessary to wax or castor-oil the negative to ma it translucent, and, this being both messy and unsatisfactory, it was soon ab doned for the transferotype process. This consisted of a stout pure pap coated first with a practically insoluble emulsion, produced by the aid chrome alum. After development, this film could be stripped from its su port and transferred to glass or any other suitable base. Celluloid as a supp was first introduced by Carbutt in America in 1881, and, although still ve popular, it possesses more than one defect. Mr. Bullen then showed, a practically demonstrated, the working of an entirely new film of his o production, possessing a non-expanding gelatine base. This film is very e to manipulate, and the results shown were very satisfactory. Mr. Bullen i be congratulated on an innovation of a decidedly useful character.

Moseley and District Photographic Society.—March 19.—The subjec the evening was

THE NON-TRANSFER GUM-BICHROMATE CARBON PROCESS,

the lecture and demonstration being by the retired Hon. Secretary, Mr. F Coop. The lecturer stated that it was his intention to treat the subject fro pictorial point of view, and stated that the process was one for the workers w strove for the most artistic results, and who had a good knowledge of nature her various moods, and were willing to take infinite pains. The lecturer sta that it was not usual for detail to be prominent in the most pleasing a strong pictures, and that photographs usually gave too much detail, and too little to the imagination. By the gum-bichromate process detail v easily suppressed, and one part could easily be darkened and another lighte at will. Objects which did not help the composition could be subdued completely obliterated. The lecturer then read most pleasing compositi appertaining to the needlessness of such elaborate detail. In discussing paper the remark was passed that rough paper was not of itself artistic, a if rough paper, through its roughness, drew attention away from the ch interest, *i.e.*, the picture, then it was quite as bad as glossy paper, for th both take from the picture. The demonstration which followed was m instructive and interesting. The pigment was first ground up in a palette w a little water, then equal parts of gum solution and bichromate solution w added until the mixture would wash easily on paper, giving a lig tint, like an artist's wash—not much affecting the translucency of paper. The colour was then applied with a hog's-hair brush to the p viously damped paper, giving as even a coating as possible. The film was t

brushed with a badger softener in all directions, until of one tint. Previously exposed paper had been soaking in cold water, and Mr. Coop now proceeded to develop these by pouring cold water over them. If they did not develop readily, they were treated to hotter water, when the picture seemed to appear out of the dark paper. If any part required restraining, the water was kept off that part. If it lagged and did not easily wash off, the water was concentrated on the sluggish parts. Thus a complete series of essentially differing prints could be secured from the same negative. During the demonstration the lecturer lucidly explained any point raised. The non-necessity for any transfer, and the non-continuing action were touched upon. In concluding, the lecturer pointed out that this was not a process for the technical or commercial photographer, but was essentially a very useful medium of expression for the artist on things photographic bent. Beautiful specimens of Mr. Fred Coop's work were passed round, in both finished and unfinished conditions. The lecturer could not resist the many demands for prints which were made of him, and many were pleased to carry away specimens of the non-transfer carbon gum bichromate process. Mr. Davidson (President) moved the vote of thanks. Mr. Williams (Hon. Secretary), in seconding, stated that these lectures and *demonstrations* were the things which would popularise and benefit the Club, rather than too much of amusement. The great trouble given to the lecturer in preparing all the specimens and pictures would appear to be amply repaid by the rapt attention—due enthusiasm which greeted him upon the vote being put to the meeting. It was whispered that the lecturer had just been successful in obtaining the silver medal in open class at the recent South London Exhibition, and that the exhibit was not in gum bichromate, but platinum.

Wolverhampton Photographic Society.—The Annual Meeting of this Society was held on March 19, Mr. H. E. Perry presiding over a small attendance.—The Treasurer's account was read, showing an adverse balance, mostly brought forward from last year. A very onerous period had been passed through, and there was a marked improvement in the condition of the Society, and the prospects were encouraging. The report of the Committee, which was also read, showed that the past year had been a very important one as regarded the number of meetings and the subjects dealt with. The Treasurer's account and the report of the Committee were adopted. Mr. J. M. Taylor was elected President of the Society for the ensuing year, and Mr. H. E. Perry, the retiring President, accepted the post of Vice-President. Mr. J. Gale was reappointed Lanternist, and Mr. F. J. Gibson, Treasurer; Mr. G. Hanmer was re-elected Hon. Secretary, and the following gentlemen were elected as Committee of Management:—Messrs. T. H. Cox, R. W. Deans, H. Holcroft, W. G. Orme, Dr. F. Dally, Messrs. F. White, F. H. Whitehouse, and O. T. Hayward. The meeting concluded with the usual votes of thanks to the retiring officers and Committee; also to Messrs. E. C. Middleton and C. J. Fowler, of Birmingham, and E. A. Day, from Walsall, for lectures delivered before the Society; and to Messrs. A. J. Leeson and W. T. Greatbatch, of Birmingham, for acting as Judges at the recent competitive Exhibition.

FORTHCOMING EXHIBITIONS.

1897.	
April 3–May 1	.....*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.
„ 19	..... Beverley Photographic and Sketching Society. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CONVENTION.

To the EDITORS.

GENTLEMEN,—Will you allow me to give your readers a few preliminary details as to the Great Yarmouth Meeting of the Photographic Convention of the United Kingdom.

The date has been fixed for the week commencing Monday, July 12, and ending Saturday, July 17.

At the opening meeting, our valued President, Mr. H. P. Robinson (it being the conclusion of his year of office) will vacate the chair in favour of his successor, the President-elect, Mr. F. P. Cembrano.

A number of papers and demonstrations of great interest and utility will be given in the spacious Town Hall of Great Yarmouth, which has been specially engaged for the Convention week.

It is also probable that a fine collection of photographs, illustrating East Anglian scenery, will be on view during the week.

The excursions which will be arranged for, details of which will be published later, will assuredly not fall short in attractiveness of the excursions of any preceding Convention, and Conventioners will have granted to them unusual facilities during the meeting.

Pending the issue of the usual circulars to members and official programmes, any desired information may be obtained of H. Harvey George, Esq., The Tower, Gorleston, Great Yarmouth, the Local Hon. Secretary; or of, Yours faithfully,

R. POULTER DRAGE.

95, *Blenheim Crescent, W., March* 20, 1897.

THE PACKING OF NEGATIVES AND TRANSPARENCIES.

To the EDITORS.

GENTLEMEN,—Will you not kindly call the attention of photographers, through your valuable and widely circulated magazine, to the great necessity for better packing of photographic negatives or transparencies on glass which are shipped to this country? As an amateur of about ten years' standing, I may be permitted to say that I have witnessed, with a great deal of regret, numerous cases of shipments of valuable negatives on glass, and of lantern slides also, which have been partially or entirely broken in transit. Not long since, I saw a shipment of lantern slides from one of your principal manufacturers in London, amounting to some 200 slides, of which nearly one half was broken. Many persons seem to think that it does not make any difference how they pack articles if they are to go by express; and, although this is a compliment to our carefulness, yet the idea goes too far. These packages cannot be carried by hand and are necessarily subject to some risk; but, it would surprise you probably to know how many shipments there are of negatives on glass which have been simply wrapped in several thicknesses of newspaper, tied with a string, and shipped without any further protection. All such shipments should be made in light wooden boxes, with a sufficiency of soft material all around them to protect from breakage, and it should be especially noted that there should be room enough in the box to accommodate the articles, so that, when the cover is nailed on, the pressure will not be so great as to break them. The difference in the cost of shipments is very slight on account of an increase of a few pounds in the weight of the package. For example, a package weighing say ten pounds would cost, from London to Chicago, 9*s.*; and a package weighing fifteen pounds would only cost 9*s.* 7*d.* These figures, of course, are only for transportation, and do not include United States Customs.

Any further information desired with respect to these shipments will be very cheerfully furnished by our agents, Messrs. G. W. Wheatley & Co., 10, Queen-street, Cheapside, and 23, Regent-street, Waterloo-place.

Hoping that the above may be the means of saving some photographers from regret at the loss of valuable material,—I am, yours, &c.,

C. H. CROSBY, *Vice-President and General Manager.*

United States Express Company, Chicago, March 4, 1897.

THE PROFITS OF PROFESSIONAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I thoroughly endorse the article on p. 179, *The Profits of Professional Photography.*

The idea is gaining ground that the profits are great, and, if the public once really credit this, the artist will have yet harder times to face. The artist is the individual who practically sustains photography as a profession and an art; he necessarily requires appliances and an establishment such as the "sweater" and the mechanical photographer does not. The artist will not turn out poor work, and necessarily expends a considerable amount in training and acquiring the technical knowledge required to turn out high-class work. For him to descend to the "12*s.* 6*d.* per dozen trade" would be like an artist selling his *paintings* by the dozen. In fact, artistic work must be produced by artistic minds and under suitable circumstances, both of which conditions require capital to sustain them.

The "sweater" and mechanic exist simply by catering for those whose tastes are commonplace or who absolutely cannot afford good work.

As there are always varied qualities, however, in every profession or trade, it cannot be rectified in photography, though it should be suggested to those who do not realise it that talent and good work must always demand higher remuneration than that turned out by the "sweater" or those individuals who work only by habit like a navvy.—I am, yours, &c.,

March 19, 1897. S. H. W.

THE KINESIGRAPH.

To the EDITORS.

GENTLEMEN,—Allow me to thank Mr. G. R. Baker for calling my attention to your issue of July 3, where I find, as he points out, not only that I am there given the credit of being the first inventor of the kinesigraph, but also that he himself was the author of the article in which this was done.

I fully accept his explanation of the reason which induced him to believe that I was merely the financier, and that Mr. Crofts was the actual inventor; but I can assure him that, beyond doing part of the work of drawing and superintending the construction, Mr. Crofts gave me no assistance whatever, nor indeed did he profess any knowledge of the subject.

The instrument was patented, made and worked before any other saw the light. I do not pretend that the results were in all respects satisfactory. What first machine ever is?

Moreover, improvements in film-making and other process have taken place since, of which all kinesigraphists have taken advantage. The specification was published at the time in *Electricity* and some other journals, and is now accessible to the public, though I regret I have not got one by me, and cannot therefore adopt Mr. Birt Acres' suggestion that I should trouble your readers with it.

Mr. Birt Acres objects to my saying that I should not care to have to defend the monopoly of any of the patentees since 1889. He chaffingly opines that it will be soon enough for me to decline the task when I have been applied to. True; but he somewhat mistakes my meaning. I referred only to such as claim the invention of the kinesigraph, not to those who claim to have invented subsidiary processes, or improvements in detail. Of these there have been several valuable ones, quite capable of withstanding an onslaught.

In one particular, my own invention is so vastly the superior—even now—of all that have come after it, that I am surprised practical men have not adopted it, now that it is open to the English public to do so.

They still continue to take very diminutive negatives which will hardly bear much enlarging, instead of taking them *of any size whatever*, as can be done by my instrument. And they still go pedlding along with a jerking, shivering band, when by my process there is no need for any intermittent motion whatever.

However, not being in the trade, I must sit still and wait till others choose to take advantage of what I have done.

Why cannot Mr. Birt Acres make a machine on the lines of my patent? He would soon have a monopoly of bands which would require no defending.—I am, yours, &c., WORDSWORTH DONISTHORPE.

Willows, Kintbury, Berks, March 22, 1897.

MISLEADING DISPARAGEMENTS.

To the Editors.

GENTLEMEN,—In reply to one who, in your last, falls foul of a report of the Croydon Camera Club, may I explain: (1) the gentleman in question *was not present at the meeting* he writes about? Some readers might, from his letter, think he heard all that took place. (2) Your correspondent is an active, and seemingly a militant, member of a "photographic section" of a Croydon society.

That he should go out of his way to publicly attack what I presume he considers to be a rival society by means of such laboured special pleading as his letter contains, will, I imagine, be most distasteful to most of those who belong to the aforesaid "section."

Any how, I trust you will agree with me that the above circumstances make it undesirable that I should discuss in detail what is, I venture to consider, a gratuitous misunderstanding of the report under consideration.—I am, yours, &c., HECTOR MACLEAN.

PROPOSED ARCHITECTURAL POSTAL PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—I am forming a Postal Photographic Club, the work of which shall be devoted entirely to architectural photography. To those who study this branch of our art, I think a club of this description would be interesting and instructive.

I shall be pleased to hear from any of your readers with a view to joining, accompanied by a specimen of their work. Only good workers will be admitted.—Thanking you for inserting, I am, yours, &c.,

Devonshire-square, Loughborough. J. E. UNDERWOOD.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affair should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Jakeman & Carver, 4 and 5, High-town, Hereford.—*Two photographs of Grace Murielle ("Sign of the Cross" Company).*

NEMO.—You are wrong in your supposition that the person you name is the advertiser you refer to. You had better place the matter in the hands of the police.

NITRATE OF SILVER.—X. B. writes: "Can nitrate of silver be got free from sodium or potassium? if so, will it be dearer than the ordinary nitrate of silver?"—Ordinary nitrate of silver contains no sodium or potassium, unless it is adulterated.

STAINED PAPER.—S. A. G. If your printer keeps the paper in the same room as he precipitates the silver from the hypo residues with liver of sulphur in, the rapid discolouration of the paper is easily accounted for. We are surprised that any one understanding his business should do such a thing.

CARBON PRINTING.—T. W. D. We do not see that there is any complaint to be made. The tissue has become insoluble by keeping, and it is well known that it does so. The makers, who supply it ready-sensitised only represent that it will keep about a fortnight, and you say you have had yours "not much more than a month;" therefore it is not surprising that it is now useless. You must not, as you appear to do, expect it to keep in its sensitive state, as does ready-sensitised albumen paper.

R. BECKER.—The pictures described were shown, but nothing has been revealed as to the method of their production. This is all at present known in connexion with the matter. If you have access to a file of this JOURNAL for the last eight months, you will find many references to the subject which may interest you.

COLOURING PRINTS FROM THE BACK.—COLOURIST says: "Would you kindly tell me where I can get the colours for painting on the back of the P.O.P., not the crystoleum process? I have been told you apply the colour on the back of a finished photograph unmounted, and the colours show through without rubbing the paper off back."—Probably any of the coal-tar colours, soluble in alcohol, will answer.

LIMELIGHT FOR ENLARGING.—T. PHILLIPS. An ordinary blow-through jet will do quite well for enlarging from quarter-plate negatives on to bromide paper 18×15. The coal gas need not be used under pressure; the ordinary house supply may be used direct. The only advantage to be gained by the use of a mixed jet, and both gases under pressure, is a shorter exposure—no great gain when that does not exceed a very few minutes.

STAINED PRINT; LANTERN SLIDES.—F. N. B. says: "Would you be so kind as to inform me the cause of the yellowness round the edges of the prints enclosed; also how to get the effect of the street lamps burning in lantern slides?"—The yellow stain is due to the print not having been left long enough in the fixing bath. The effect may be obtained by backing the lamps with a thin film of slightly tinted yellow collodion or gelatine.

WATER-COLOUR STAIN.—CONSTANT READER asks: "Will you kindly assist me in the annexed queries? 1. I copied a figure out of a group the other day. To do so, I blocked out the other figures with water colour. On removing water colour, I found it had stained the print all around the figure copied. I cannot wash it out. The print is on P.O.P. Can you give me any assistance through your valuable columns? 2. I am desirous of joining a Professional Society of Photographers; what is required to become a member?"—1. If the stain cannot be washed out by long soaking in water, we doubt if it can be removed at all. Probably something in the print has acted as a mordant. 2. Write to Mr. R. Child Bayley, Hon. Secretary of the Royal Photographic Society, 12, Hanover-square, W.

SENSITISING BATH.—SILVER BATH asks: "Will you kindly let me know how long a silver bath can be used before requiring renewal, the average number of sheets sensitised being fifty to sixty per week? also what is the best means of ascertaining whether the nitrates of ammonium or potassium are in excess?"—The bath does not require *renewal* at all, provided its quantity and strength be kept up by the addition of fresh solution. The strength of the solution can be ascertained from time to time by the argentometer, which is sold by all photographic dealers. This is not a strictly accurate test with an old solution, but it is near enough for all purposes in practice. The more chloride the paper contains, the more silver it will take from the bath. The presence of the other nitrates will do no harm.

PAPER NEGATIVES.—J. H. SADLER writes to the effect that he has some old Talbotype negatives to which historical interest is attached, and they now show signs of deterioration, white spots appearing. These are increased by heating to melt the wax, and also the heat develops brown stains. He asks: 1. Can these spots be removed; and, if so, how? 2. To what are the brown stains due? 3. What precautions are necessary to ensure the other negatives from these spots?—It would be impossible to offer an opinion without seeing the negatives. If our correspondent will send us one or two, a fair sample of the lot, we shall be pleased to advise. At the same time we should like to know under what conditions the negatives have been stored during the long period since they were taken. That information may be useful.

STUDIO.—H. H. HILL asks: "Could you give me advice upon building a studio? I am about to remove my business to another part of the town, and shall have to build a new studio. Shall be glad of a few hints. I can only build from south to north; which end would be best for sitters, &c.? My present studio is situated from west to east; sitters taken at west end. The length will be 27 feet; width, 9 feet; height from floor to commencement of roof, 9 feet; to top of roof, 3 feet. An early answer will greatly oblige, as I would like to commence at once."—Have the sitters at the south end. Five feet of the roof, and 4 feet at the sides, at this end, may be opaque; then about 13 feet of glass, and the rest opaque. Nine feet wide is rather narrow for a professional studio; a couple of feet wider would be better; in this case, the length of the glazed portion should be increased a foot or two.

RESIDUES; CARBON PRINTS.—F. E. G. writes: "1. Will you kindly advise me as to best way of keeping residue from negative fixing solution? For a considerable time I have used a large brown, earthenware mug about fourteen inches diameter and sixteen inches high, which size suits me very well; but the hypo works through and crystallises on the outside, and parts run down on the floor. Would it be better to have a wood box or cask, or are there special kinds of earthenware? Also, I would like to have your opinion on the following: 2. I do a considerable amount of work in carbon; lately, in turning out a number of old stock, I found them considerably yellowed in the whites. I cannot account for this, except it be because the alum has not been thoroughly washed out. Would this account for the change of colour?"—Ordinary paraffin oil casks are about the best and cheapest vessels for the purpose. Stoneware, such as is made for acids, will answer, but common brown earthenware is not suitable for storing hyposulphite solution in. Scarcely. 2. We should surmise some of the bichromate was left in the prints, but that should have been manifest when they were first finished. Possibly there may be something wrong in the transfer paper. Was it single or double?

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1926. Vol. XLIV.—APRIL 2, 1897.

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EX CATHEDRÂ.

ACCORDING to *Nature*, a meeting of Presidents of various Scientific societies in London was recently convened by the President and officers of the Royal Society, to consider whether any, and if so what, steps should be taken to commemorate the sixtieth year of Her Majesty's reign. It was unanimously resolved: "That a fund to be called the Victoria Research Fund be established, to be administered by representatives of the various scientific societies, for the encouragement of research in all branches of science." The President of the Royal Society has communicated this resolution to the scientific societies, with a letter asking whether support would be given to it. We believe we are correct in stating that the Royal Photographic Society was not invited to participate in this movement. No doubt the omission was an oversight. It is, of course, obvious that the Royal Photographic Society possesses undeniable claims to be included in the list of societies organizing the Victoria Research Fund, and we hope to hear, in due course, that it has been asked to support the scheme.

* * *

Absit Omen! The other evening, when passing the establishment of a prominent West-end photographer, whose window has for years been employed for the display of photographs that were seldom without a small knot of admiring critics in front of them, we noticed that a remarkable change had come o'er the familiar scene. The window was empty, the photographs had been removed, and a notice intimated that, although the photographic business was being continued as usual upstairs, bicycles were in future to fill the window and become the medium of trade on the ground floor. To the popularity of the bicycle many commercial vicissitudes, we believe, are attributed, but we trust that photographers have no reason to view the wheel fever unsympathetically, and that this instance of the encroachment of the wheel upon the domain of the camera is, and will remain, a solitary one.

* * *

We have received a lengthy newspaper report of Dr. Nansen's lecture, *Across the Polar Regions*, that was delivered at Bournemouth shortly before the intrepid explorer left this country for Paris. The feature of immediate interest in connexion with the lecture is that it was delivered under the auspices of the Bournemouth Photographic Society, who are to be congratulated on the success of their enterprise. The lantern slides of Arctic scenery, the *Fram*, and its crew were very popular with the large audiences that assembled to hear Nansen's thrilling story.

* * *

The Royal Photographic Society's annual election of Council has for years past supplied many of its members with the opportunity of indulging in a little mild and harmless excitement of the kind that characterises more momentous contests in the political and municipal worlds. There are some who look upon this annual outbreak of election fever as peculiar to the Photographic Society, and wholly absent from the annals of other learned bodies of equal or higher standing. This is a delusion, as our acquaintance with the technical press has often shown us. We observe, from a letter in the last number of our esteemed contemporary, the *Chemical News*, that the Council election of the Chemical Society has been provocative of a considerable amount of feeling between the supporters of rival candidates for the presidency of that Society. The author of the letter, Professor H. E. Armstrong, reads the rebellious young bloods, who are pushing the claims of their own candidate, a somewhat sharp lecture, and makes allusion to that gentleman as "pledged to 'reform' the Society by

abolishing the old buffers and ensconcing the young radicals in their places." There is a curious likeness in all this to recent occurrences at Hanover-square that is worth noting by those who think the Photographic Society the only body of its kind in which party politics are permitted to engage attention.

* * *

An announcement in the March number of the *American Journal of Photography* informs us that Mr. Julius F. Sachse, after seven years' service, retires from the editorial chair and active management of that journal. Mr. Sachse invariably exercised his functions with dignity and good taste, and his contributions to photographic literature have always been characterised by great knowledge and painstaking care.

* * *

We are pleased to learn from the many long and appreciative notices in the principal Calcutta newspapers that the Calcutta Photographic Exhibition, the Judges' awards at which we gave on February 26, was a very great artistic success. Those notices, by the way, appear to have emanated from capable and discriminating hands, a respect in which the Calcutta newspapers have the advantage of many of their home contemporaries. Animatography, radiography, lantern projections, and other entertainments were among the additional attractions of the Exhibition, which drew together a remarkably fine collection of the best English and foreign work. The local support appears to have been most useful and thorough. The Indian Society's *Journal* remarks, *apropos* of the Society's management of the Exhibition: "We claim to bind together photographers all over India, to keep in touch with the photographic world outside India, to assist beginners, and generally to form a sort of photographic freemasonry, the wide-reaching effects of which can scarcely be estimated." In these aims the Photographic Society of India has unquestionably achieved conspicuous success.

STUDIO BUILDING.

To judge from the number of queries that have reached us for replies in the Answers to Correspondents column during the last couple of months, the season for studio building has fairly commenced; hence a few timely hints on the subject will, doubtless, be acceptable to many. It is not the intention in this article, however, to touch upon the most desirable forms of studio to erect, or the most suitable dimensions to adopt. To do that would, to an extent, be futile, as, in the majority of cases, they have to be governed by the space available and the location of surrounding buildings, also by the ideas of the district surveyor or other local authorities. Our immediate object is merely to give a few hints which, if acted upon when the studio is designed and while it is being erected, may save a deal of trouble in the future.

Where is the photographer who has not been troubled with a leaky studio roof? What is more unsightly than stained blinds, curtains, carpets, backgrounds, and accessories, generally from leaking roofs? and what has a more depressing effect on sitters than a general appearance of dirtiness and dilapidation in the studio? Yet these are the unavoidable accompaniments of faulty roofs, which, in most instances, are irremediable, or, at least, for any length of time together, though they might have been avoided had more care and thought been given to the subject when the studio was built. One of the great faults with the majority of studios of the older form is the unnecessary amount of glass they contain. In the early days was thought that, the more glass there was in the studio, th shorter would be the exposure required, hence many studi were veritable "glass houses." In their construction the sa bars were of the thinnest consistent with safety—and som times not even that—in order to obstruct as little light possible. With such buildings it is utterly impossible to ke them watertight for long together. We were recently in studio of this description during a storm of wind and rai and the extent to which the roof was bent inwards by eve heavy gust of wind seemed really dangerous. Of course, th roof could not bend so much as it did without causing the ha and inelastic putty to crack or separate, in places, from th glass, and thereby increase the leaks which were already u pleasantly manifest all over the place. Again, the weight of man on such a slender roof, when painting it or replacing broken pane of glass, would necessarily produce fresh leak In more modern studios it is not customary to have such large expanse of glass as in the older ones, but still, in mar cases, there is far more glass than is necessary, and the mo glass there is in the building the more trouble there is maintaining it in a weather-tight condition.

There is no doubt that one of the most important points connexion with studio building is too frequently overlooke namely, rigidity and stability. As a rule, the sash bars a too slight, and the plates at the eaves and the ridge are n stout and rigid enough, as these must be considered the re foundations of the glazed portion. Of course, the larger th building is, the more substantial should be these foundation particularly the ridge plate, which is really the backbone, to speak, of the structure. Therefore, in the studio buildin great stability should be insisted upon from the builder. is always advisable to have the glass in as large panes possible, as then there will be fewer laps and less sash ba to keep painted and otherwise in order. Then stouter sa bars will necessarily be essential, but one stout bar will o struct less light, and be less dazzling to the eyes of sitte than two or three slender ones.

The glass used for the roof should be thicker than th which will suffice for the sides, in order to avoid injury hail storms. It should be selected and fitted with judgmen for sometimes it is slightly curved in parts, and it follows th if two squares which are in this condition are fixed with th curvatures in opposite directions, there will be a wide int vening space where they overlap to harbour dirt or permit water being blown through in wet weather. Before glazi the sheets of glass should be painted on each side, alo their edges, with good oil paint, the width of the rabbet the sash bar, or a little more, as then the putty will the mo firmly hold to it. The putty used is of great importanc and should be well looked after. It should be made with th best linseed oil, instead of the cheap common oils which a generally used in ordinary commercial putty.

When a new studio is built, it is well to make provisio for conveniently and safely painting or repairing the outsid as occasion may require. If small angle irons be secured the astragals of the roof, they will prevent a board plac thereon from slipping, otherwise the usual plan of drivi nails or screws into the bars will have to be resorted to, a thus cause fresh risk of leakage.

This article, as we said at its commencement, is merely give a few hints to those who are about to build studios, that a great deal of trouble may be avoided in the future.

Acetylene as a Heating Agent.—Mr. A. E. Mumby, of stead School, Essex, has been describing his experience in this ection with the now-tabooed gas. With a six-inch pressure of , a perfectly non-sooty flame of good size can be obtained with a nsen burner, the flame being steady, noiseless, and evincing no dency to strike down unless turned too low. A foot per hour s about the consumption of the gas. The flame he finds very hot, may be readily believed, when, as he points out, one volume of tylene is equal to two of ordinary gas.

Recent Advances in Röntgen Ray Photography.—. J. Macintyre, F.R.S.E., has been lecturing before the Philo-hical Society of Glasgow, and describing how recent modes of rking have put greatly increased power in the hands of the in-tigator. It is now easy to photograph either hard or soft structures, both together on the same plate. He described how it was possible photograph the interior structure of one side of the head without sign of intervening structure. He exhibited a cinematograph film, wing the movements of the bones of the leg in the act of walking.

It is worthy of note that Dr. Macintyre could exemplify from sonal experience the depilatory and generally "scorching" action the rays on the back of the hand. After some few days' work h the rays the skin changed its colour, and looked as though it l been scorched in the sun. Then the skin peeled off, and for r months there was scarcely a vestige of hair on the back of his nd.

Stereoscopic Cloud Views.—We have on previous occa-ns alluded to the desirability of greatly widening the distance ween the two lenses when taking stereographs of very distant ects, but we imagine that many of our readers will be somewhat prised when we write of views taken with the two lenses, or, more perly speaking, the two cameras placed more than a quarter of a mile art. Yet this has actually been done, and with great advatage, in uring photographs of clouds. Mr. John Tennant, writing from e Boltons, S.W., to *Nature*, describes how, since '94, he has been gaged in making stereoscopic studies of clouds in this manner, and writes that he has found a practical value in the method beyond direct interest. He states that the method of pin-pricking responding points is liable to error, through the vagueness of cloud outlines, but that any error thus made is easily detected the stereoscope. He writes further that his "photographs were ken by visible signal, without electric connexion, some of them th a base of fully five hundred yards, and the clear stereoscopic finition seems to show that, in ordinary cases, the expensive ctric connexion of the cameras may be dispensed with without ecting the value of the plates for purposes of measurement."

Tele-photo Lenses for Stereoscopic Views.—As it quite evident from Mr. Tennant's eminently practical communica-n that there is no difficulty in obtaining stereoscopic photographs distant moving objects, it is equally plain that with stationary jects the matter would be still easier. Now, we already know at, though tele-photo lenses have subserved a distinctly useful rpose, the usefulness of the results they have led to would be, for ny purposes, infinitely increased if they were made stereoscopic. o tele-photo lenses on a stereoscopic camera for distant objects uld be utterly useless, no more stereoscopicity of effect would be oduced than would be obtained by mounting two prints from one gative. If, however, a single camera were used and carefully velled, and then a second view of the distant object taken with the mera again carefully levelled at a distance on a base line of a hundred two yards, the resulting picture would be perfectly stereoscopic, d, in the case of inaccessible mountains, military works, or any ner subject of which more than mere contours were needed, in-rmation of the highest order would be obtained, which no ordinary otograph, however sharp, could convey. We feel quite sure that such a mode of photography for explorers and for military purposes, if carried out, would prove to be of extreme value, and capable of being carried out without any additional outlay.

A Powerful and Efficient Means of Working X-ray Tubes.—Under this heading Messrs. Charles L. Norton and Ralph R. Lawrence have communicated to *Nature* a new mode of working X-ray tubes, which, from their own account, seems to promise an increase of power of penetration, which may be termed phenomenal in character. "A condenser of considerable capacity is first charged by connecting its terminals to the ordinary lighting mains; it is then disconnected and discharged through the primary of an induction coil. Any good induction coil can be used in this way, with a single change, viz., a new primary. The primary should be a few turns of heavy wire on a finely laminated core." There is needed a fresh commutor, capable of rapid charging and discharging. That used by the experimenters named had six segments, and was worked by a fan motor, producing 2000 revolutions per minute. "It is necessary to have the primary of the coil well insulated, not only from the secondary, but its own turns must be well insulated from one another and the core. An easy and effectual way with a vertical coil is to place the laminated core in a glass tube, upon this wind the primary, then place the whole in a large, heavy tube, closed at the bottom, and fill with oil. . . . Photographically, X rays obtained in this way are no less powerful. Excellent, fully timed photographs of the hand can be taken in twenty-five seconds with the tube twelve inches from the plate, photographs not merely showing the outlines of the bones, but showing the details of the bones, the finger-nails, tendons, &c. . . . . It seems apparent that we have a simple method for exciting the X-ray tubes far more powerful and efficient than any yet used . . . . and requires no more skill or knowledge of physics than the ordinary practitioner can supply."

Defects in Glass and Reflections.—*Apropos* of our remarks on this subject in last issue, it has struck us that want of parallelism on the surfaces of the glass is perhaps but a portion of the cause of the alteration of position of the two reflections there mentioned. Glass, when submitted to unequal pressure, as in rolling an uneven layer of semi-molten "metal," acquires properties which cause it to both reflect and refract in an unequal manner, and, no doubt, to this source may be traced a portion of the injurious effect produced in transmitting light through imperfect screens. Still our remarks hold good on the subject of selecting such samples of glass as show, when examined by the reflection test, the least abnormal appearances.

Those who wish to study this phase of reflection from the back surface of glass, and witness the effect of defects of surface and of homogeneity in a most pronounced manner, may do so by the aid of an ordinary silvered glass mirror. We have such a one before us as we write, an ordinary hanging mirror of a not very expensive class, about 14×11 in dimension, and, judging by the reflections, with a plate about three-sixteenths of an inch thick. This mirror is propped in a perpendicular position in the centre of the table, and a candle is placed about a foot in advance of it, and about the same distance clear of one side. When viewed from the opposite side of the glass, a series of reflections of the candle flame, numbering eight or nine, are seen, the first reflection from the silvered surface being the brightest, the rest gradually becoming fainter, until the last is barely visible. As viewed at present, the brighter reflections are to the left, the successive images falling further and further away from the light. Now, changing the candle and the point of view to the opposite side, and maintaining as nearly as possible the same relative positions, a similar series of images is seen. This time, however, while the brightest or first reflection is one removed from the extreme left, the succeeding ones fall each *nearer and nearer* to the light, or the reverse of the previous case. Similarly, turning the glass on its side, the series of reflections takes an upward and downward direction, according to

the side of the glass that is uppermost, thus showing, as did the experiment quoted last week, that the plate apparently possesses an optical axis.

But the most noticeable feature is that, at one end of the glass, the individual reflections stand wide apart and distinct from one another, while, at the other, they are so close together as to overlap, and it is impossible, by viewing them at any obliquity of angle, to get them separate. This points distinctly to want of parallellism between the two surfaces, which, slight though it may be, suffices to make itself plainly visible in this manner.

DIGRESSIONS.

No. XVI.—Fashions in Photography.

A great critic has said, "The essence of art is to be eternal, and the essence of fashion is to change." This would be a hard saying if it had too close an application in practice, yet it is finely true. An essential element is to be traced through all great art for ages, but the photographer may plead the example of the painter if he indulges in what is unworthy in principle, but not without interest or convenience in practice. Let us see what example the art of painting has set us in this country. The influence of fashion is easily traced in the art of the last century, and indeed up to our own time, during which period it dragged its weary way, doing good work occasionally in portraiture and landscape, seeing nature only by the borrowed light of teachers, and reducing her homely truths to fashionable conventions. The *dilettanti* of the time insisted that landscapes should be painted, not like nature, but in the "pleasing and elegant style" of Zuccarelli, for whose pictures it would now be difficult to find a place in any modern house of taste. No green was allowed, and a brown tree was essential, so also was a ruined tower in the middle distance. Then came "High Art," and artists talked of the sublime and the inspiring mysteries of their craft and painted "great" pictures, too big for anything. This fashion reigned more or less until the death of Haydon in 1846. Then began the greatest revolution that art has seen, which also ended in a mere fashion, but not until it had done its appointed work. The pre-Raphaelites taught painters to look more closely to nature than they had ever done before—a much-needed lesson, not necessarily to be practised for ever, but with a permanent influence. Then followed the inevitable reaction, and we are now undergoing minor fashions, chiefly adapted from the French: Whistlerism, impressionism, realism, Glasgowism, and those other little evanescent phrases in art which depend partly on the art of the juggler who *talks* his audience into seeing that which is not. Most of these have had their influence for good or evil, for it is a poor thing that has nothing in it. Their good effect is shown in the way the best painters now see atmosphere in nature, their worst in the way the inferior painters see nothing else; and the time will come when, the present easy fashion of making pictures being over, nature will be new to the latter painters, as they will have to see it from the point of view of the succeeding fashion.

In the same way as the general style of picture is a fashion so is the individual painter. Velasquez, for instance, has had an extended good time, which, however, is now running to seed. Perhaps one of the most striking examples of change of fashion is that in the case of Benjamin West, a President of the Royal Academy, who was once worshipped as the greatest painter in England—almost, in fact, within measurable distance of the old masters. Perhaps the change is best shown in figures. A picture for which he was paid 3000*l.* sold by auction a few years ago for 15*l.*, and was dear at that.

But why go on? I am breaking a butterfly on the wheel. I only want to show that the humble photographer has an excellent precedent in his grand brother the painter for considering changes of fashion, for, after all, we must provide for the multitude, and, any way occasionally, leave the eternities to take care of themselves, for art is now the necessity of the many, instead of being, as it formerly was, the luxury of the few, and perhaps for the many

"A truth
Looks freshest in the fashion of the day."

It just strikes me that it is well I am not under bond to say anything of consequence in these papers, as this seems to be a particularly "moony" subject, and there is influence in the time of year. April is the most delightful month to the reasonable photographer who does not begin his year's work too soon; he has all the practicable part of the year to look forward to. To the wise man, who has lain fallow all the winter, spring comes with the greater zest. There are those, I know, who advocate continuous work all the winter; they do it with the best intention, but it is often fatal. Everything is in favour of a close time; even Dame Nature, who is pretty persistent in most things, abhors constant labour at the same occupation. It was she who invented summer and winter, and probably the Sunday rest, as early as paleolithic man, that we may use our bicycles at least once a week. Sunday was kept nearly pure until the time of the Puritans, who diverted it from its intended use, and put it to preaching purposes; it is now slowly returning to its former use. The sweet influences of the time extend themselves to him who has hibernated during the winter, and he is free from the depressions that would be due to winter failures. As yet, none of the successes of hope have turned out the failures of reality. In spring our plates are clean, and former experience has no power to persuade us that it is not every plate that will not survive as a picture.

Perhaps this is as good a time as any to take a forward glance, and speculate upon what is before us; to imagine what is the stream of tendency, in both the business and pleasure of the practice of our art; in short, what are to be the photographic fashions during the year.

It is the professional photographer who has the chronic complaint of want of business, to whom fashion in his art is of most importance; the true artist, the original photographer, is not in want of adventitious aids. In portraiture an Annan or a Hollyer does not require to have "something new such as others do" constantly dictated to him, they are always doing new things of their own, or old things so well as not to require them; but I can see "money" in a good latest fashion for the vast bulk of portraitists. I wish I could see more evidence of an attempt at something of the kind. I hope nothing of the midget or photo-button, or any other variety that will make photographs still cheaper, will be attempted. It is not so much cheapness as better and brighter work that is wanted; I don't mean better technically, but in better taste than the work that, as a rule, we are accustomed to. I am glad to think, if I may judge by what I see in reception-rooms, that a demand for whole-plates is arising and that there is a chance of getting free of the tyranny of the cabinet, a demand that is not in the least due to the desires of the public, but created by the efforts of a few photographers. This is good, healthy business, and I hope it may succeed; it will if photographers will lay themselves out for this kind of picture, treat their work with respect, and not try how cheap they can make it. They must avoid shiny and tinted papers. There is room for original fancy and taste in an 8×6 picture; the 15×12 direct head is also more in evidence than it used to be.

There is one anomaly I always find it difficult to understand. If you ask the photographer, who grumbles at want of business most, why he does not endeavour to do something more startling to attract customers, he usually replies to this effect: "Oh, I have no time to make experiments." Now, if he has no time to improve, he ought to have sufficient business of the old kind to prevent him grumbling. Does he not lay himself open to having it said of him that he waits for the amateur to invent improvements for him? But it is not every photographer who is equal to taking up changes, even when he sees they will pay him.

And now for the picture-maker.

I cannot help thinking that, even in the best art photography can produce, we want a little shaking up, and, if not a change in our methods, at least some variation in our choice of subjects. But don't let me be misunderstood on this point. We have "wallowed in the pathetic," as Tom Sawyer did in Sunday schools, for several years, and a wonderful deal of good has been done by showing photographers that true poetry can be infused into their work, but the effect has been so good that everybody is now imitating it, not always with success, and dreary effects have become more monotonous than practical. It is misusing poetry, and making it too cheap, to put a bad

mitation into every little picture. As Wordsworth prophetically says,—

"In this mortal journeying wasted shade
Is worse than wasted sunshine."

We have used up a good deal of sunshine in photography from first to last; let us try it again under altered circumstances, let us try for a year at least. The Greeks recognised that art to be serene, joyous, beautiful, was also its highest strength, and, as Corot used to ask, "What's the use of an art that does not make us gay?" for, as Coventry Patmore sings, "a cheerful heart is what the muses loved."

Some of our fashions are dying out. Radiography is rapidly becoming uninteresting as a side show, and is sent off to the hospital; and there are those who complain that the lantern hurts their eyes. When audiences are assured of this, what will hon. secretaries do to fill evenings? There will be no more excuse that the lantern slide connects the subject with photography when the lecturer takes us to the top of Mont Blanc. H. P. Robinson.

FOREIGN NEWS AND NOTES.

Incandescent Light and Gas Chimneys.—Dr. H. W. Vogel gives some particulars of a new incandescent gas mantle, and a new chimney, in the *Photographische Mittheilungen*. The new mantle gave the following results as compared with the Auer light.

Date.	Pressure.	Temperature.	Gas per Hour.	Intensity. Hefner Candles.	Gas per Hefner Candle.
New light, 15, 2, 1897.	47 mm.	12° C.	133·3 l.	95·74	1·393 l.
Auer light, 29, 9, 1895.	48 ,,	18° ,,	126·60 ,,	60·44	2·9 ,,

The new mantle not only gives more light, but is more economical, the consumption of gas per Hefner candle (=1·1 standard candle) being only about one-half. The new chimney is made by Schott & Genossen, of Jena, and is fireproof. Some minutes after the gas had been lit the chimney was sprinkled with cold water, and remained sound. A new feature in the construction is the arrangement for supplying air. At the height of the flame there are holes in the side of the chimney, and the gallery upon which the chimney rests is closed. Dr. Schott finds that the light is increased ten per cent. by this arrangement, but Dr. Vogel differs from him, and affirms, as the result of comparative experiments, that the amount of light is the same.

Light in Winter.—On page 149 we gave the result of some experiments by Dr. H. W. Vogel. On February 19 a further test was made by the same method. Time, three p.m. The intensity was equal to 573·58 Hefner candles. Compared with the highest January reading—394·5—the increase is nearly fifty per cent., although the February reading was taken half an hour later in the afternoon.

Photographic Copyright.—We read in the *Photographisches Wochenblatt* an account of a curious case recently decided in the German law courts. In the early part of 1894 Prince Bismarck gave Professor Lenbach permission to paint a portrait. A photographer named Halm was sent from Munich to Friedrichsruh to take a photograph of the Prince, and he was authorised to reproduce it for publication. Richard Bong, a Berlin publisher, had a copy of this photograph transferred to a wood block and engraved. This duly appeared in the illustrated paper *Zur guten Stunde*. Halm instituted proceedings against Bong, and the case turned upon the question "whether a wood-engraving produced in such a manner could be described as an independent work or only a mechanical copy." The Association of Photographic Experts took the latter view, but the defendant tendered a number of artists of reputation as witnesses, who contended that the engraving was an independent work. Their evidence was to the effect that the translation of tone into line engraving was an art, and not a mechanical copy. The Court decided in favour of the defendant, and the Judge held "that an engraving produced in the manner described was not a mechanical copy of a photographic work, but an independent artistic production, made with free use of a photograph. The editor of the *Wochenblatt* argues with considerable force against this decision, and asks for an alteration of the law. A photographer spends his time, money, and talent in taking a photograph, and a wood-engraver appropriates it; but, because the latter has exhibited skill in translating tone into line, the photographer cannot claim compensation for his skill in arranging the pose and lighting, and his ability in securing a characteristic picture.

Disinfection by Sunlight.—In the *Photographisches Archiv* it is mentioned that L. Mutschler, in an article on the waters of the Aar, at Bern, states that the bacteria are ten times more numerous below, than above, Bern. The bacteria of the waters of the Siel are destroyed in five hours in full sunshine, within a distance of twenty kilometres; but, as the sunshine is intermittent, and only at times of full strength, it is not of much practical value for the purification of rivers.

Halation.—According to Goderus, halation may be avoided upon any plate by stopping down the lens to *f*·200. The light is then so weak that it is unable to traverse the sensitive film. As the light does not reach the back of the plate, it cannot be reflected.

Toning after Fixing.—Dr. P. Michaelis, in the *Rundschau*, gives the following instructions for obtaining blue-black tones. The prints are carried somewhat beyond the usual depth, fixed, and then washed for five minutes. The toning bath is made as follows:—

Distilled water	300 c. c.
Alum	5 grains.
Citric acid	3 ,,
Sulphocyanide of ammonium	10 ,,

For each sheet of paper to be toned, 1 c. c. of a one per cent. solution of gold chloride is added to the bath. The toning solution must be warmed to 25 to 30° C., and it is therefore necessary to harden gelatine prints before using this bath.

The Artigue Process.—To those interested in this mode of printing, the following extract from Dr. Eder's recent volume on pigment processes may be of service:—According to Duchochois, a similar paper to the Artigue may be prepared by an easily soluble mixture of 20 c. c. syrup, 10 grammes sugar, 5 grammes honey, 10 grammes gelatine, and 450 c. c. water. The whole is dissolved by heat, filtered, and 150 grammes of lamp-black, previously rubbed fine in alcohol, are then added. The paper is brushed over with this solution, the surface equalised, and the sheets are then hung up to dry. The paper is sensitised by brushing over a two and a half per cent. solution of bichromate of ammonia, and after drying the exposure is regulated by a photometer. The print is developed in cold water with soft brushes.

COLLODION AND PYROXYLINE FOR COLOUR SCREENS.

If collodion films be employed in the formation of colour screens, much of the success will depend upon the selection of suitable materials, both as regards pyroxyline and solvents as well as the method of mixing them, and it is, no doubt, want of attention to these points that has caused many experimentalists to give preference to other media. In the first place, it is not every sample of pyroxyline that will give a sufficiently structureless film to transmit the light rays without distortion of the image or loss of clearness, and it is chiefly those kinds that are most useful from an ordinary photographic point of view that are worst in this respect. So-called "high-temperature" collodions are rarely suited to the purpose, as they have generally a tendency to dry with more or less opalescence, or, at any rate with a certain want of brightness that is easily noticeable against a surface of bare glass. They vary, too, very much in the matter of solubility and "body," the less soluble giving wavy or mottled films, while those possessing a higher degree of solubility give so thin a film that it becomes necessary to use a far larger proportion, and so a somewhat similar result is brought about.

Samples that are prepared at a lower temperature—such, for instance, as are suitable for wet-collodion purposes—have, on the other hand, a strong tendency to exhibit structure and to run into crapy lines that, though they may be scarcely visible in the uncoloured state, show very distinctly when any colouring matter is added, more especially if the film be a comparatively thick one. This tendency is considerably lessened by dilution, and may be often overcome in this manner, if the colouring matter be of a sufficiently soluble character to give the requisite depth of colour in an extremely thin film. But, as many of the colouring agents employed necessitate the use of a relatively thick film in order to give the necessary depth of tint, dilution of the collodion is not always an available remedy.

But amongst the samples of pyroxyline manufactured for non-photographic purposes, *i.e.*, neither for bath nor emulsion purposes—as, for example, for surgical use or for enamelling—it is often easy to select a specimen which, if properly applied, will answer all requirements in the most perfect manner. Such pyroxylines are usually of a very soluble character, dissolving to form a perfectly clear and transparent collodion, and, if used in anything like the proportions usual for photographic purposes, have a decided tendency to "structure." But such samples are of such a viscid or glutinous nature that they will bear dilution to a most remarkable extent, under which conditions the structure entirely disappears, and the film when dried upon glass is absolutely invisible, and can barely be felt when scratched with the finger nail. We have met with more than one sample of this kind of collodion that, when dissolved to the extent of no more than a single grain or a grain and a half to the ounce of solvents, has given as much apparent "body" as an ordinary "photographic" sample at six grains to the ounce.

After the selection of a suitable sample of pyroxyline, we have still the solvents to consider, as well as the proportions in which they are used. The chief point to be considered, so far as quality is concerned, is that both ether and alcohol should be as free as possible from water, as nothing tends more to produce "structure" than low-grade solvents. Methylated ether of sp. gr. 720 is easily obtainable, and is very cheap, but the methylated spirit of commerce contains far too much water to give perfect results, so that it is advisable to use pure, and as near absolute as can be obtained. The relative proportions of ether and alcohol will vary more or less with different samples of cotton, though equal parts may be taken as the standard, bearing in mind that excess of ether aids solubility in the case of a pyroxyline that is apt to give a badly flowing collodion, but, at the same time, tends in the direction of crapy lines. Excess of alcohol gives freedom from structure, and, with a properly soluble cotton, a limpid and easy-flowing collodion, which, however, is apt, by reason of its slow setting powers, to result in a wavy or uneven film. Wood naphtha, or commercial methylic alcohol, has been frequently recommended as a substitute for ordinary alcohol in collodion-making, and, for this particular purpose, would seem to be specially suitable on account of its more volatile nature and greater solvent powers.

If those who have tried collodion films for colour screens, and have not met with the success they expected, would try again, bearing the above remarks in mind, we are strongly of opinion that they would find such films far superior to either spirit varnishes or gelatine, It is possible that some form of celluloid varnish would answer as well if any of the makers would put such an article on the market.

PHOTO-ENAMELS.

[Read before the Richmond Camera Club.]

I HAVE the privilege this evening of claiming your attention on behalf of photo-enamels, a photographic process which I personally have found great pleasure in practising, and I can promise any amateur photographer taking up this work that he will find it most interesting and fascinating. I think there is no more beautiful process in the whole range of photographic manipulation; but, while recommending photo-ceramics to the consideration of amateurs for the interesting nature of the method of production and the beauty of the finished work, I must frankly say that it is *not* the easiest process in photography, and, while there is no special or serious difficulty to confront the beginner, the manipulations are extremely delicate, and success cannot be obtained by rough-and-ready methods. It is a process for experts and amateurs. In the hands of an experienced operator the process becomes simple and certain, but a beginner can make sure of experiencing many a thrill of hope and chill of despair fully sufficient to excite and sustain his interest in an apparently fickle and capricious process. It is, however, one of the advantages of the process that the cost of materials is insignificant; in fact, there are very few photographic processes in which you can have so much fun for the money. The enamel plaque is the only item of expense, and this need not be risked without a fair chance of success; the image can be cleaned off again and again, and need not be fired in until satisfactory. The loss to the unsuccessful amateur is, therefore, only more or less spare time and a lot of temper. With the busy professional photographer time is money, and, unless he can commence by giving the time necessary to thoroughly master the process, his results will always be uncertain, and the undertaking unprofitable. I have already said that the materials cost little, and the apparatus necessary is also on an extremely economical scale. Until the enamels are ready for firing there are very few articles, if any, required which would not be found in an ordinary photographic outfit. It is not absolutely necessary for a beginner to fire his own enamels, as they may be sent out to some professional enamellers who undertake this work; but a small gas muffle furnace is not a very expensive apparatus, and photographers taking up this work seriously probably prefer to fire their own.

What is a Photo-enamel?

Before describing the making of photographic enamels, I should like to direct your attention to the special qualities which distinguish these productions from photographs by other printing processes. The most obvious difference is the beautiful lustre of the surface of a good enamel, bright and clear, beyond any surface excepting that of a precious stone. This brilliancy has an artistic value, it illuminates and renders transparent the shadows of the print, so that richness and depth may be obtained without heaviness and opacity, and gives a longer range of tones to the image. The lights also appear bright and pure, and the half-tones possess extreme delicacy. Further examination reveals that the photograph, apparently so delicate, cannot be injured or removed by ordinary means. It is, in fact, vitrified by the great heat to which it has been subjected in the furnace, and it is amalgamated with, or sunk into, the partially melted surface of the enamel, and cannot be injured or destroyed unless the surface is broken up by force or remelted by fire, or dissolved by hydrofluoric acid. It is therefore as safe as anything of the kind can be from accidental injury. Further, the image is generally formed by powder made from one of the metallic oxides, and is not deteriorated by prolonged exposure to light. You may therefore be assured you have an image in the most permanent form possible. In the South Kensington Museum there is a fine collection of enamels, by Pettitot and other famous enamellers of the seventeenth century, painted with similar colours, and fired into the same kind of enamel—they are as fresh and brilliant as on the day they left the artists' studios. I think, then, it will be conceded that we have here an artistic product that reaches the highest standard of permanency, a photograph that is not deteriorated by the action of light, which is amalgamated with a substance that resists decay better than any other manufactured product, and the surface of which can be cleansed by water as freely as a dinner plate. These qualifications distinguish enamel photographs from all other photographic productions, and extend their use as jewellery and for other decorative purposes for which no other form of photograph is suitable.

When we come to consider the means by which a vitrified photograph may be made, we are at once confronted with a condition which forbids the use of any of the ordinary photographic printing processes. The image must be formed of some matter which is not combustible, and is not deteriorated by the great heat to which the enamel is subjected in the furnace. It must be formed of such matter, and of such matter alone, and there must be absolutely no other substance on the face of the enamel at the time of fusion except the material which forms the image. To glaze even a soft enamel it is necessary to bring it to a red heat, and this would reduce to ashes the composition of a photograph printed by any of the usual photographic processes. Even with an image which will resist heat it is, of course, useless to employ with it a vehicle which would burn away and leave an ash, such as gelatine and albumen or paper would surely do. It will then easily be understood that a photograph for vitrification cannot be printed by the albumenised silver process, or by the bromide, carbon, or platinotype processes, as the image in each case would be destroyed by fire, and also the vehicle in which it is held, whether that be albumen, gelatine, or paper, as either of these would, when burnt, leave an ash behind which would become imbedded in the melted surface of the enamel and ruin its purity.

As the firing is an insuperable bar to the use of the usual methods of photographic printing, it is clear that we must turn to some other method of photographically producing the image, and the powder process, which I shall presently have the pleasure of demonstrating before you, fulfils the necessary conditions in almost an ideally perfect manner. The image is formed of ceramic powder impervious to heat, and we manage during the manipulations to completely free it from the vehicles in which it is held at different stages of its production, and I shall show you that; when the enamel is ready for its final firing, there is absolutely nothing upon its surface but the powder forming the image, and which is to be fired into the body of the plaque.

Theory of the Process.

Before discussing the practical details of this process, let us clearly understand the theory upon which it is worked. What is required is that a sufficient quantity of ceramic colour, used in the form of a dry powder, shall be distributed over the surface of an enamel plaque in such a manner that it shall represent exactly and accurately, by the varying thickness of the deposit, the same gradations of tone as are possessed by the diapositive, by which its disposition is regulated. We proceed by preparing a hygroscopic viscid solution, a preparation that will readily absorb moisture, and which becomes sticky when moist, but which presents a hard surface when dry, to which powder will not attach itself.

Now, if we coat a glass plate with a solution of this nature, and dust a suitable black powder over it while moist and tacky, sufficient powder would adhere to this sticky surface to completely cover it in a thick layer, and you would have the plate coated over with a dense even deep black colour, such as you require in the heaviest shadows of a picture only. Again, if instead of dusting powder over the plate while it was sticky you

lowed it to dry hard and prevented it absorbing moisture from the mosphere, the surface might be covered with dry powder, but the hard rface would not secure it, and it would all dust off without leaving an om behind.

Now, clearly, what we require is, that our film shall take up moisture in discriminating manner: that it shall become very moist and tacky here the picture should be dark, so that a thick layer of powder shall there to it in those parts to form the shadows of the picture: that it all be not so moist and sticky in the half-tones, so that less powder will there to form the lighter parts of the picture, and that it will be less sorbent still in the high lights, so that it will reject the powder together; practically that it shall absorb moisture in every part in act proportion to the depth of tone required. We are luckily able to ve our preparation this discriminating power in a most beautiful and rfect degree, photographically, by sensitising it with potassium ichromate.

If then solution of potassium bichromate is added to our hygroscopic reparation, it becomes sensitive to light, and its characteristics are ltered in one particular which is of extreme importance to our purpose. ntil exposed to light, the bichromate has no effect on the preparation, ut, if exposed sufficiently to light, it completely robs it of its power of bsorbing moisture, and causes it to become in fact non-absorbent and nsoluble, and therefore incapable of becoming sticky and causing the dherence of powder. We *now* have a surface that will absorb moisture n the inverse ratio of the proportion of light it has received, that is, it ill be non-absorbent where it has received the fullest exposure, and t will absorb moisture readily where it has been completely protected rom the light, and less readily where only partially protected.

If now this sensitive preparation is exposed under a diapositive, the parts lying under the thinnest parts of the positive will receive the most ight and become less absorbent than those parts which are protected nore fully by the shaded parts of the positive, and which therefore eceive less light and retain more of their original power of absorbing noisture.

When printed, we have the lights and shades of the positive represented by the more or less absorbent character now possessed by the preparation, ess absorbent in the lights, more in the shadows, and as we know the preparation will become sticky in proportion to the quantity of moisture t is capable of taking up, and that the stickiness regulates the amount of powder that will adhere, we have now only to brush powder over the surface of the preparation, and it will adhere in the exact proportion required o form an image with the same gradation as those possessed by the liapositive beneath which the preparation was exposed.

Preparation of the Plate.

We will now attempt to show you the actual preparation of a photo-enamel by the powder process as far as we are able with the facilities at our command. But I should like to forestall criticism by reminding you that this is an extremely delicate process, and that we are away from our own laboratories and convenient working, with make-shift arrangements, and do not feel confident of the success we can command under our usual working conditions.

Take a glass plate and clean it very carefully; it is necessary that the surface used is quite free from dirt, or, later on, when you attempt to transfer the image, it may not leave the glass freely. Give the side about to be used a final dust with a camel's-hair brush and coat with the sensitive solution already prepared in the same manner as you would coat a plate with collodion or varnish a negative. Set it to dry on an iron plate heated by a stove beneath. It may be observed that the conditions under which the plate must be coated are not very exacting. Provided that the solution covers every part of the plate to be printed, it does not matter how thin it is or how thick; or it may be thick at one side and thin at another without affecting the result. It may also be dried very slowly or very rapidly, using considerable heat provided there is not sufficient used to burn the preparation. Great care, however, must be taken that it is not allowed to absorb moisture until after it is printed and developed, and to prevent any risk of this occurring it is a useful precaution to keep it slightly warm until it is safely in the pressure frame.

While the plate is drying we will consider the dianositive or transparency from which the image is to be printed, and I would draw your attention to the fact that the image must be printed from a positive.

This is the only photographic process I know in which a positive image is printed from a positive, and in which a negative would print a negative image. The reason of this is apparent when it is remembered that it is the parts of the sensitive preparation that are most shielded from the light, viz., the shadows of the transparency that will retain in the greatest degree their original quality of absorbing moisture, and by this means form an adhesive surface to which the powder will cling. In the more transparent parts, the lights of the positive, this quality will be partially or wholly destroyed, and they will retain less or more of the powder brought in contact with them. The simplest way of producing a suitable positive is on a dry plate, developed in the same manner as a negative. It can be exposed by gaslight in contact with the negative if the image is required to be same size as the original; if it is required reduced or enlarged, it must, of course, be exposed in the camera. I find that a well-exposed, rather thin quality gives the best result, as the brilliancy of the powder print made from it can be increased by a full exposure. A strong positive is apt to give a harsh powder print. Any modifications required by the subject can be conveniently and easily done on this positive, as any alterations made upon it will appear not reversed, as retouching on a negative shows upon a print, darkened parts printing lighter and lightened parts darker. If a vignetted image is required, it should be vignetted in making the positive. The background can also be darkened by a coat of matt varnish, or any parts altered or modified by skilful retouching with pencil or brush. Having prepared the positive, the next operation is to mix the solutions for coating the plate.

There are many formulæ published, and a good preparation for beginners will be:—

Dextrine	3 drachms.
Honey	4 „
Albumen	6 „
Glucose	1 ounce.
Water	10 ounces.

This is the hygroscopic mixture, and should be sensitised by adding equal parts of a cold saturated solution of potassium bichromate. It is better to mix the sensitising solution separately, and to only sensitise sufficient of the preparation to last for a few days, as the solutions are apt to deteriorate when mixed. The sensitive solution should be filtered before using, to eliminate any particles of dust or dirt that may have found their way into it with mixing.

Printing.

The plate, having been coated and dried, is ready for printing. It will be observed that, while perfectly dry and warm, it has a smooth, shiny, hard surface, but it must be remembered that, until acted upon by light, it will avail itself greedily of any chance of absorbing moisture from the air or anything with which it comes in contact. It is advisable to warm the positives before bringing their surfaces into contact, or the sensitive plate may stick to it and be spoilt. A comparatively short exposure only is necessary, about five minutes in good summer light being an average allowance; but, as it is important to hit off the exposure with exactitude, and there is no way of ascertaining accurately by the appearance of the sensitive surface before attempting to develop whether exposure is correct, it is best to use an actinometer, so that, if on the first trial the exposure is found to require modification, a tint less or more may be given for the second trial.

Unfortunately, daylight or good electric light is not available this evening, and I propose to make a couple of exposures with magnesium ribbon, if you are willing, for the sake of the experiment, to endure the fumes of the burning magnesium.

When fully exposed, an image is faintly visible on the surface of the plate, but it is hardly possible to judge by inspection whether the exposure has been properly timed, the image is not sufficiently distinct for this purpose. After exposure, the plate should be taken from the printing frame and slightly warmed, in order to expel any moisture it may have collected during printing, also that it may, as it becomes cold, absorb moisture from the air gradually, so that it may develop or take up the powder in an orderly and regular manner.

It is, of course, necessary, in order that the less exposed parts of the image shall become moist and tacky, that there is sufficient moisture in the air for them to absorb. The condition of the atmosphere is therefore one of the factors to be considered. In a warm, dry atmosphere, the plate, even before any parts were exposed to light, would not become sticky, and therefore would not be able to attach to itself any of the powder dusted over it. When this occurs, we generally get over the difficulty by sprinkling water on the floor, and so moistening the air artificially. In cold, damp weather we sometimes reach the other extreme. There is so much moisture that the plate damps all over, and, in spite of the hardening influence of light, the parts exposed which should remain pure attach powder to themselves as well as the shadows, and you have a fogged, dark image. The remedy is, of course, to dry the air of the room in which you develop.

Development.

The plate having been printed and slightly warmed, it is ready for development with the powder. It will be found best to keep the ceramic powder on a sheet of glass, and, if a sufficient quantity is put on a 15 × 12 plate in a 15 × 12 cardboard plate box, to catch whatever powder runs off the edges, this will prove a convenient arrangement. Hold the plate at one corner, lodge the end on the glass bearing the powder, and sweep enough powder on to it with a soft camel's-hair brush to cover the whole of the part to be developed. Shake the plate to keep the powder upon it gently moving over its surface. The progress of the development should be watched carefully, and from time to time the powder should be tipped off and the camel's-hair brush passed lightly over the surface of the plate, to remove particles of the powder that have not adhered. If the exposure has been correct, the development should begin slowly, and proceed in an orderly and regular manner until full depth of tone is obtained.

If the plate is under-exposed, the surface will be too absorbent, and will become sticky, and seize the powder more or less over the whole of its surface, so that you will get a flat, foggy image, with insufficient

distinction between its tone. It will develop very rapidly, and be weak and poor when sufficiently advanced for the lights to show full detail, and dark and foggy all over if development is carried far enough to get sufficient strength in shadows. If the plate is over-exposed, it will only take up moisture in the shadows, and will remain hard in the lights. It will develop very slowly, and will give a harsh, hard print, strong in the shadows, and void of detail in the lighter tones. The development of the image being completed, give it a final dust over with the camel's-hair brush, to free it from any loose particles of powder, and it is ready for transfer.

We have now an image formed of matter that can endure the heat of the furnace without injury, but it is adhering to a preparation which cannot be fired, and of which we must therefore get rid. In order to do this, we coat the plate with thin collodion, so that the powder image is now between two films, the sensitive preparation holding it beneath and the collodion grasping it from the top.

Stripping the Film: the Plaque.

The collodion forms a film over the top of the image, and takes such a good hold of it that we can now dispense with the sensitive preparation which adheres to the under surface of the powder together with the glass plate supporting it.

The sensitive preparation is easily soluble in water, so we have only to immerse the plate in water to dissolve away the preparation, and leave the collodion film floating free, bearing the powdered image on its surface. There are one or two observations to make on these operations. The most suitable collodion film is made by a good enamel collodion diluted.

Care must be taken not to use the collodion too thick, or, as soon as the film is submitted to a gentle heat, it will split and crack the image into minute sections.

The image on the collodion film should be pure and white in the high lights. If it appears yellow in parts, it is stained by the potassium bichromate, and the stain must be removed, as it will not fire away. The best way to remove this stain is to immerse the image for a short time in a bath of caustic potash (strength, one ounce of caustic potash to fifty ounces of water). This can be done after it is in position on the plaque. After the caustic potash bath, the print should be well washed in gently running water.

The collodion film released from the glass plate is left floating upon the surface of the water with the powder image on the underneath side. It should now be turned over, so that the image is on the uppermost side, and the enamel can be brought into contact with it from beneath. This is a somewhat delicate operation, as the film is extremely thin, and will ruck up and ruin the image if handled roughly. The powder upon it is attached very lightly, and is as easily displaced as the down on a butterfly's wing. From this stage of the manipulations onward, until it is actually fired into the enamel of the plaque, it must not be touched or handled, however lightly. The best way to turn the film is to cautiously reverse it with the help of a small camel's-hair pencil. The film being safely turned over, with the powder on top, the enamel plaque to which it is to be transferred is brought under it, and is gradually raised until the surface of the plate is in contact with the under side of the film. The plaque and film are then raised out of the water. The film is always made larger than the plaque, and, when they are withdrawn from the water, the loose ends of the film wrap round the sides of the plaque, and keep the film from slipping out of the position in which it has been placed. We now have the image placed in position on the enamel into which it is to be fired, and are a stage nearer our goal. We have not yet, however, wholly dispensed with the vehicles for holding the image, but have only exchanged the sensitive solution for a collodion film. There is, however, this important difference in our favour between the two supports, the materials composing the sensitive preparation, if exposed to heat, would frizzle away, and cause a disruption of the image, and would, besides, leave an ash behind, but the collodion film, under a gentle heat, will fire off completely, and leave no trace of its existence.

Our next operation is therefore to free the enamel plaque from the collodion, and, in practice, it is generally slowly roasted off before the mouth of the furnace. Care must be taken not to subject it suddenly to too great a heat, or it will split and fly off the plaque, carrying the powder image with it. Subjected to the right temperature, the film scorched by the heat first becomes brown, and, gradually darkening over the whole of its surface, becomes so black as to wholly obscure the image. The heat may then be gradually increased until the colour slowly disappears, leaving the powder freed from all traces of the collodion. We then have the powder image absolutely freed from any vehicle or support used in its production, and may proceed to the final firing with no matter present but the ceramic powder forming the image, and the plaque into which it is to be fired.

Firing the Image.

I am sorry that I am not this evening in a position to complete my demonstration by showing you the actual firing of the plaque, as it is not practicable to have a furnace here, but I can assure you that this final operation is quite simple.

A *muffle* furnace is used; that is, a furnace in which a flame from gas or coke plays round an inner chamber or muffle, in which the plaque is placed. The furnace should be lighted a short time before firing commences, so that the whole of the interior of the muffle appears to be of a dull cherry heat. The enamel should be placed on a small fireclay brick (such as can be easily made by mixing up a little ordinary powder fireclay with water, and moulding to size required), and introduced into the muffle.

The plaque should now only be fired very lightly, with just sufficient heat to attach the colour to the surface. It should then be withdrawn and carefully examined for defects, and, if any spotting or other brush work is necessary, it should be done at this stage, using a little of the powder ground up with oil of lavender. It can then be returned to the furnace for final firing.

After it has been allowed to remain in the furnace for a few minutes with the doors of the muffle closed, it should be watched carefully, so that it may be removed immediately it is satisfactorily glazed. As soon as it appears to be glazed, it should be removed from the furnace and carefully examined, and, if the shadows are not fully glazed, it can be returned to the furnace again. The plaque may be withdrawn from the furnace and returned again time after time without injury, and it is best for a beginner to proceed cautiously and examine frequently, especially as there is not much margin between a brilliant glaze and over-firing. If the enamel is subjected to too great heat or a prolonged firing, the effect is ruinous. The image sinks too deeply into the opaque enamel of the plaque, and appears to be covered with a bluish-white film, and it is spoilt without redemption. The state of the glaze can be judged with accuracy by an experienced operator without withdrawing the enamel from the furnace by holding over it a piece of hard wire. If the reflection of the wire on the surface of the enamel is bright and regular, the plaque is fully glazed; but, if the reflection is bright only in the lights and dull in the shadows of the image, then the plaque requires further firing, in order that the shadows may be glazed. The lighter tones, *i.e.*, the parts with less powder, fire quickest, and the deeper shadows, *i.e.*, where the powder is thickest, requires the most firing.

I have now described the production of a photo-enamel from the making of the transparency to the final firing; but, before I conclude my lecture, I think it might be of advantage to you if I describe rather more fully the apparatus and material used, and tell you where they may be obtained.

The Apparatus and Materials.

The enamel plaque is made of a thin sheet of copper, bent to a slightly convex shape, coated with soft white opaque enamel, which is applied to the copper in the form of powder, and vitrified in the furnace. The enamels I have shown you to-night are of French manufacture, and are of a better quality than we have been able to obtain elsewhere; but Penrose and Co., of Upper Baker-street, supply very suitable enamels. If any one of you would like to try his hand at making his own enamels, I would refer him to a very complete description of their preparation, given by Mr. A. Haddon to the London and Provincial Photographic Association in 1893. A reprint from the report of this gentleman's lecture will be found in Ethelbert Henry's *Photo-ceramics*, a book I would recommend to your notice also for a great deal of useful information on photo-enamels.

The colours used are those prepared for painting on pottery and glass, and require grinding very finely. They may be obtained from Hancock & Son, of Worcester; Emery, of Cobridge, and many other china colour makers. I have found that many of the colours I have tried are unsuitable, and cannot be got to adhere in sufficient quantity to the sensitive preparation. I am not certain of the reason of their unsuitability, and will not trouble you with unproved theories, but I may remark that blacks, and browns, and reds generally work easily; white, blues, and yellows do not.

I consider that for small enamels a gas-muffle furnace is much the best form. The heat is more under control than with coke, and it is cleaner. Fletcher, Russell, & Co., of Warrington, make a very convenient gas furnace for a few pounds, which they originally introduced for the use of dentists.

I have confined my remarks this evening exclusively to enamel, but a photograph may be produced on a glazed tile, or any china ware, or on glass, or any enamelled or glazed surface, in precisely the same manner. The only precaution to be observed is that the powder with which the image is formed must be suitable to the glaze of the ware on which it is to be transferred. Many powder colours are only adopted for soft glazes, such as melt at a comparatively low temperature. These colours would deteriorate if subjected to the terrific heat required to melt a hard glaze. Again, many hard glaze colours do not fire true until a heat is reached that would sink the image beneath the opaque body of a soft glaze. The colour must be suited to the glaze, or the glaze to the colour.

I have been engaged for a considerable time in conducting a long series of experiments, with the object of perfecting a process, for the decoration of china and other glazed and enamelled surfaces, in a manner that would not be so costly as the powder process I have been describing, and I hope very shortly to be able to bring photography into use for this purpose in a very cheap form, so that it may compete commercially, while being very greatly superior artistically, to the copper-plate and lithographic processes now in use. I am confident that in the near future photography will play as great a part in the craft of the potter as it already has in that of the printer. I hope to have the privilege on some future occasion to go into the subject more fully with you.

Ernest C. Morgan.

SUBJECTIVE COLOUR PHENOMENA.

[Nature.]

In a recent communication to the Royal Society,* I described a series of optical experiments which originated in an attempt to account for the colour phenomena exhibited by Mr. C. E. Benham's "Artificial Spectrum Top" (*Nature*, vol. li. p. 113). The chief of these experiments are of an exceedingly simple character, and can easily be repeated without the employment of any special apparatus. They demonstrate the formation, under certain conditions, of transient bands of colour along the boundaries between light and dark surfaces.

Let a hole, half an inch square, be cut with a sharp knife in the middle of a sheet of thick brown paper about fifteen inches square. The hole is to be covered with gummed white paper taken from the edge of a sheet of postage stamps ("stamp paper"); a small translucent window is thus formed. Across the middle of the window a common pin is to be fixed, like a bar, by means of narrow strips of stamp paper at its two ends. Holding the brown paper in the left hand between the eyes and a lamp, the observer directs his eyes upon the translucent window; then he conceals it from view by interposing a screen, such as a thin book with a dark cover. After a few seconds, and without moving the eyes in the mean time, he suddenly withdraws the screen; then, if everything is right, and the observer is not unaccustomed to subjective visual experiments, the window will, for a moment after its exposure, appear to be surrounded by a narrow red border, while the pin also will at first appear bright red, not turning black until after the lapse of about one-tenth of a second. The effect is seen best when the lamp is at a certain distance from the brown paper. This distance must be found by trial; in my own case an eight-candle power lamp gives good results when it is about twelve inches behind the paper. The observer's eye should be ten or twelve inches away from the translucent window.

When once the red border has been detected, it becomes very conspicuous, the difficulty in the first instance being not to see it, but to know that one sees it. The phenomenon is, without doubt, constantly met with, and habitually ignored, in daily life. Since my first observation of it I have many times noticed flashes of red upon the black letters of a book or upon the edges of the page; bright metallic or polished objects often show a red border when they pass across the field of vision in consequence of a movement of the eyes, and it was an accidental observation of this kind that suggested an experiment like the following:—

Holding the brown paper between his eyes and the lamp, as before, the observer moves it rather quickly either up and down, or round and round in a small circle an inch or two in diameter. The moving window will, owing to persistence, form a straight or circular luminous streak, which will appear to be bordered on both sides with bright red. No person, however unpractised, to whom I have shown this experiment, has failed to see the red border at once. As before, the intensity of the illumination must be properly regulated; so also must the speed of the movement. With strong illumination the red border is very narrow, and is lined with greenish-blue, or the red colour may even be altogether absent.

The above experiments show that, when a luminous image (not too bright) is suddenly formed upon the retina, it appears at first to be surrounded by a red border.

The following is a way of showing the same effect by reflected instead of by transmitted light. Two or three black lines, about as thick and as long as an ordinary pin, are drawn upon a small piece of white paper, which is placed upon a table and illuminated by strong lamp light (not daylight). A black book is interposed between the observer's eyes and the paper, and then very suddenly withdrawn; the lines, when first seen, appear to be red, quickly changing to black. So far the observation is a rather difficult one, but by a very simple device it is possible to obliterate the image of the lines before the redness has had time to disappear; the colour then becomes easily perceptible. A thin black book is held horizontally in the right hand by its left-hand bottom corner, the thumb being uppermost; between the thumb and the book is inserted the right-hand bottom corner of a sheet of white note paper; the upper right and left corners of the paper and the book respectively are separated, so as to form a triangular open space between them. The book is held an inch or two above the black-lined paper, covering it completely; then the hand is quickly moved from left to right in such a manner that the lines are for a moment exposed to view through the gap between the book and the note paper, the movement being stopped as soon as the lines are covered by the paper. During the brief glimpse that will be had of the lines while they are beneath the gap, they will, if the illumination is correct, appear to be of a brilliant red hue. It must be ascertained by a preliminary trial that neither the book nor the note paper casts a shadow upon the black lines when the gap is passing over them.

By a further simple contrivance the red images may be made visible almost continuously for an indefinite time. Upon a disc of white cardboard, from 3½ to 6 inches in diameter, two straight lines are drawn from the centre to the circumference, containing an angle of about 45°; the portion enclosed by the lines is cut out nearly up to the centre, a rim about ¼ inch wide being left at the circumference; the remainder of the disc is divided into two equal parts by a straight line from the centre to the circumference, opposite the opening, and one of these parts is painted black with ink. A pin is passed through the centre of the disc in such a manner that the unprepared face of the disc may rest upon the pin's head (a lady's hat pin is better for the purpose than a small one); the pinhole must be sufficiently large to allow the disc to turn freely. Holding this arrangement by the pointed end of the pin (which should be directed vertically upwards) above a design in black lines upon a white ground—any drawing, writing, or printing, will do, provided that the lines are not too thick—the observer spins the disc by striking its edge tangentially with his finger in the direction such that the gap follows the black portion, and is followed by the white portion of the disc. If the disc makes five or six turns per second, and the before-mentioned precautions as to illumination and shadows are duly observed, the black lines of the design, seen through the opening in the disc, will appear bright red, and, owing to persistence, the impression will be almost continuous.

When the disc is made to turn in the reverse direction, the lines appear to become (subjectively) blue instead of red. This appearance is partly, if not altogether, illusory. Careful observation shows that the subjective blue tint is not formed upon the lines themselves, which remain black, or rather grey, but upon the white ground just outside them. This and other experiments detailed in the paper indicate that, when a dark patch is suddenly formed upon a bright ground, the patch appears for a moment to be surrounded externally by a blue border.

We have, then, to account for the two facts, that in the formation of these transient coloured fringes the red originates in a portion of the retina which has not been exposed to the direct action of light, while the blue originates in a portion which is subjected to steady illumination. The effects must, I think, be attributed to sympathetic affection of the red nerve fibres. When the various nerve fibres of the Young-Helmholtz theory are suddenly stimulated by ordinary white or yellow light of moderate intensity, the immediately surrounding red nerve fibres are for a short period excited sympathetically, while the violet and green are not so, or in a much less degree; and again, when light is suddenly cut off from a patch in a bright field, there occurs an insensitive reaction in the red fibres just outside the darkened patch, in virtue of which they cease for a short time to respond to the luminous stimulus, in sympathy with those inside the patch. The green and violet fibres, by continuing to respond uninterruptedly, give rise to the sensation of a blue border. There is reason to believe that with intense illumination, such as sunlight, these effects are reversed, the sympathetic affection of the red fibres being in such case less than that of the green and violet instead of greater.

The above-mentioned are a few among many curious phenomena which exhibited themselves in the course of my experiments. It appears probable that a careful study of the subjective effects produced by intermittent illumination would lead to valuable results, tending to clear up many doubtful points in the theory of colour vision.

SHELFORD BIDWELL.

* "On Subjective Colour Phenomena attending sudden Changes of Illumination," *Proceedings Royal Society*, December 17, 1896.

COLOUR PHOTOGRAPHY: BRASSEUR AND SAMPOLO'S PROCESS.

HERETOFORE, say the patentees of this process, in producing printing surfaces for this purpose, it has been customary to make three several negatives of the object by sifting the light therefrom through or by means of three several monochrome screens. To the eye these screens are respectively yellowish-green, violet-blue, and reddish-orange, though no fixed shade or tint of these colours is universally employed, for each operator appears to select these colours according to his judgment. From the three negatives made as described, each of which differs from an ordinary negative of the same object only by the suppression of the action of certain wave-lengths or light of nature, the separate printing surfaces are made in several well-known manners. The printing surfaces may be of gelatine or half-tone plates, or the like, and from them impressions are taken in yellow, red, and blue inks upon paper, say, the impressions being superposed in register. By the superposition of these colours, or some of them, in certain parts of the picture, the various mixings and shadings of colours are produced.

In the accompanying drawing—

Fig. 1 is a face view, illustrating a parti-coloured screen, T, ruled in lines.

Fig. 2 is an enlarged or detail view of part of the screen shown in fig. 1.

Fig. 3 is an edge view of the screen, T, and a plate having a sensitive film, N, thereon.

Fig. 4 is a diagrammatic view showing the film, N, and screen, T, in a camera in readiness for exposure to take a photograph.

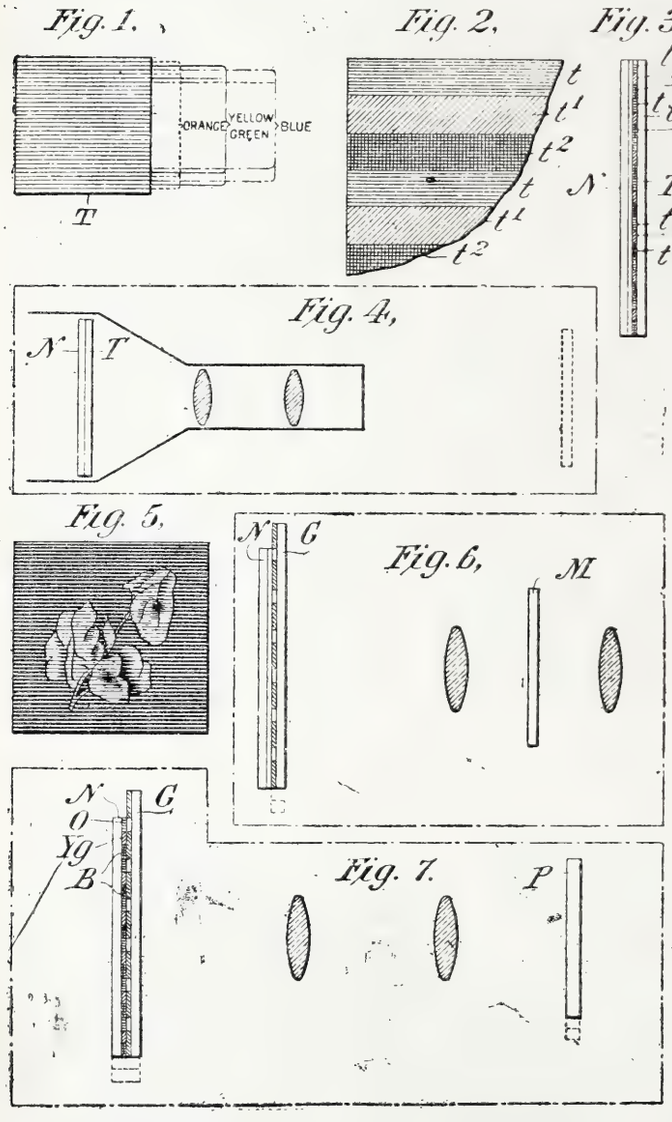
Fig. 5 is a view illustrative of the appearance of a photograph taken through a screen, T, or by the method illustrated in fig. 6.

Fig. 6 is a diagrammatic view showing how a photograph may be made in a camera by the use of an opaque and transparent screen, G, and monochrome screens; and

Fig. 7 is a like view illustrative of our method of forming a photographic print from any one of differing partial images forming a photographic representation of an object.

According to our invention, we employ but one negative of the object, whether nature or artists' work, and we proceed as follows: A sensitive film, N, sensitised as far as may be for the visible rays of the spectrum, is exposed under and in close contact with a taking screen, T, having minute, closely adjacent or adjoining areas of transparent colours of the required or desired light-selecting absorption powers. These minute areas of colours on the taking screen may be of irregular shape and be irregularly distributed thereon, but we prefer to have these minute areas in the form of straight parallel lines, t, t^1, t^2, running, say, 200 or more to the inch; or they may be in the form of dots or geometrical figures. Every third line, t^1, or area, is a transparent yellowish-green colour; every third line, t^2, again, is of a transparent violet-blue colour; and every third line, t, again, is of a transparent reddish-orange colour. It will be observed that these lines correspond in colours to the monochrome screens above described in conjunction with the old processes.

The subdivided negative may also be formed as follows: A screen, G,



ruled in black (opaque) and white (transparent) lines with the black lines at least twice as wide as the white, may be laid upon the sensitive film with its ruled side there-against, and the whole be placed in a camera with a screen towards the lens. The screen, G, is movable upon three successive positions, and exposures are made for each of said positions, three several monochrome screens (yellowish-green, violet-blue, and reddish-orange, respectively), being used separately and successively one for each of said positions. The subdivided negative thus formed is similar to the subdivided negative formed under the parti-coloured screen above described.

From the subdivided negatives so made (or made from a subdivided positive), we may form separate or independent printing surfaces, one from and for each partial image, using the black-and-white screen, G, above described. This screen, G, is so arranged relatively to the linear areas of the negative that the opaque lines thereof cover or stop out two of the partial images as by lying parallel to, over and in contact with the linear areas of the negative containing them, while the white lines expose the third partial image. We place a sensitive film in contact with the negative or screen and expose in the well-known manner to obtain the print; in this case the light may be diffused over the sensitive film by the screen, and the print thus made be practically continuous (that is, not to be separated into linear areas by blank spaces). We prefer, however, to place the screen, G, and negative and the sensitised film in an enlarging and reducing or other camera (see fig. 7), and expose the film therein to make the print; in this case, the negative and screen and the plate carrying the sensitive film are in parallel planes, and the negative and screen, or the plate carrying the sensitive film, or both, may be moved upon three successive positions in the plane or planes thereof in a direction preferably at right angles to the black-and-white lines of the screen, to expose new or additional areas of the print film to the action of the light from or through the exposed partial image; that is to say, the exposed partial image appears on a focussing plate as in a series of lines separated by blank spaces; of course, the actinic action in the sensitive film is practically confined to similar lines; if it is desired to have the print occupy more than the areas of the lines the relative motion of the parts is employed to expose new or additional areas of the print film.

It is obvious that prints for and from each partial image of the negative may be made in a like manner. Instead of the relative motion of the print film and the negative and screen, we may expose all or the desired parts of the print film to the action of light from or through the exposed partial image by having the print film very slightly out of focus. From the positive partial images so obtained we proceed by any suitable or usual and well-known method to produce the required printing surfaces or blocks. The reference letters, O, Yg, B, indicate the linear areas of the photograph which respectively correspond to the lines, t, t^1, t^2, or the monochrome screens of corresponding colours.

We may also proceed as follows in forming the partial positives from the sub divided negative: After developing the negative, we may place the taking screen upon it with the green lines thereof over and in contact with the areas of the negative formed under such lines, and so of the other coloured lines of the screen and the corresponding areas of the negative. We proceed, either by contact printing or by means of a camera, to form the separate positive images, interposing, however, between the sensitive film and the light a general or monochrome screen, a separate one for each partial image. Thus, if a positive corresponding to the red rays from the object originally photographed be desired, the general screen so interposed, combined with the taking screen, should only permit, so far as may be, the passage of light or wave-lengths through those areas of the negative formed and lying under the yellowish-green lines of the screen. Similarly, other general or monochrome screens are employed singly in conjunction with the taking screen when obtaining partial positives corresponding to the other colours.

It is obvious that, in forming the positive partial images as above described, we may employ the well-known lined or cross-lined screens commonly used in the half-tone processes, so called; or the use of the latter screens may be deferred to a subsequent step in the operation of forming printing surfaces.

It is not to be understood that our invention is limited to the production of partial positives from a subdivided negative, for we may form a subdivided positive from the subdivided negative, and from such positive form partial negatives by the method above described, wherein the black and-white screen is employed, the procedure being the same, and the result differing only in that we obtain partial negatives instead of partial positives. From such partial negatives we may obtain printing services in any of the usual and well-known ways. We may employ, if we so desire, at any suitable stage, the lined or cross-lined screens commonly used in the half-tone processes so called. As in the case of the sub divided negative, we may proceed as follows in forming the partial negatives from the subdivided positive: We place upon the subdivided positive a screen subdivided into differently coloured areas corresponding to and registering with those of the positive, as in the fundamental colours of the spectrum—red, green, and blue-violet—interpose between the sensitive film and the light, general or monochrome screens of such nature that two of the partial images of the subdivided positive will be stopped out, while the light will pass through the general screen, the subdivided screen, and the remaining partial image of the subdivided positive to the sensitive film. Different coloured general screens are employed to obtain the different partial images.

Since the work of forming the partial positives or partial negatives can be done in the photographic studio or indoors, it is practically one and the same thing whether one employs the black-and-white screen or the parti-coloured screens and the monochrome screens to stop out the partial images, for in the latter cases light only penetrates the combined screens in the desired places, and is stopped elsewhere, just as with the black-and-white screen.

While the case of a photographic subdivided representation (positive or negative) composed of three differing partial images has been taken as an example, it is not to be understood that the invention is confined to such a case, for in some cases but two colours are wanted, as in "mounts" for microscopes, and in other cases more than three colours are wanted; in these cases, the taking screen above described may be ruled or covered with two, or more than three, transparent colours, and

e black-and-white screen would be ruled or covered in a corresponding nner.

Again, while a black-and-white screen is above described, instead of black opaque areas, one may employ areas which merely retard the action light in such wise that the light passing through the white areas will ve finished its work before the light through the retarding or obscuring eas will have had time to injuriously affect the sensitive film.

In those cases wherein the transparent tints or colours are placed on e taking screens in equal areas, the opaque and transparent screen (or e equivalent described) may be used in obtaining prints from all the rtial images; when the said areas of the taking screen are not equal, separate black-and-white screen for each partial image may be required such screen is used.

The claims are :—

1. In the manufacture of printing surfaces for colour printing from a otograph of nature or artists' work, the process above described of aking a subdivided photographic representation composed of differing rtial images in side by side areas of the representation, then pro-cing photographically a separate partial print for and from each partial age, from which partial prints, printing blocks, or surfaces, may be tained.

2. The process of forming a photographic print from any one of differ-g partial images, constituting parts of a subdivided photographic presentation of a multi-coloured object, and formed or lying in side-by-le areas of the representation, which consists in forming a print of the sired partial image by means of the action of light from or through the osen partial image, and through a screen having side by side areas spectively light-retarding or opaque and light-transmitting, the trans-tting areas thereof exposing the chosen partial image, and the retard-g or opaque areas thereof obscuring or stopping out the remainder of e said partial images during the printing.

3. The process of forming a photographic print from any one of fering partial images, constituting parts of a subdivided photographic presentation of a multi-coloured object, and lying in side-by-side areas the representation, which consists in forming a print of the desired rtial image by means of the action of light from or through the chosen rtial image, and through a screen having side-by-side areas respec-ely light-retarding or opaque and light-transmitting, the transmitting as thereof exposing the chosen partial image, and the retarding or aque areas thereof obscuring or stopping out the remainder of the d partial images during the printing, and in causing relative motion the image bearer and screen, taken as one, and the print film during printing, to expose new or additional areas of the print film to the ion of the light, from or through the said partial image.

4. The process of forming a photograpic print from any one of differ-partial images constituting parts of a subdivided photographic presentation of a multi-coloured object, and lying in side-by-side areas the representation, which consists in exposing a sensitive film to the ion of light, from or through, one of said partial images, and in pping out the remainder of the said partial images.

5. The process of forming a photographic print from any one of fering partial images, constituting parts of a subdivided photographic presentation of a multi-coloured object, and lying in side-by-side as of the representation, which consists in exposing a sensitive film the action of light from or through one of the said partial images, in pping out the remainder of the said partial images, and in causing tive motion of the image bearer and screen, taken as one, and the nt film during the printing, to expose new or additional areas of the nt film to the action of the light, from or through the said partial age.

"DRY MOUNTING" PATENTED.

ofessor Delépine, of Owens College, Manchester, has patented some provements in and relating to the mounting of photographs and other tures.

he Professor says: "It has hitherto been found difficult to properly unt photographs and other pictures on account of the presence of air bbles and through the picture not thoroughly adhering to the mount round the edges.

My invention consists in coating the material used for the mount with in layer or layers of a solution of gelatine or other allied substance ubstances having the same property for this purpose. I then allow prepared surface to dry, thus rendering it insoluble in cold water, so , when this surface is again wetted with cold water, it swells without olving, and, when the photograph or other picture (also wetted) is lied against this prepared surface, perfect adhesion will result n dry.

Instead of preparing the mount as above stated, I may prepare the k of the picture."

We are pleased to notice that Professor Delépine has recognised great value and convenience of dry mounting as applied to tographs—a process long ago recommended by such able photo-hers as Mr. G. Watmough Webster, Mr. Alexander Cowan, and ers.—Ed.]

WEST SURREY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Ninth of the series of annual Exhibitions held by the West Surrey Photographic Society was open on the evenings of March 23, 24, and 25, at the Felix Institute, Lavender Hill.

The Exhibition was held in the meeting room of the Society, the walls of which were prepared for the reception of the pictures by lining them with brown paper, which served well for the purpose to which it was applied. Some taste was displayed in the hanging, but the interest of the Exhibition was considerably marred the by difficulty, and, in many cases, the impossibility of discovering the titles of the pictures or the names of those who produced them, this information not being given on the pictures, and there being no catalogue published. The proceeding we were obliged to adopt was to take the frames down from the wall one by one in the hope of finding the required information on the back, a hope that was often not fulfilled. We understand, however, that the Hon. Secretary of the Society was prevented by illness from taking any part in the arrangements of the Exhibition, and this probably accounted for the oversight.

Speaking from our observation, the competitive part of the Exhibition consisted of the work of the junior members of the Society; and, if that was the case, the Society may be congratulated upon having amongst its "colts" some who promise well; but there was also a goodly number of pictures by the senior members, marked, "Not for competition." Amongst the most noticeable of these was the exhibit of the President of the Society (Mr. G. H. James), who was represented by about a dozen pictures, many of which we recognised as having been hung at more important exhibitions during the past few years. Mr. Paul Martin, Colonel Gale, and Messrs. J. Bull and G. H. Seward, all members or past members of the Society, also had examples of their work.

An interesting feature of the Exhibition was the display of the prints sent in to a competition for a photographic design for the cover of the Society's card of fixtures. Some of the designs were very quaint and original, notably those of Mr. H. J. Price, to whom the award was made.

The awards took the form of certificates of merit. The Judges were Mr. J. Bull, Colonel J. Gale, and Mr. G. H. Seward.

Mr. E. W. Burch obtained a certificate for a well-selected and pleasing view made in that happy hunting ground of the photographer, Strand-on-the-Green. In addition, he had quite a number of other examples of his work, all of them good technically, and showing a considerable appreciation of pictorial effect.

Mr. J. C. Channon's picture, *A Summer Day*, consisted of a picnic group treated in a somewhat unconventional manner, and the best had been made of a subject that required some skill in its arrangement to avoid being commonplace. This received a certificate. Mr. Channon also had a little picture of *St. Michael's Mount, Cornwall*, and some yachting scenes, presumably hand-camera work, and very good of their kind.

Mr. E. Pointon had a certificate awarded to a very simple landscape subject, which owed all its charm to its treatment. A less skilful photographer might, and probably would, have made an extremely uninteresting view with the same materials.

Mr. R. F. Thompson's *At Low Ebb*, which obtained a certificate, was one of two pictures of the same subject. In each of these were good points wanting in the other, and it is probable that, unconsciously, one instituted a comparison between them which prejudiced both. It is, perhaps, not too much to say that, if the good points in each had been combined in the one, the result would have been distinctly the best exhibit in the competition. Mr. Thompson will, no doubt, learn a great deal from the comparative failure arising from his indecision as to what he required.

The Judges also favourably mentioned a snow scene by Mr. H. P. Hoad, and a pretty little effect of clouds by Mr A. W. Curtis. Another little picture of sand dunes, printed in brown carbon, by the same gentleman pleased us; but, in its fellow, a snowy lane, the same warm tone was hardly appropriate.

Mr. H. J. Price, whom we have before mentioned as having been awarded the prize in the design competition, had a delightful little picture of Isleworth Church, in which, in the printing, he had, by some means, introduced an amount of diffusion, which, while not being sufficient to destroy texture, produced an agreeable softness. His *Thames Embankment* was also soft and delicate; but, in this case, the effect was due to the actual atmospheric conditions at the time.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Rhodanide of Ammonium.—Non-Chem asks: "What is rhodanide of ammonium? I have come across the term in a formula, and I cannot find it in any dictionary, nor do any of my friends know what it means. Can you or any of your readers inform me?"—In reply: Sulphocyanide of Ammonium.

SPIRIT VARNISH.—BARNES writes: "I have read that white hard spirit varnish, diluted with methylated spirit, makes a good negative varnish. I got some at an oil shop, but it is not white or near it, and after adding a certain quantity of spirit—not enough to make it flow easily—it all clots together. At first there is no thickening, then all of a sudden it goes into a sticky mass and nothing will get it right again. Can you tell me the reason?" You have probably got "brown hard" varnish, but this should not behave as you describe if made according to the original recipe.

ENCAUSTIC PASTE.—W. HARRISON writes in reply to "Diligent:' I do not think your correspondent ("Diligent") will find it much use employing encaustic paste to improve the keeping qualities of gelatine prints. In the case of plain paper or even albumen prints in the old days the case was different if even then there was any *real* advantage. But we could *imagine* some from a theoretical point of view, and that is recommendation enough for some people. With those papers the wax or "paste" was absorbed into the body and fibre of the paper and even permeated the albumen film, and, if any hypo was left, the particles were, so to say, isolated and, at any rate theoretically, kept from harm. But, in the case of P.O.P., the image is in the gelatine; so is the hypo if left, and that is just where the wax can't get, so it is left on the surface to add an additional gloss to what is already too painfully glossy for most tastes.

DEFECTIVE LENS.—In reply to J. Berry, it is very easy, and, if properly done, quite safe for him to recement his lens. Let him get a saucepan of cold water, and on this suspend the lens, tied loosely in a piece of muslin to form a bag, for convenience of handling. Lay a stick across the saucepan, and hang the lens from this. Set the whole on the fire, and when the water is fairly hot, lift out the lens and try if the two elements will slip apart when pressed sideways between the fingers. If not, heat further, until the balsam is softened sufficiently. When this occurs, the lenses will separate quite easily. Get them clear of one another, take the pan off the fire and allow to cool, in order for safety's sake to allow the glasses to anneal. Next clean them thoroughly of the old balsam by means of turps or ether. Now heat both as hot as the hand will comfortably bear, drop a drop or two of melted balsam into the concave one, and press both together, working them, if necessary, until all air bubbles are driven out; and finally lay the lens, convex side downwards, on a soft cloth, and on the plano or concave side place a small heap—three or four—of coins smaller than the lens itself, and on top of those some heavier weight to keep them pressed together. The small coins will cool the centre first, and prevent the formation of a vacuum, which would cause air bubbles; as it is, the still soft balsam is drawn inwards as the centre cools, and bubbles prevented.—SYNTAX.

News and Notes.

MR. A. L. HENDERSON has had Her Majesty's commands to photograph the interior of the Queen's private apartments in the Hotel Regina, Cimiez.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, April 7, at eight o'clock. *Some Objects of Interest from the Club's Museum.* Mr. E. W. Foxlee.

MESSRS. STREET & Co., Advertising Agents, of 30, Cornhill, E.C., and 5, Serle-street, W.C., announce that, in consequence of their increasing business and for the convenience of their West-end clients, they will open, on Monday, April 5, 1897, a branch establishment at 164, Piccadilly, London, W.

THE Dean of St. Paul's has decided not to let the Churchyard on Diamond Jubilee Day, and has had to refuse the offer, made by a well-known photographer, of Regent-street, to give a donation of 5000*l.* towards the fund for the interior decoration of the Cathedral in return for his having the privilege of erecting seats in the Churchyard on June 22.

ON April 9 will be published the first of a series of special numbers of the *Navy and Army Illustrated* (edited by Commander Charles N. Robinson, R.N.), devoted to the Reserve Forces, and entitled "Our Citizen Army." The issue will contain numerous illustrations of various Volunteer and Yeomanry regiments. The letterpress will be the work of "Callum Beg."

THE Fourth Monthly Dinner, organized by the members of the London Chamber of Commerce, will take place on Tuesday next, at 6.15 for 6.30 p.m., at the Trocadero Restaurant, Shaftesbury-avenue, W.C. The subject for discussion will be *Art in its Relation to Industry*, and Sir James Linton, P.R.I., will take the chair, and amongst those who have promised to attend and speak are Mr. Marcus Stone, R.A., Mr. Walter Crane, and Mr. H. S. Mendelssohn.

A RIVAL to Edison's Phonograph is being brought forward in a machin called the Echograph. The engraving is done on steel or zinc plates, which ar practically indestructible, and these sound plates can be sent abroad in paper covering. It is claimed that this is much better than the wax cylinder used in the phonograph, as 110 sound plates, which can be used on both sides take the place of six wax cylinders. The same apparatus is used for engravin and reproducing.

MR. ALPHONSE BERGET recently described a method of studying the expan sion of liquids by means of photography. Two balances of equal sensibility with their planes of oscillation at right angles, carry two weight thermometers one containing the liquid under examination and the other mercury. A ray o light is reflected from two mirrors, one on each beam, and this records on sensitive plate a curve analogous to Lissajous' figures. This curve is th graphical representation of the expansion of the liquid.

STATUES OF GLASS.—A company of glassworkers have recently discovere that ordinary plate glass will make a more durable monument than th hardest marble or granite, for glass is practically indestructible. Wind, rain heat, or cold, will eventually crumble the hardest rock, and one can seldon read the inscription on a gravestone fifty years old; but a glass monument wil look as fresh after the lapse of centuries as on the day of its erection, and th inscription can be made ineffaceable. The thick plate glass used to glaze th port holes of steamers will resist the stormiest sea, and is practically un breakable.

DEATH OF MR. EDGAR PICKARD.—We regret to announce the decease o Mr. Edgar Pickard, of Altrincham, which occurred at his residence la Saturday evening, after a short, but severe, illness, at the early age of thirty five. His name was well known in the photographic world in connexion witl the Thornton-Pickard Manufacturing Company, Limited, of which he wa one of the founders. Mr. Pickard was a gentleman who commanded th confidence and esteem of all who knew him. Steadfast to his principles diligent in business, and with a firmness of will that every one admired, hi was an exemplary and attractive character. Combined with these qualities he possessed a kindliness and generosity of heart which was especially pro minent in his private life. He was a member of the Society of Friends and son of George Pickard, J.P., of Crow Hill, Mansfield. He leaves a widow and one child, and his loss will be mourned by a large circle of friends an acquaintances.

VIGNETTING GLASSES.—Rev. Arthur East, of Witney, writes: "Man amateur photographers may be glad of a simple way of making their own vignette glasses, and at practically no cost. We take a piece of brown pape and cut it to the shape and size of the vignettes required, and paste it on to a old and cleaned (or a piece of ground glass by preference) negative glass. This i put into a printing frame, the paper being *outside, i.e.*, farthest away from th back; then upon this is laid a sensitised plate *reversed, i.e.*, the film next t the back of the printing frame; put on the back, and adjust the fixings, an expose to daylight or artificial light exactly as in making a lantern transparenc by contact, only that during exposure the printing frame should be held in th hand and twisted in all directions to get a soft shading; then develop righ through the film until it will develop no more, and you will have a perfec vignetting glass, so soft in shading that you may print with it in full sun shine. Any old and doubtful plates may be used for this purpose, th exposure naturally must be suited to the kind of plate used, and in use th film side of the vignette glass should be farthest from the negative if a sof outline is required.

THE Sixth Annual Exhibition of pictures by the leading photographic worker and the Annual Exhibition of photographs by members of the Louth an District Photographic Society, organized by the Louth and District Phot graphic Society, was opened at the Town Hall on Thursday afternoon March 25, by the Mayor of Louth (Alderman Henry D. Simpson). Th Exhibition is thrown open to the public two days without any charge, and th Society bears all the cost of the Exhibition, which, according to a remark th President (the Rev. J. E. Standen) let drop at the opening ceremony, is n trifling sum. This form of exhibition is unique, and it is greatly to th credit of the Society that it shows such courage in advancing photograph taste and interest in the town and district, and we may say that, since th Society was established in Louth, photography has been taken up by man amateurs, who have shown great artistic taste in the pictures they have pr duced. The exhibits were arranged in the large room and also the Counc Chamber, and some idea of the work of organizing and carrying out this Exhi bition may be gathered when we state that in the large room there were no les than 485 individual pictures and in the Council Chamber the members alone con tributed 216 pictures. The public generally appreciate the generosity of th Society in giving them such a treat as this Annual Exhibition affords, and it i to be hoped that this Society may prosper and continue to hold this and othe meetings which have such educational interest attached to them. A matte of regret was that Mrs. S. F. Clarke at the last moment was unable to exhibi amongst the members of the Society on account of being taken ill just as sh was getting her work ready, and universal sympathy was expressed when th reason of her absence became known. We commend the President and th Committee for the willing manner in which they worked to make the Exhibi tion successful, and too much praise cannot be bestowed upon Mr. S. Franci Clarke, the hard-working Hon. Secretary, for the lion's share of the work fall upon him, and he cheerfully carries it out, and to whom and Mrs. Clark Louth is, we may say, indebted for its Photographic Society and their man pleasant meetings.

THE Croydon Camera Club held a very successful display of photographs o the screen—which, numbering in all over 200, were all of them the work o members—at the small Public Hall on Wednesday, March 24, in aid of th Croydon General Hospital. The first part was entitled *The Palace of Prime Minister.* The audience was first taken up the great avenue of Hatfiel House, then shown the wonderfully well-fashioned, inner gates (Watson) an the great marble hall (Jenkins). Croydon must be militant, not to say blood

irsty, judging by the thundering applause with which Mr. Maclean's ference to "the Eagles wrested by Wellington from Napoleon" was greeted. assing through the armoury, some exquiste views of the consummately great aircase were next shown (Watson, Puley, Jenkins, and Underhill). The long allery, 160 feet in length, next claimed attention. The cradle of Queen lizabeth drew an interesting allusion to Anne Boleyn. King James's room oked much admiration, and also induced a light escape of carbonic acid gas, hich issued from between the teeth of the audience in consequence of some- ing pictured which they did not esteem. However, some allusions by Mr. laclean to the indications of affectionate regard in which the master of the ouse is held by his servants turned the audience cheering, and presently they ere laughing over Qneen Elizabeth's first pair of silk stockings. After peeping nto the Queen's bedroom (Underhill), a move to the outside was made. The outh front showing details of tower over door (Maclean), and various other iews from the gardens, by Messrs. Wratten, Jenkins, and Puzey, were well eceived, as also were the priory garden (Maclean and Puzey), and the rose arden and old palace (Maclean). In conclusion, the President reminded his udience that at intervals, during not less than 300 years, the Cecils have filled he highest post under the Crown, beginning with Robert Cecil, first Earl of urleigh, and "last in time, but by no means in distinction, the Queen's Prime linister in the year of the Diamond Jubilee." Sir W. Vernon Harcourt, M.P., ad his turn in the second part, for Councillor J. Noaks showed some interest- ng snap-shots taken at Malwood during a meeting of the Associated Chambers f Commerce, the great tribune of the people being greeted with loud cheers. Ir. A. J. Noaks obtained a favourable reception for a charming child study, alled *A Son and Heir*. Next came Mr. Holland, whose Devonshire views ere of the same high pictorial and technical quality as of yore, and were well ccompanied by applause. Mr. John Smith surpassed himself with many iews of Frittleworth and elsewhere. *Having a Cool Draught*, a wonderfully lever snap-shot *genre* picture, was, perhaps. most meritorious, and well eserved the prize awarded it in the Paget Competitions. Mr. W. G. Watson as exceedingly strongly represented with a couple of dozen slides taken at the eeds Convention. Mr. G. W. Jenkins displayed some finished studies, ainly Canterbury. Mr. S. Carley showed Croydon *versus* Oxford University t football and other good things. Mr. F. J. Elkin delighted the audience ith some capital pictures of the Parish Church, also seaside views. Mr. Jnderhill contributed three choice pastorals, and, finally, Mr. J. Chadwick aylor displayed a captivating assortment of frenagraphs, mainly Channel Isle tudies. *The Foaming Tide* and *A Whirlpool* thoroughly caught on, as did *The Lovers' Seat in the Off Season*, which represented a well-known "pop-the- uestion" bench at Croham Hurst under six inches of snow. The display oncluded with a repetition of some moving photographs formerly shown by Ir. Adolph Langfier.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
5	Camera Club	Smoking Concert.
5	Putney	*The Intensification and Reduction of Negatives.* Thomas Bolas, F.C.S., F.I.C.
5	Richmond	Lantern Evening.
5	South London	Annual Meeting.
6	Brixton and Clapham	*The Making of Enlarged Negatives by Artificial Light.* G. W. Welham.
6	Hackney	*Dark Room and Studio Construction.* G. D. Sargeant.
6	Isle of Thanet	*Bromide Printing and Mounting.* E. Deacon.
6	Lewisham	Annual General Meeting.
6	Munster	Demonstration on Carbon Printing. C. H. Pearne.
6	Rotherham	*Enlarging.* John A. Hodges, F.R.P.S.
6	Wolverhampton	*Pomona Revisited.* Messrs. Taylor and Deans.
7	Camera Club	*Pictures from Sicily.* Law Bros.
7	Edinburgh Photo. Society	*Some Uses of the Camera to an Engineer.* William Penman, C.E.
7	Halifax Camera Club	Members' Lantern Evening.
7	Leeds Camera Club	*Practical Pictorial Photography.* A. Horsley Hinton.
7	Leytonstone	*Instantaneous Photography.* F. O. Bynoe.
7	Photographic Club	*Some Objects of Interest from the Club's Museum.* E. W. Foxlee.
7	Southport	*Hand-camera Work.* W. Thomas.
8	Camera Club	*The Phonograph.* Mr. Stroh and F. C. B. Cole.
8	Darwen	Prize Slides.
8	Manchester Photo. Society	*Platinotype Process* and *Platinum Toning of P.O.P. Papers.* A. E. Casson.
8	Oldham	*Lantern-slide Making by Reduction.* T. Burton.
8	Polytechnic	Half-yearly Meeting.
8	West Surrey	*Mounts and Frames.* G. Bottle.
8	Woolwich Photo. Society	*Architectural Photography.* Charles H. Oakden.
9	Bromley	Open Night.
9	Croydon Microscopical	Conversational Meeting.
9	Ireland	Views by J. A. C. Ruthven.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ARCH 25.—Mr. E. G. Harvey in the chair.

Mr. John Bulbeck was elected a member of the Association.

The HON. SECRETARY announced the fixtures which had so far been arranged or the new programme, and that no meeting would take place upon the Thursday before Good Friday.

Mr. T. E. Freshwater (Hon. Secretary) entertained the meeting with a display of slides from negatives and sketches taken during the Nansen Polar expedition. The two volumes of the Doctor's recent work, containing his experiences and observations, were upon the table. The slides included portraits of the leaders and members of the crew, pictures showing their life and habits during their long absence, and a number describing their scientific work, such as ascertaining the temperatures of the water at different depths, dredging, &c. The meeting of Nansen with Jackson, and pictures of the latter's headquarters at Elmwood, besides photographs showing the effect of the great pressure of the ice in throwing up the *Fram*, were also projected on the screen.

Mr. Hill showed a few slides of Japanese types, dancers, &c., and the meeting closed with a vote of thanks to Mr. Freshwater for his display.

PHOTOGRAPHIC CLUB.

MARCH 24,—Mr. A. Mackie in the chair.

The minutes were read and confirmed.

Mr. J. Agar Baugh was elected a member of the Club.

Mr. THOMAS BEDDING read a paper on

FINDERS. [See p. 26 LANTERN SUPPLEMENT.]

Mr. TOTTEM said that the "twin" lens camera method had been used by Mr. Hyslop in his celebrated instantaneous series of 18 × 16 pictures of yachts.

Mr. FOXLEE said no doubt the most noticeable defect in connexion with finders was that they were, for the most part, badly adjusted. It was a difficult matter to get perfect adjustment. In the case to which Mr. Tottem had referred, the actual facts were that a 5 × 4 camera, with a suitable lens, was used as a finder to a 20 × 16 camera, and it had taken him, the speaker, a couple of days to get the adjustment quite perfect.

Mr. FRY said he hardly thought that the writer of the paper had done full justice to Mr. Chadwick's finder, which was both simple and efficient. He had himself had one in use for some years. His camera, in addition to the pin-heads mentioned by Mr. Bedding, had two white lines connecting the base with the apex of the triangle, which marked the angle covered by the lens. These white lines stood out clearly upon the black-leather covering of the case, and the eye had no difficulty whatever in continuing them in imagination. In this way it was obvious how much of the view before one would be included within the angle covered by the lens. Chadwick's finder made no provision for determining the amount of foreground included in the picture. The art of holding the hand camera in the horizontal plane was a necessary instinct for that class of work. Mr. Bedding had not alluded to Adams' bright view-finder; that instrument was, he thought, free from most of the defects which had been referred to in the paper. He found it to give a clearly defined and easily discernible image without any hood or protection, and, so far as he had had experience of it, it was a most desirable adjunct.

Mr. TOTTEM stated that some of the original Kodaks had lines upon the top to indicate the angle of view included.

Mr. SINCLAIR said that the various forms of cameras, of which Mr. Sutton's Reflex was a type, had not been altogether a success from the manufacturer's point of view. There was some difficulty in maintaining the exact position of the mirror, and when the mirror formed part of the shutter there were other difficulties of a practical nature. The result had been that the makers of cameras had returned largely to the "twin" lens pattern. He knew that many finders were badly fitted. His firm (Messrs. Adams & Co.) had endeavoured to cope with the matter, which was practically one of cost of adjustment—in other words, the time of a skilled man which was necessary to do the work. Regarding the bright view-finders, these were introduced by Adams & Co. as an improvement upon the old form. Adams' bright view-finder had three lenses. A reflector was placed between the second and third lens. The third lens, which was in the position of the ground glass of the ordinary finder, showed a positive image, was a miniature representation of the object about to be photographed, and would not alter its position when viewed from a different standpoint. The field covered by the bright view-finder could be made to represent a lens of any angle.

Mr. BRIDGE said the step from a view-finder to a view meter was not a large one. He showed a telescopic view-meter, which had been made for him by Dallmeyer, and which he found a very useful instrument. The tube was marked in such a manner that he could ascertain from it what length of focus a lens would require to be to include a certain amount of a subject upon a plate of given dimensions.

A desultory discussion took place upon the correctness and efficiency of the Chadwick lines.

Mr. FRY pointed out that the indication of the angle the view included was correct from whatever point the eye observed, and that the finding lines were efficient whether the camera was held in the orthodox Chadwick method, which is underneath the chin, or in the more conventional one, under the arm or elsewhere.

A vote of thanks to Mr. Bedding concluded the meeting.

Borough Polytechnic Photographic Society.—March 24, Mr. A. Bedding presiding.—A lecture,

ENLARGING,

by Mr. John A. Hodges, F.R.P.S., was read by the HON. SECRETARY (Mr. P. J. Brown), in which the writer set forth in a very clear manner the many points to be observed in this fascinating branch of the art. The paper was well illustrated by some canvas sketches, showing different forms of apparatus, by some negatives and transparencies, and also by various bromide enlargements, indicating under, over, and correct exposure, and pointing out many other defects.

Camera Club.—The attractiveness of mountain climbing and Alpine photography has been well proved in recent lectures at the Camera Club. On Thursday, March 25, Mr. LAMOND HOWIE delivered a descriptive address,

illustrated by a series of lantern slides, upon the subject of the Alps from Mont Blanc to the Matterhorn. It is hardly necessary to say that, with so able a photographer and practised speaker, the slides were of the highest excellence, and the lecture well planned. Mr. Howie's lantern views and experiences constituted a most instructive guide to Alpine picture-making, and his audience were held in the closest attention throughout.

On Monday, March 29, Mr. Henry Speyer addressed the members upon the aspect of *Snowdon in Winter*, and the interesting climbing and pictures to be achieved there in that season. Mr. E. Barron occupied the chair. The lecturer's mountaineering slides were of excellent quality, and some of the cloud effects were exceptionally striking. The second part of the lecture dealt with climbing in Dauphiné, where, from one point of view, thirty peaks of 13,000 feet can be seen at one time. Some discussion followed upon the perennial topic of development of snow and ice pictures. Hearty votes of thanks were accorded the lecturer at each meeting.

Leytonstone Camera Club.—March 24, the President (Dr. Turner) in the chair.—The Prosser-Roberts Company gave a very interesting demonstration of

Photography by the Röntgen Rays.

Mr. J. D. Evans, who represented the Company, first dealt with the history of the rays, which it is unnecessary to repeat, as they have been dealt with so often of late. He next showed the apparatus required, the induction coil being the most expensive part, and he advocated that this should be English-made. He found a four to six inch spark to be the most useful for ordinary work, and the best distance to be about six inches from the tube to the object. In the case of a radiograph of the hand he found from one to two minutes to be the correct exposure. Care should be taken in switching on the current, the different effects being explained. Two very successful radiographs of the Chairman's hand, upon Eastman's X-ray paper, were obtained, being developed in the members' presence by the Hon. Secretary, amidol being the agent used, every member present having the pleasure of examining his own limbs by means of a large fluorescent screen, likewise the contents of a number of sealed packages, containing keys, pincers, &c. In the interesting discussion which followed several members expressed themselves that they had heard Swinton, Greenhill, and others, but never before so lucid an explanation of the subject as what they had seen and heard that evening. A hearty vote of thanks to the lecturer, who responded on behalf of Messrs. Prosser-Roberts, concluded a most enjoyable evening.

North Middlesex Photographic Society.—March 22.—A fair number of members and friends attended to witness a show of members' slides. The sides selected from among those sent into the competition were shown first, and then slides by Messrs. Barton, Beadle, Everett, Lisett, Mummery, Staveley, Stuart, Taylor, and Treadway were passed through.

March 29, Mr. Mummery in the chair.—Mr. Murrow, a member, presented to the Society a framed portrait of the late Mr. J. Traill Taylor, an hon. member of the Society. The thanks of the meeting were passed to the donor for his handsome gift. Mr. Cox (Hon. Librarian) announced sundry additions to the library, partly proceeds of the sale of surplus copies and gifts from members. The third monthly competition in lantern slides then took place. It resulted in a tie between Mr. Mummery (the President), with a view of the interior of Aldborough Church, and a view of *Thames Barges*, by Mr. H. Stuart. Slides by Messrs. J. A. Johnson, Lisett, Mummery, Mattocks, Pring, and Smith were also selected for the Society's collection. Mr. J. MacIntosh then detailed a method of printing in clouds in lantern slides by contact. He printed a landscape upon a film coated with lantern-slide emulsion, and, when dry, placed it down on to another film, making pinholes through both at each corner, and binding with gummed paper, then printing through this from a sky negative; when finished, the register could be easily found by means of the pinholes.

Ashton Photographic Society.—March 25, Annual Meeting, Dr. Hamilton presided.—Mr. T. R. Marsland (the Secretary) presented the sixth annual report, which congratulated the members on the continued success of the Society. The meetings for demonstrations, lectures, &c., during the latter part of the year had been better attended than at any previous time. The subjects treated had been more varied in their character, and it was hoped the members had received greater benefit from them. The reading-room and library had become a very useful adjunct to the Society's work. Special mention should be made of the gift of books to the library by Mr. E. H. Andrew, and the gift from Mrs. Palmer of three beautiful enlargements by her late husband, the Rev. H. J. Palmer, M.A., a former Vice-President of the Society. The rambles during the summer were much better attended than in the previous year, the weather being more favourable. Dr. Hamilton, in moving the adoption of the report, commented upon each paragraph. In reviewing the work of the Society in this manner, he made special mention of the free lectures at the Mechanics' Institution, and the Affiliation scheme of Photographic Societies, from which they would expect to get pictures, lectures, and sets of slides, with mutual use of one another's rooms. Ninety societies had joined the Affiliation up to the present time, the Royal Society in London being the head. It was three years since the Exhibition was held in the town, and it was for the members to say whether they would have another similar to the last, and one which would by no means fall below the last in standard of excellence. The balance-sheet which was presented showed a deficit of over 5*l*. This was explained as having occurred through the free lectures which were given. The election of officers resulted as follows:—*President:* Dr. Hamilton.—*Vice-Presidents:* Major Bradley, Messrs. Abel Buckley, J.P., T. Cheyne, T. Glazebrook, John W. Kenworthy, J.P., Charles Lord, C. E. Redfern, J.P., and J. Wilson, J.P.—*Committee:* Messrs. W. C. Brown, E. H. Hampson, Joseph Hutchinson, Thomas F. Kershaw, John T. Lees, Stephen Sharp, Charles Taylor, and Samuel Woolley.—*Librarian:* Mr. Sam A. Platt.—*Hon. Treasurer:* Mr. Walter Leigh.—*Secretary:* Mr. Robert T. Marsland. Votes of thanks to the Auditors (Messrs. Dunkerley and Turnbull) were passed, and they were re-elected. Two delegates to the Affiliation of Photographic Societies (Dr. Hamilton and Mr. Charles Lord) were elected, and it was resolved that an Exhibition on similar lines to the last be held in the month of November in the Town Hall.

Bradford Camera Club.—March 25, Mr. Scarlett presiding.—Mr. Walter Booth (President) gave an exhaustive and practical demonstration on

Platinotype Printing.

The lecturer gave a brief sketch of the history and chemistry of the process, and illustrated his remarks by numerous examples of his own excellent work in architectural and flower studies, in both of which branches Mr. Booth is an adept. He explained at some length the construction of the calcium tube, why it was so necessary to preserve the paper from moisture, and also gave instructions of how to make a very simple yet effective exposure meter for using with the paper, and illustrated the permanence of the paper by pouring a small quantity of nitric acid upon a platinum print, upon which it had no effect, whilst upon various other papers it at once completely destroyed the image. He showed also a platinotype print ten years of age, which was quite unaltered, whilst a bromide print produced about the same time was quite faded and discoloured. The lecturer then developed a number of prints, produced cold and warm, black, sepia, and brown colours by development only, and gave instructions how to produce still warmer tones by the addition of a little mercury or carbonate of soda. Mr. Booth has a very pleasant way of dealing with a technical subject, and the lecture had attracted a crowded audience, whose notebooks were much in evidence. A hearty vote of thanks was passed to the lecturer, and a number of questions were asked and answered. A number of new members were proposed, and the Club is evidently in a thriving condition. The Committee have arranged a number of elementary demonstrations by practical men, which ought to attract the budding amateur.

Bradford Photographic Society.—March 22, Mr. Oliver Nicholson presiding.—Mr. T. E. H. Bullen, the head of the firm of the Gem Dry Plate Company, gave a lecture and demonstration on the working of their new plates and films. The lecturer showed specimens of many of the different kinds of film negatives, both on the paper supports and also on the celluloid supports, from the very earliest introduction of films. An interesting feature was the new glass stripping plate for carbon work. This is really a great boon to carbon workers, as it will do away with the very risky method of the double transfer. At the close a hearty vote of thanks was given to the lecturer, on the proposition of the Rev. W. Eastlake, seconded by Mr. Stephenson. Mr. Bullen briefly responded, and, in doing so, paid a compliment to the Society. He said he had been lecturing before several societies in the north, but he had never had so large an attendance of members at any of his previous lectures. The Secretary presented his report of the meeting held last Thursday at Leeds of the delegates of the Royal Photographic Society. It was resolved that a petition be drawn up and signed by all the members of the Society, petitioning the railway companies to give to the members of the Society, on the production of their cards of membership and apparatus at the booking office, reduced fares. This was proposed by Mr. Oliver Nicholson, seconded by Mr. W. Drake. Several samples of plates and lantern plates left by Mr. Bullen were distributed amongst the members.

Liverpool Amateur Photographic Association.—March 25, the President (Dr. J. W. Ellis) occupied the chair.—The feature of the evening was a lecture by Mr. Joseph Earp, entitled

Alpine Lowlands,

being an account of a holiday in the Swiss valleys in company with Mr. J. H. Day. The lecture was in Mr. Earp's usual racy style, and riveted the attention of the audience from first to last. The slides were the joint work of the lecturer and Mr. Day. A hearty vote of thanks was accorded both gentlemen at the close of the meeting.

FORTHCOMING EXHIBITIONS.

1897.	
April 3–May 1	.....*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.
,, 19	..... Beverley Photographic and Sketching Society. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Patent News.

The following applications for Patents were made between March 15 and March 20, 1897:—

Colour Photography.—No. 6704. "Improvement in or relating to Photography in Colours." J. Joly.

Sensitised Leather.—No. 6769. "Manufacture of Prepared Sensitised Leather for Photographic Purposes." Communicated by The Farbwerke vormals Meister, Lucius, & Brüning. O. Imray.

View-finders.—No. 6871. "An Improved Fitting for Photographic View finders." H. Hill and E. G. Price.

Bird's-eye Photographs.—No. 7060. "Improvements in connexion with the Taking of Bird's eye Photographs." H. A. Lewis.

Camera Obscura.—No. 7116. "An Improved Apparatus similar to a Camera Obscura." Complete specification. The Internationale Automaten Gesellschaft.

Printing in Natural Colours.—No. 7193. "Apparatus for the Preparation of Plates for Printing in Natural Colours." J. Meyer.

Animated Photography.—No. 7214. "An Open-work or Perforated Screen for Obviating the Effects of the Scintillation experienced in Viewing Projections of Animated Photographs." L. Gaumont.

Mounting Photographs.—No. 7248. "An Apparatus for Mounting Photographs." A. Tomkins.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PURIFYING FRENCH CHALK.

To the EDITORS.

GENTLEMEN,—I have been expecting to see some photographer of repute giving his advice as to French chalk in answer to the inquiry of S. S. C. (p. 170). Mr. Bolton's note in your last number hardly does this, perhaps you will allow me to add.

In the first place, *French chalk* is not chalk at all; what should be sold by that name is *steatite*, or soap stone. It used to be used by bootmakers for helping on tight boots in the old days of Wellingtons, but has probably been superseded by chalk both for that and gloves. I should recommend your correspondent, if he wants to be sure of the article, to buy a piece of steatite, powder it, and wash it for himself. Talc is sometimes called French chalk, but not correctly; it may answer, however, as well for stripping films, but I should prefer the steatite myself.

The powdered substance should be mixed in water and stirred up; a few moments will allow all the gritty particles and larger pieces to settle, the rest should be poured off and allowed to settle at leisure. The longer the first settlement takes, the finer the resulting powder will be; and what has been rejected at first may yield a further supply if again rubbed down.—I am, yours, &c., J. F. T.

March 27, 1897.

THE PROFITS OF PROFESSIONAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Your article on this subject ably summarises the present position of too many professionals.

It is a discouraging fact, that men of artistic training, and possessing considerable business acumen are at this moment greatly troubled to make their undertakings profitable.

The amateur is sometimes made responsible for this state of affairs; but, surely, no one will urge that the average amateur's work can enter into serious competition with that of the *trained* professional. If anything, the tyro assists the trained artist by illustrating to his friends the difficulties that attend the production of really good portraiture. The greatest damage has probably been done by the "cheap-and-nasty" professional, who has succeeded in disgusting the cultured public, and in lowering the critical standard of the less discriminating masses by appealing strongly to their economic instincts.

These low-class photographs seem to meet the eye everywhere, and they must inevitably tend to affect the general attitude of the public towards photography as a business.

Then, in a somewhat different position, may be found the fairly able photographer chafing, probably, against his enforced inaction. Hoping to attract new business, he enters into a *cutting competition* with his neighbour, doing his very best, in fact, to convince the general public that the value of his time and skill, and that of his assistants also, is practically nothing. Surely, when the hysteria of such a struggle is over, this man must realise that he has worked and laboured in vain, and at the same time helped to injure the prospects of the profession at large.

At the top of the professional tree even, firms with old and honoured names, and employing many assistants, enter into a system of polite *touting* for work, which cannot elevate the position of photographers in the public esteem. Possible clients are written to all over the country, and informed that the firm's operators will call for orders. Is not this degenerating the profession into a trade? and, if so, can we wonder at professional profits vanishing?

Guests at public dinner tables are photographed in the glare and odour of magnesium by an arrangement between photographer and hotel manager, whether the guests approve of the matter or not.

On one occasion, in a large public hall, scores of people rose from their seats and protested against the operation, and it is evident that this method of doing business does not strengthen the professional position in the public imagination.

It may be easy to find hundreds of causes operating to the diminution of professional profits, but none can be more fatal than the habit of self-depreciation shown by the business policy of some photographers.

Want of some standard of ability, want of unity, want of professional dignity—these, surely, are the canker places which have eaten into the erstwhile substantial profits of the profession.—I am, yours, &c.,

Studio, 8, *Regent's-terrace*, *Hull*, *March* 27, 1897. T. C. TURNER.

WHAT IS ARTISTIC PHOTOGRAPHY?

To the EDITORS.

GENTLEMEN,—I have this evening picked up the April number of *The Woman at Home*, and read an article on "The Art of Photography," by Marie A. Belloc, illustrated by photographs taken by the Cameron family—Mrs. Julia M. Cameron and Mr. H. H. H. Cameron. The article describes how Mrs. Cameron received, at the age of 50, as a gift from her daughter, "the camera which was to prove the source of so much pleasure and *fame*. She began with no knowledge of the art, no one taught her how to place her dark box, how to focus her sitters, or how to develope her plates." Her studio was a "hen-house" at Freshwater, her sitters the most distinguished men and women of the day. She received from Mr. Watts the eulogium, "Her work will satisfy posterity that there lived in 1866 an artist as great as Venice knew." Mrs. Cameron says, "When I have had these men before my camera, my whole soul endeavoured to do its duty towards them in recording faithfully the greatness of the inner as well as the features of the outer man. The photographs thus taken have been almost the embodiment of a prayer." A little further on, Mr. Cameron says: "Yes, famous people often make the best sitters. This is, of course, owing to a variety of causes. Thought, learning—intellectual power of any kind—leaves its stamp on a face, and, indeed, on the whole individuality of a man." The article throughout gives the impression that art in photography will become extinct when the Camerons are dead. Accompanying the article are nine photographs, reproduced by process blocks, and a copy of a painting of Mrs. Cameron, by G. F. Watts, R.A. Now, sir, as an ordinary every-day portrait photographer, I wish to offer a few criticisms on those nine photographs—paragons of artistic beauty—and to see whether my brother photographers agree with me, or whether, taking a lesson from the examples given, they wish to emulate the Cameron photographs in their future business. Let me say, however, that I am not a young man just commencing business: I am the oldest established photographer in an important manufacturing town. Before touching photography I was under an artist of some repute for eight years as a pupil in drawing and painting, served an apprenticeship of several years, after I became of age, with a leading photographer, and have had frequent opportunities of studying pictures in most of the galleries in Europe. I have received from the public between 30,000*l.* and 40,000*l.* for photographs, so you see I have had a little experience. Yet all my time has been spent in vain, and I have to unlearn all my experience has taught me, if these portraits are what we have to aim at as the highest art. The first is of Thomas Carlyle, the sage of Chelsea. Look at him! Look at his own criticism: "Has something of likeness, though terrifically ugly and woe-begone! My candid opinion. T. Carlyle." If I did not know it was Thomas Carlyle, I should say it was a drivelling imbecile who, starving to death, had pawned his shirt and was contemplating the least painful way of putting an end to an intolerable existence. The lighting of the face, the under-exposure, the hard development—patches of white and black—help to accentuate these impressions. My opinion is exactly expressed in Carlyle's own.

No. 2 is of Robert Browning, one of the most amiable of men and best of sitters. The portrait is not bad, but there are a thousand photographers now living who would take one just as good. It is but an every-day picture, such as you could see in hundreds of third-class studios.

No. 3 is of an equestrian statue, by Watts, with the artist standing by. The mid-day sun is shining full on; there is no half-tone or shadow to show up the modelling, but the whole statue is a monotonous piece of white. Any amateur with a two-guinea camera could do a picture just as good.

No. 4 is of Sir John Herschel. What intellect! what perception! what soul! To my uneducated mind he looks like a miser, afraid of having his pockets picked.

No. 5 is of Mrs. Thackeray Ritchie, who, I suppose, must have been a lady of distinction to be chosen as one of the illustrations. To me she looks worn out with fatigue, and ready to fall asleep. We will pass by No. 6. It is the interior of a room, with a young lady sitting in a chair perfectly unoccupied (I mean the young lady is unoccupied). I don't see much wrong about it, but there surely is nothing unusual about it to distinguish it from any amateur work. *Russell Lowell* is No. 7. He is taken perfectly full face, apparently to give value to the inverted horn that is appended at each side of his beard. An ordinary, soulless photographer would have turned him a little to the side, and, with a hand held towards the face, hidden at least one of those ugly overgrowths. Evidently also to give force to ugliness, *Charles Darwin* (No. 8) is almost profile, in order to show the Swiss-châlet-roof-like forehead that hangs over his eye. The face shows no more expression than a chimpanzee. It is refreshing to turn to the last—that of *Hallam, Lord Tennyson*. This has qualities that even an ordinary mortal can appreciate. The pose is easy, and the face so placed as to bring out the fine nose and brow; the lighting is soft, and the expression full of thoughtfulness. This is, in my opinion, so good that it might have been taken by a *human* photographer.

Will you now, sir, turn to pages 622 to 625 of the same magazine, where are reproductions of a few brides, under the heading "Brides and Bridegrooms." Every one of them is a good photograph, and every one by a different artist. I am constrained to write the above because it is the custom in photographic exhibitions to give preference to works of art that have qualities exactly opposite to those that are appreciated by the general public. Under-exposed, badly lighted, out-of-focus portraits of ugly people (adults and children) are hung on the line, while pleasing, well-finished, and beautiful portraits, such as the public will buy, are rejected or "skyed." Will you let us thrash this matter out in the

JOURNAL and have a vote on it, and if we, the professional photographers are wrong, and the impressionists right, then let us abandon our old methods and educate our customers up to the level of this divine art of portraiture.

With many thanks for your patience in reading the above,—I am, yours, &c., JOHN E. SHAW, F.R.P.S.

Burlington House, Huddersfield, March 24, 1897.

NEW AMERICAN PATENT LAW.

To the EDITORS.

GENTLEMEN,—The Americans have at last become alive to some very serious abuses incident to their boasted Examination System. Among these are the following:—

1. Patents have frequently been many years (in one or two instances lately sixteen years) in passing through the office, from the date of original application to the date of actual grant.

2. It has often happened that an invention has been published for many years in the country without being patented, and then, when some enterprising firm has taken it up and made it valuable, the original inventor has taken out a patent for it, and made the said firm pay heavy royalties for its use.

3. As an American patent is only granted for the duration of the earliest expiring prior foreign patent, if there be one, Americans very frequently lose their foreign rights through being forestalled abroad, while they are slowly working their American patents up to allowance, they not daring to apply for foreign patents in the meantime for fear of injuring their home rights.

To meet these and other defects, Congress has just passed a new Patent Act, to come into force on January 1. Its principal points are as follows:—The patenting abroad by other parties, or the publishing of the invention in any country more than two years prior to the application for an American patent, is fatal to the latter. So is the public use or sale of the invention in America more than two years prior to the application for a patent there, unless it be proved that such use was abandoned by the applicant or his representatives. The application of an invention patented abroad must be filed within seven months of the earliest foreign application; the patent will then be granted for seventeen years. If the application be not filed within that time, the patent (if granted) will be void. A patent application refused by an examiner must be amended or the refusal appealed against within a year of such refusal, otherwise the refusal will become final (hitherto the law gave two years, which the Patent Office of late arbitrarily shortened in practice to six months). Similarly an application filed in an incomplete state must be completed within a year, or will be held to be abandoned. The Statute of Limitations (6 years) shall apply to infringements of patents. These acts, except this last previous clause, shall not be operative on any patent applied for before January 1, 1898.

As this new enactment is of vital importance to English patentees, it is desirable to give it as wide a publicity as possible.—I am, yours, &c.,

WM. P. THOMPSON & Co., *International Patent Agents.*

6, *Lord-street, Liverpool.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Joseph Ramsden, 43, Granby-street, Leicester.—*Photograph of John Roberts, billiard player. Cabinet size.*

Albert Rudolph Douglas, 23, Upper Dicconson-street, Wigan, Lancashire.—*Photograph of C. H. Moody, Esq., I.S.M., seated.*

Frederic Corrall, 2, Cotham-terrace, Bristol.—*Photograph of a painting of the Queen when six months old, with her mother, the Duchess of Kent. Taken from an old picture on ivory.*

FACTS; E. MOOR.—In our next.

W. E. MARTIN.—Thanks for your communication.

J. H. BALDOCK.—Received too late for this issue.

A. ROGERS.—The address is Willis & Co, 2, Charles-street, Long Acre, W.C.

W. W. (York).—Kindly send fuller particulars. We will then endeavour to help you.

F. GUTEKUNST.—We have no further information about the apparatus than that referred to.

COPYRIGHT.—Send our publishers three copies of the photograph and one and sevenpence, and they will effect the registration.

SOUTH WALIAN.—1. You can copyright the photograph under the circumstances mentioned. 2. Send one and sevenpence and three copies of the print to our publishers, who will do the needful in the matter.

COPYIST.—1. You would be running very serious risks in copying the pictures. 2. See the Copyright Act printed in the 1897 ALMANAC. 3. To find out whether a picture is copyright, a search at Stationers' Hall is necessary.

CHARLES PARTINGTON.—We should think that the intensifier would work well under the conditions named; a preliminary soaking of the plates in water at a temperature of 75° would probably render them sufficiently permeable.

A. M. LUCAS.—In all probability you will be quite safe in copying the picture, but, to make absolutely certain, a search (fee 1*s.*) at Stationers' Hall would be wise. Copyright may exist during the life of the author and for seven years after his death.

CHOICE OF LENS.—W. MINN. The lenses of each of the makers named are in good repute. It is quite against our rule to recommend the goods of any particular manufacture. You may rely, however, on getting a good instrument from whichever of these you go to.

ADAPTUS.—J. R. COLMAN. If the small lens mount has the standard screw thread, any of the photographic opticians will supply an adapter to fit the flange of the larger lens, which, we know, has that thread. If the old lens has a different thread, a special adapter will have to be made.

HAIL-STORM DAMAGE.—TENANT asks who is liable for the repair of a studio, the roof of which has been "riddled with hailstones? I have the premises on a repairing lease, and I contend that, as the storm was an 'act of God,' the landlord is liable. That he denies."—He is right; you will have to do the repairs.

DISCOLOURED C. C. PAPER.—COLLODION. If the whole of the collodion chloride paper, from long keeping, has become as discoloured and mottled as the sample piece sent, it will be no use attempting to use it for vignettes, or indeed anything else, that is, if good results are expected. Better throw it away—the first loss will prove the cheapest in the end.

TRADE.—No. 2's offer is certainly fair and reasonable, and you would probably not do much harm in interviewing the gentleman. At the same time we are averse to actually recommending the payment of money in such cases, which frequently result unsuccessfully. Better have a personal interview before deciding. Of course, you would have an agreement of some kind.

STEREOSCOPIC PHOTOGRAPHY.—W. M. We will bear your suggestion in mind. The method was described in the 1887 ALMANAC, and has since been given in the JOURNAL. If, under the conditions you name, you get a true binocular effect, you must cross the axes of the eyes, *i.e.*, squint, which is, of course, not necessary when looking at a properly transposed and mounted picture.

SPOILT PLATES.—T. S. If what is sent is a fair sample of the lot, the plates are quite worthless. They have been exposed, for some time evidently, to damp. The round spots are simply mildew, and nothing else. Probably the vendor suspected they were faulty, or he would not have sold them for the price you gave. Some risk must be expected in buying "job lines" of dry plates.

SPOTTING COLOUR.—A TWENTY-EIGHT YEARS' READER writes: "Can you give me a recipe for spotting prints for enamelling—of course, I mean a medium that will not be removed by enamelling?"—If the prints be spotted with the ordinary tube oil colours, thinned with spirit of turpentine, the colour will not be removed when they are enamelled. Most of the large dealers supply special colours for the purpose. Apply to Mr. Rudowsky, 3, Guildhall-chambers, E.C.

POWDER PROCESS.—R. BELL writes: "I want to produce some pictures on glass by the powder process, and have used the formula No. 3, as given in the ALMANAC, but I cannot get on. My trouble is, that as soon as the colour takes it takes all over, and obliterates the image. What can be the cause?"—It is, no doubt, due to the bichromated film being too moist. The working of the dusting-on process depends entirely upon the hygroscopic condition of the film, and the atmosphere has been very damp of late. Try again; make the plate warm immediately before it is put on the negative, and then, when printed, warm it again to drive off any moisture it may have absorbed. Then conduct the development in a tolerably dry room.

TONING.—ANEMA asks: "How much gold is required for toning one sheet or one quire of P.O.P. paper? and should the toning bath for the P.O.P. paper be very weak? Will the prints turn yellow through insufficient gold?"—The amount of gold will depend upon the depth of tone required; the deeper that is, the greater will be the gold consumed. The subject is also a factor in the case. If they be vignettes, they will take less gold than if they are all "full-out" images. Again, all papers do not require the same amount of gold to get a given tone. Hence it will be seen that no definite quantity can be stated. If the toning bath does not contain sufficient gold to tone them, and they are left in long, the probability is that they will become yellow.

RELIEFS.—T. E. KLOOS (the Hague) writes: "As a constant reader of your paper, I should be very much obliged if you would give me information about any book wherein relief photography is described. Also I should be much pleased if I could obtain, from or by yours, the complete specification, &c., from the patent No. 2305, Relief Photographs, 'Improvements in Methods of Producing Photographs in Relief,' by H. C. Fairchild."—There is no English work specially devoted to the subject, but much upon it has appeared in back numbers of the JOURNAL. The specification named has just been published, and may be obtained on application at the Patent Office for 8*d.*, or post free on Form C, to be had at any English post office for the same amount. For postage abroad an additional 2½*d.* will be required.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

The Technical Education Board of the London County Council forward us a prospectus of the work undertaken by the Photo-process School, 6, Bolt-court, E.C. The work, under the direction of Mr. Charles W. Gamble, is sectionised into (1) Negative-making for the various photo-mechanical processes; and (2) Preparation of the printing surfaces for line blocks on zinc, tone blocks in copper and brass, photo-lithography in line and tone. The syllabus of each subject is exhaustively mapped out, and, to quote from the prospectus, the instruction is strictly practical, and the technology of each subject is dealt with as fully as possible. The various operations are demonstrated, after which students themselves are required to work under the guidance of the teacher. A definite course is laid down in the syllabus, and all students joining are required to adhere strictly to it.

* * *

The school appears to possess unusual facilities for the practical study of process work. The photo-process department contains a studio fitted completely with all necessary appliances, including excellent electric-light installation. It also possesses a sensitising room, a developing room, an intensifying room, a metal coating room, a printing room, a photo-litho room, and a press room, besides an etching room and a fine-etching room. There is also an enlarging studio for daylight enlarging (prints and negatives) up to 30 × 24, fitted with every necessary appliance.

* * *

The Technical Education Board lay emphasis on the difference there is between this school and an ordinary teaching institution. The school, they point out, is open to all who are genuinely engaged in any branch of the photo-mechanical, photographic, designing, lithographic, engraving, and printing crafts. The Committee are open to consider applications from parents who intend placing their sons as apprentices to any of the above trades, and who may be desirous of giving them a preparatory technical training; but it is to be understood that such students must be duly apprenticed within some period to be arranged with the Committee.

* * *

The fees are as follows:—For those craftsmen who may desire to devote their whole time for any period to work at the school, a special composition fee of 1*l.* a month is charged. This admits to the various classes, subject to the discretion of the teachers, and allows of practice during the hours when the school is open. This fee will be reduced by one-half for such students as are under twenty-one years of age and are dependent upon parents who are in receipt of less than 150*l.* a year. Students entering for one course only will be charged a fee of one guinea for one class a week for a period of twelve weeks; students entering for two courses will be charged 35*s.* for twelve weeks. Those taking more than two courses will be expected to pay the composition fee referred to above. Further particulars may be obtained either from the Secretaries of the Bolt-court School, Bolt-court, Fleet-street, E.C., or from the secretary of the Technical Education Board, St. Martin's-place, W.C.

* * *

Messrs. Wellington & Ward send us specimens of their new show-cards, upon which prints made on their matt bromide and Sylvio printing-out papers are mounted. The show-cards are tasteful in design and have a very effective appearance. It goes without saying that the specimen prints do the fullest justice to the processes by which they are produced. We learn with

pleasure that for the papers named, as well as for the firm's negative paper in cut sheets and spools, the enamo-glazed surface bromide paper, and a hand-made rough paper, a great demand has sprung up.

* * *

The Sandell Works Company propose holding at their works, South Norwood, an Exhibition of a large number of specimens of work on multiple film plates, by the Managing Director of the Company, Mr. J. T. Sandell. The subjects comprise Continental views, the halls of the city companies, and photographs of some of the best-known public buildings in London. The Exhibition will open on Tuesday, April 13, and will close on Friday, May 14.

* * *

We are indebted to a friend for drawing our attention to the following amusing paragraph, which recently appeared in the *Globe* :—

"A few weeks ago the *Academy* published an article upon Walter Savage Landor. A little while afterwards a letter was delivered at the office, addressed to Walter Savage Landor, Esq., care of the Editor. On being opened, it was found to be from a firm of West-end photographers. It ran :—

"'Sir,—We are very anxious to include your portrait in our "Series of Celebrities," and should be very pleased if you could kindly grant us a sitting for the purpose at your convenience, especially as only a few minutes will be required. We shall be happy to take you any time that you may be able to appoint, and we will, of course, send copies of the portraits for your inspection before making use of them in any way.—We are, sir, yours faithfully, ——.'"

The humour of the situation will be universally understood when it is pointed out that Landor has been dead thirty-three years.

CHASSAGNE'S COLOUR PROCESS DESCRIBED.

Too late for reference in our last issue we were enabled to peruse the specification of the patent which has been taken out in the names of Messrs. Dansac (deceased) and Chassagne for the process of producing photographs in colour that has recently been the object of attention at the Society of Arts and elsewhere. Our opinions upon the results produced by that process have been duly set forth and do not need recapitulation.

It will be remembered that Chassagne's process was described as based upon the property of selective colour absorption superinduced by (1) treating the plate upon which the negative was taken with a special solution ; and (2) treating the positive print with the same solution, the successive application of the blue, red, and green colouring solutions producing the natural colour effect on the print. There is, however, no reference in the inventors' description to the treatment of the negative or the unexposed plate with any special solution, so that we must assume a misconception to have arisen.

The process appears to consist in treating a silver print or glass transparency with five specially prepared solutions, the composition of which we shall briefly describe.

1. Shadows Albumen.—One thousand grammes of distilled water are heated to from 37° to 40° C., divided into two equal parts, and poured into separate vessels, to the contents of one of which are added 200 grammes of pure blood albumen, the mixture being well stirred each half hour for 3 or 4 hours. The solution is to stand for 24 hours. To the other 500 grammes of water there is added 1 gramme each of the following chlorides: platinum, sodium, cobalt, palladium, ammonium, iron, chromium, gold, tin, barium, nickel, strontium, cadmium, mercury, and silver. This remakable mixture is directed to stand, after "solution," for 24 hours in the shade. In another vessel 10 grammes of hydrochlorate of cocaine are added to 125 grammes of water, the cocaine having been previously exposed to light for 4 or 5 minutes. This solution is also to stand in the shade for 24 hours.

To the solution of albumen are now added 5 grammes of sulphate of soda, 1 gramme of oxalic acid, and 25 centigrammes of mercuric chloride. One hundred grammes of this mixture are taken, and an egg and a "pinch" of hemoglobine are well stirred into it, and then returned to the albumen solution to which the cocaine solution is also added. After thorough mixing, the solution containing the chlorides is slowly poured into the albumen solution, the combined mixture of albumen, chlorides, cocaine, soda sulphate, mercury, &c., being allowed to stand in the shade for 24 hours. This is the "shadows" albumen.

2. Relief Albumen.—To half of the mixture just described add 1 gramme each of picric and chromic acids, and 10 centigrammes of formic acid. Then in 125 grammes of distilled water dissolve 5 grammes of chloride of sodium, 1 gramme of chloride of platinum, and add 50 grammes of fresh caseine. Add this to the mixture containing the picric and chromic acids and allow to rest 24 hours.

3. Blue Pigment. — To 10 centilitres of shadows albumen are added 1000 grammes of distilled water in which 1 gramme of sodium chloride is dissolved ; to 100 grammes of this solution are added 5 grammes of carmine of indigo, and 5 grammes oxalic acid. The two solutions are then mixed.

4. Green Pigment.—To 1000 grammes of distilled water in which 1 gramme of sodium has been dissolved, 5 centilitres of shadows albumen, and 5 c. c. of relief albumen are added. In two flasks are poured 2 portions of this solution, equalling 50 grammes respectively. In one a gramme each of the chlorides of nickel, chromium and copper, 1 gramme of sulphate of copper, and 1 gramme of nitrate of copper are dissolved. To the other 50 grammes of solution 1 gramme of "carmine of indigo," and 1 gramme picric acid are added ; mix by adding the chlorides solution to the indigo solution and add to the remaining 900 grammes of solution. Agitate thoroughly several times and leave to rest for 24 hours.

5. Red Pigment.—To 1000 grammes of distilled water, in which 1 gramme of sodium chloride has been dissolved, add 10 centilitres of relief albumen. Take two separate quantities of 50 grammes each of this solution : to one add 1 gramme of sulphide of mercury (cinnabar), 1 gramme chloride of iron, 1 gramme sulphate of iron, 1 gramme acetate of uranium ; and to the other 5 grammes of sulphocyanide of ammonium. Mix the two solutions, add 30 grammes of fresh caseine, and then return the mixture to the 900 grammes of relief albumen solution. Well mix, and allow to stand for 24 hours.

The 5 liquids are to rest for 8 days, although a period of 3 or 4 months is recommended in preference.

The method of using these 5 solutions is briefly as follows : Take (1) 10 centilitres of shadows albumen, and add to 1000 grammes of distilled water, in which 1 gramme of sodium chloride has been dissolved, and (2) 10 grammes of relief albumen in 1000 grammes of distilled water, in which 1 gramme of sodium chloride has been dissolved. Apply the shadows albumen to the print, presumably by immersion,

and then the relief albumen. Next brush on blue pigment, followed by shadows albumen; green pigment diluted with shadows and relief albumen; relief albumen; red pigment diluted with relief albumen; and finally with shadows albumen.

The foregoing is substantially the inventor's description of the Chassagne "selective colour-absorption" process—a process the *rationale* of which, to say the least of it, is not obvious. Frankly, we are disposed to regard this very extraordinary method of colouring photographs here outlined as either a hotch-potch of empiricism and mere chemical guesswork, or a strangely complicated and involved description of what, judging by the results that have been shown, is possibly a promising process for producing photographs in colours. For the present, however, we reserve further comment, and will await with interest the results of any practical experiments on the lines laid down by the inventors.

A Good Price for a Portrait.—At an auction sale, one day last week, of an amateur's collection, Messrs. Robinson & Fisher obtained the substantial figure of 3350 guineas for *A Portrait of a Gentleman*, dated 1679, by Franz Hals. It is seldom that a portrait subject realises so large a sum as this.

The Projected Balloon Voyage to the Pole.—According to *La Nature*, M. Andrée will attempt his trip to the North Pole about the end of June. This year he has the hearty support of the Swedish Government, and will be taken to Spitzbergen in a Government vessel. The Canadian Government have been notified of the fact, and have undertaken to report any place in the North-western territory, or the Hudson-bay region, where the balloon may be sighted. We can only reiterate what we said last year, We wish M. Andrée *bon voyage* and a safe return.

Photography and the Boat Race.—At no annual festival, perhaps, are so many hand cameras to be found as at the Oxford and Cambridge boat race, and so comparatively few good results obtained. This year the light, at the time, was as exceptionally disappointing to photographers as the temperature and wind were unpleasant to visitors generally. We know that preparations were made by "animatographers" to secure pictures of the event, but we have not yet heard the results obtained. Although fully exposed pictures may have been secured, they must, necessarily, lack the brightness and sparkle they would have possessed had they been taken in bright sunshine.

An Ingenious Theft of Pictures from a National Gallery.—It is reported that two pictures, one of them reputed a Murillo, have been stolen from the National Gallery at Buda-Pesth in a very ingenious way. The paintings were taken out of their frames, and common oleographs substituted in their places. It is said the pictures were stolen while there were visitors and copyists about. As the theft was, so it is said, successfully carried out, and no trace left behind, the authorities of our own National Galleries need be on the alert. On students' days there are many copyists at work, and, intent upon that alone, many canvases moving about and but few visitors. Further, there are reproductions of many of the pictures, the same size, which could be coloured, and, if substituted, would possibly not be detected till some little time after the thief had got away, as in the case at Buda-Pesth.

Finders.—At a recent meeting of the Photographic Club, when the question of finders was under discussion, a point we have more than once called attention to was animadverted upon, namely, the accuracy of the adjustment of finders on hand cameras. Unless the finder fairly represents the same amount of subject that is included by the lens on the camera, it fails in its object. But that is not the worst part of it, as it more often than not is not truly, either vertically or horizontally, adjusted to the axis of the camera lens; that is to say, the finder points one way and the lens another. If one takes, say, half a dozen hand cameras, as found in the market, and fixes them one by one on a stand, and places a focussing screen in the place of the prepared plate, it is doubtful if the centre of the image, as shown on either of the two finders, coincides with that on the ground glass. If by chance it does so when the camera is placed horizontally, it will not do so when placed vertically. Both finders should not only include the same amount of subject as the lens, neither more nor less, but their axes should also be parallel to that of the lens, or they are misleading, as one does not get in the negative what was shown in the finder. This defect is not of such moment when only lantern-size pictures are required and quarter-plates are used, for then there is a good margin for trimming; but the case is very different when the full-size picture is desired.

It was mentioned by one of the speakers that the question of accurate adjustment was simply one of cost—in fact, the time of a skilled man to do the work, which might be from six to ten shillings on each instrument. When this is taken into account, the inaccuracy one so generally sees in the finders of hand cameras is readily accounted for, particularly at the low prices some purchasers expect them for. One must not look for very precise adjustment of the two finders on a guinea hand camera, nor, indeed, on one of three times that price; but the unfortunate part is, that we do not always get it on the highest-priced instruments.

British Art during the Queen's Reign.—One of the finest collections of British art that has probably ever been got together is now open at the Guildhall Art Gallery. It is a loan collection of works by British painters who have flourished during the Queen's reign. There is no question that this will prove the most interesting of all the exhibitions held by the Corporation. The money value of the art treasures shown is estimated at considerably over 300,000*l.*—though the money value of paintings must not always be taken as the actual merits of the works themselves. From a hasty glance round the Exhibition we can assure our readers who visit the show—and who will not?—that there is an artistic treat in store for them. The Exhibition will remain open for a period of three months, daily, from 10 till 7, and on Sundays from 3 p.m. until 7 p.m. There has always been a strong opposition, on the part of some members of the Common Council to opening the Exhibition on Sundays, but that is decreasing year by year. The Exhibition is open free, as the City Corporation does not believe in "gate money."

While on the subject of Sunday opening, it may be mentioned that the National Gallery and the National Portrait Gallery are now open again on Sundays, the former from 2 till 5, and the latter from 2.30 until 5.30 p.m. The Sunday opening of our art galleries ought to be a boon to a large number of photographic assistants, whose avocations will not permit of their visiting the galleries to study the works of the great masters on week days. But we fear that a less number avail themselves of the opportunity than would be supposed, considering the advantages they would gain by so doing. As proving that Sunday opening is appreciated, it may be mentioned that during the two or three hours the museums were open on the twenty-eight Sundays—September 20, 1896, to March 25, 1897—only a few short of 45,000 persons visited the South Kensington Museum, and more than half that number visited the Natural History Museum. Why, then, it may be asked, cannot arrangements be made for keeping our National Art Collections open for two or three hours on Sundays in winter as well as in summer?

BY THE WAY.

PERIODICALLY we have great questions raised—great at least, if measured by the fuss they make for a time and the space they fill, like the *Daily Telegraph* "stop-gaps" in the silly season. By the way, the latest *D. T.* idea beats anything it has hitherto attempted, and the daily "Directory" of the *employés* of the principal London business houses, wholesale and retail, ought to be useful to some one, but it is a great eyesore to the ordinary reader.

I repeat, we have at intervals discussions on all sorts of absorbing subjects. The "Amateur Question" is a good one, and bad to kill; "Copyright in Photography" is another that may be studied from a variety of standpoints; "Photographers' Charges," and any number more. But, oh, what a dreadfully contentious subject is that which Mr. J. E. Shaw proposes, in last week's JOURNAL, to have threshed out!

"What is artistic photography?" Personally I give it up, for several reasons, first and chiefest because I believe it has been said that he who talks art in photography makes a fool of himself; and, secondly, because it is so manifestly easy to decide the question satisfactorily for yourself, but so difficult to convince others. Leaving photography out of the question altogether, "What is art?" It would be difficult to answer the conundrum in its broadest sense, and still more difficult when it is narrowed down within the bounds of camera work. Let us devoutly hope that we are not going to have the JOURNAL swamped for the next few weeks with the old, old arguments, and the ancient and worn-out dissertations with which we were so familiar in the photographic journals five-and-twenty years ago, when the facilities afforded by photography to even the cleverest worker were as nothing to those possessed by the veriest "duffer" of to-day.

It is a somewhat remarkable thing that, when a *photographer* begins to talk about art, he at once becomes "great" on the subject of *chiaroscuro*, "breadth," "balance," and lots of other things that he finds it difficult to explain if really cornered; he talks about the "canons of art" and the importance of not departing therefrom, and branches off into such minor subjects as "pyramidal form," as if the Almighty had used nothing but pyramids in the creation of the universe. And what does it all amount to at the finish? What more does any one understand who has listened to or read the whole passage? I remember sitting through a meeting of the old South London Society many years ago, and the subject for the evening was an "art" one, with blackboard illustrations; and, although the lecturer exhibited an amount of skill that would have ensured him a handsome income at "the halls" as a "lightning delineator," and was heartily applauded for the rapid and accurate manner in which he sketched from memory the salient points of many well-known pictures, I am bound to say that the general tone of the evening's performance was decidedly comic, and that "chaff" and badinage rather than a serious consideration of "art" were the order of the day.

But, when an artist, *i.e.*, a trained artist, not a photographic one, tackles art, it is equally remarkable how careful he is to steer clear of all the very things the photographer is most anxious to drag in. You don't find him, as a rule, rubbing the "canons of art" into you, for the simple reason, I dare say, that he knows enough of his subject to be aware that no two persons agree as to what constitutes strict "canons." The very term "art" he treats with a tenderness and shyness that come of a feeling and acknowledgment of how difficult it is to say where art begins and where it ends, or what it consists in. Go back no further than the recent meeting of the Royal Photographic Society, when Mr. W. L. Wyllie, A.R.A., chose as his subject *The Making of Pictures*. A less shoppy and a more practical demonstration of art, without calling it art, has perhaps seldom been given before a photographic society, and Mr. Wyllie was undoubtedly correct in saying that the course he adopted would prove more useful than if he "talked for weeks" on an artistic subject. For the rest, instead of talking about chiaroscuro, light and shade, "breadth," "atmosphere," and other matters over which, if he understand them, the photographer has little or no control, he confined himself almost entirely to the more mechanical side of picture-making comprised in perspective, that side which, although, if he will, the photographer has under his mastery, he too frequently leaves entirely to itself.

But there is, undoubtedly, an improvement apparent in art photography during late years, and, if there is a good deal of nonsense talked and written, there is, at the same time, a great deal of really good work turned out without any accompanying fuss. This is, of course, only what might be expected from the vastly increased facilities that modern plates offer; perhaps the chief wonder is why the proportion of good work is not greater, or, indeed, why any bad work at all should, if executed, be allowed to appear. But this takes me back to the subject on which I started, Mr. Shaw's letter and question, "What is artistic photography?"

In the first place, Mr. Shaw's ire seems to have been aroused by the irresponsible utterances of a modern feminine magazine writer whose chief business is to "make copy." Never mind the opinions expressed in Mdlle. Beloc's article, but let us confine ourselves to the pictures referred to. I may say I was personally never an impressionist, or fuzzytypers, and have also run more in the direction of *f*-64 than full aperture. Consequently, I always looked upon Mrs. Cameron's photographs, as I did on most of Rejlander's, as bad *photographs*, but some of them good *pictures*. The former they undoubtedly were; the latter may, of course, be open to opinion but whether they are artistic is, of course, also purely a matter of opinion. We may sink the rubbish quoted in Mr. Shaw's letter about giving "her soul to her sitters," and sum up Mrs. Cameron's success in her own words: "Famous people often make the best sitters." Yes, it was her sitters chiefly who made the pictures, and, after that, the friendly critics. However, in the old days, the art photographer left it to others to proclaim him. Now, as a rule, he proclaims himself, and that pretty loudly too.

I wonder why, when a person wants to say something funny, he tries to do it in poetry. I have received some doggerel, from a correspondent dating from Crewe, on the subject of Mr. Wallace Bennetto's colour photographs; but, whether it is intended to be complimentary or the reverse to Mr. Bennetto, or whether it is a "cut" at myself, or what it means, I can't discover. The old proverb says, "Poeta nascitur non fit," and I quite agree with the later sage who says that, even when born, they are not *fit* to live, some of them certainly not to have the use of the penny post to propagate their silly effusions.

DOGBERRY.

FOREIGN NEWS AND NOTES.

Calcium Carbide.—Dr. Büchner has come across a substance which was sold to him as carbide which, on treating with water, gave off very little acetylene. On breaking the lumps up, and treating with hydrochloric acid, a jelly was formed without the evolution of carbonic acid, showing that the lumpy material was not undecomposed chalk. Büchner comes to the conclusion that this so-called carbide was made from a material which contained a lot of silica and very little chalk, and therefore only small quantities of true calcium carbide were formed.

Alumtypie.—In the current number of the *Photographisches Centralblatt*, Fleck describes, under the above title, an aluminium printing process which is stated to have given the most satisfactory results. It is a direct asphalt printing process, and Fleck states that the asphalt used by him is so sensitive as to give a vigorous print in ten minutes in the sun, which requires no auxiliary exposure or heating. Two etching fluids are used. No. 1 consists of

Hydrochloric acid	25	parts.
Nitric acid	25	„
Saturated solution of salt	50	„
Strong solution of gum arabic	25–50	„

For large prints, 25 parts of sulphuric acid are added to the above. This etching solution is allowed to act for from three to five minutes. the plate is then washed, excess of moisture removed, and the print rolled up with equal parts of printing and litho ink diluted with varnish. The plate is then warmed and dusted with resin powder,

rubbed over with talc powder, and then etched in No. 2 ion of

Ferric chloride solution (35° B.)	100 parts.
Strong gum solution	10 „

k uses the gum solution only as a diluent of the iron. The ink-lling property of the gum as used for stone and zinc work is nced much more efficiently by the chloride of iron, which he s he has used for some time for lithographic work on stone. second etching solution is allowed to act for the same time as first, and the plate then washed and dried, and treated with the wing solution:—

Powdered Syrian asphalt	8 parts.
Chloroform or benzole	50 „
Oil of turpentine	50 „
Oil of lavender	3 „
Dye	0·5 „

dye is used to enable the image to be seen better, and to enable to judge better of the etching. The plate is prepared for ting, and it will give a long run by using

Water	160 parts.
Phosphoric acid	9 „
Gallic acid	25 „
Tannin solution (1:3)	35 „

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lackening Brass. — Fleck recommends, in the *Photo-hisches Chronik*, the following new method of blackening brass. n the brass well, and dip into a mixture of—

Water	100 parts.
Ferric chloride solution (40° B.)	50 „
Yellow prussiate of potash	5 „

n wash in water, and heat and rub over with linseed oil, and ph with a soft cloth.

.cetylene.—Dr. Büchner states that, with proper treatment under ordinary pressure, acetylene is no more dangerous than nary coal gas. The Internationale Gesellschaft für Beleuchtung, erlin, now makes burners for acetylene of 25, 40, 60, 80, 200, and candle power. The absorption of gas by water, or its easy de-position by it, is considerably lessened if from twenty to thirty cent. of common salt is added to the water of the gasometer.

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odine as an Accelerator in the Hydroquinone eveloper.—M. Cousin states that the addition of iodine in small ntities to the hydroquinone developer gives much better blacks romide paper, and, in large quantities, makes the image appear e quickly, and gives much flatter results. The iodine water is le as follows:—

Potassium iodide	5 parts.
Iodine	1·5 „
Water	15 „

hen dissolved, make up to 250 parts with water. The particular eloper he recommends is:—

Hydroquinone	1 part.
Anhydrous sodium sulphite	4 parts.
Saturated solution of soda carbonate	10 „
Ten per cent. solution of potassium bromide	3 „
Water	100 „
Iodine water as above	3 „

PERIMENTS ON THE SENSITISING POWERS OF VARIOUS COAL-TAR DYES FOR GELATINO-BROMIDE PLATES.

ERIES of experiments have been made by E. Valenta on some of the ver green, blue, and violet coal-tar dyes obtained from Beyer, of berfeld; Lucius and Brunning, of Höchst a/M.; Casella, of Frank-t; Durand, Huguenin, & Co.; Seigy, of Basle, as to their value as ical sensitisers. The experiments were made with a spectroscope and light, as most of the photographic work is done by daylight, and be-se the Frauenhofer lines are convenient for determining the various ions of the spectrum.

In consequence of bad weather, tests were also made with a Siemens enerative burner of 30 c.p., and a sodium flame to give the D line.

The experiments were always carried out as follows: with a constant distance of the burner from the slit of the spectroscope, and equal width of slit and by bathing the plates for 3 minutes in the dyes to be tested and then exposing the plates for 5, 10, 30, 60, and 300 seconds, and, in order to determine the relative sensitiveness of the blue-green of the spectrum, an ordinary bromide plate was also exposed for the same time.

The diamine dyes, diamine blue, diamine green, diamine steel blue, diaminogen blue, diaminazo blue, obtained from Cassella & Co., proved useless for sensitising, as they only gave a faint continuous spectrum, without any action or vigorous band in the yellow, green, or red parts of the spectrum.

The blue dye, naphtindon, 2 B, obtained from the above firm, produced strong fog, even in a concentration of 1:20,000; still, with continued exposure, there was a distinct band from C to C $\frac{3}{4}$ D. In very dilute strength (1:200,000) it acted better, but was practically of no use since the general sensitiveness was lowered, and the band does not appear strong. Exactly similar acted another dye from the same firm, methylindon B in great dilution, 1:200,000 to 1:500 000, and showed a band between *a* and B, but the general sensitiveness was strongly reduced.

Rosindulin, obtained from Kalle & Co., has been experimentally placed on the market. This, or its sulphonic acid, possesses the property of staining silver bromide only slightly; but, in spite of this, as well as some of its derivatives, which possess this property, it acts as a sensitiser, and sensitises for the yellow and yellow-green rays from D to D $\frac{1}{2}$ E (maximum D $\frac{1}{2}$ E). The disulphonic acid of the rosindulins, which is known commercially as azocarmine, is soluble in water of the alcohol, with a bluish-red colour, and this solution, in very dilute state (1:200,0000), with the addition of ammonia, acts as a sensitiser, and gives a faint band in the red from A to *a*, and also a second one at D $\frac{1}{3}$ C.

It should be noted that azocarmine may be combined with eosine, and, by using a very small quantity of eosine, with sufficient exposure, gives an almost closed spectrum at D, with the second maximum from A to *a*.

In greater strength the azocarmine acts worse, and, in the proportion of 1:10,000, no longer gives a maximum, and, even with long exposure a faint, continuous, foggy spectrum

Naphtaline blue and naphthaline violet act better than rosindulin and azocarmine. These dyes are placed on the market by Kalle & Co. in the form of a dark brown powder, are derived from naphthaline red, and may be considered as phenyl derivatives of this body.

The action of the two dyes on the gelatino-bromide plate is almost the same. With the former, in a dilution of 1:200,000 to 1:400,000, a band from D to over C appears, which fades off very weak to the refrangible side; the maximum lies between C and D.

With naphthyl violet in the same proportion the sensitising band reaches from C $\frac{1}{3}$ B to beyond D. Magdala red, which is allied to this dye, has been tested by Eder, and it gives a maximum at D, which, with long exposure, gives a faint action in the green.

Azindon blue G, which is also allied to these dyes, lowers the general sensitiveness of the plate, even in great dilutions, and causes fog, whilst Azindon blue R gives, in very dilute solution (1:200,000–1:400,000), a very faint, indistinct band from A to D, whilst in a concentrated solution it shows no sensitising action.

The red benzidine dyes—Congo, benzo-purpurin, Bordeaux extra, and naphthol red—were tested by Dr. Eder, and, by using ammoniacal baths, he obtained very good results. Eder found that these dyes only increased the sensitiveness of the silver bromide from the green to the orange, to the green, or from D to E.

Congo rubin, which was obtained from the Berliner Actiengesellschaft für Anilinefabrication, showed, with a long exposure, a broad sensitising band, which was very vigorous, and had a maximum at D. It reached from C to D $\frac{2}{3}$ E, and this dye, which sensitises further into the red than the other, and which does not lower the general sensitiveness much should be of some practical value.

The following was found to be the best formula:—

Dry solution, 1:500	10 c. c.
Ammonia	2 „
Water	200 „

With long exposure one obtains a closed band from the violet to the red beyond C, with a faint maximum at E.

Other dyes of the Congo series tried were Zambesi blue B and Chicago blue B. The former gives, in a bath of double the above strength, a faint band in the infra red beyond A, and a vigorous broad band from *a* to D $\frac{1}{5}$ E. Chicago blue showed a similar action, only weaker.

Several dyes which were supplied by the Berlin Actiengesellschaft

proved to be sensitisers. Violet P is, according to the manufacturers, the hydrochlorate salt of tetramethyldiamidotrioxytriphenylcarbinol and a derivative of pyrogallol. It produces hardly any action in a strength of 0·25 per cent. of a 1 : 500 solution; but, when used forty times this strength, with a long exposure, it shows a sensitising band from C to C ¼ D, but at the same time there is a tendency to fog.

Violet D P, when used in a bath of 10 c. c. of a 1 : 500 solution, strongly lowers the general sensitiveness; but, when only 0·5 c. c. in 200 of water are used, shows a vigorous band from D—E, and a fainter band from D ½ E, whilst the general sensitiveness is very little lowered.

Violet R acts badly when strong, but when used more dilute there is shown a vigorous band from B to D ¼ E, which with short exposure is resolved into two maxima, one at C, the other at D.

Tetraethyldiamidooxytriphenylcarbinol gives, when 0·5 c. c. of a 1 : 500 solution and 200 c. c. of water are used, a vigorous band which begins at B and reaches to C ¾ D. With long exposure in sunlight, the action extends beyond A into the infra-red.

In combination with extraordinarily small quantities of eosine (0·01 of a 1 : 500 solution eosine, 0·5 solution of the dye, and 200 c. c. of water), plates are obtained which work well in the orange-red, yellow-green, and blue.

The diamido compound works less favourably, and shows a faint band at D ¼ E, and signs of one between D and E.

A dimethyl compound gave no result, and the same was found with firnblue and hydroline acid violet 5 B from Beyer when used in almost any strength, and, with the addition of two per cent. of ammonia, gave a sensitising band, with full exposure, from C to D.

Lucius and Brunning have introduced a diazo dye from diamido-phenylazindobenzol which sensitises for red, the best action being obtained with a bath of 15 c. c. of dye 1 : 200 and 200 c. c. of water, and, with sufficient exposure, a vigorous band was obtained from A to C ¾ D. Patent blue and wool green had but little sensitising action, and depressed the general sensitiveness. Casella's cyanol and azo green produce continuous sensitising action. Acridine yellow and acridine orange have already been reported on by Dr. Eder.

Alizarine green S, when in a strength of 4 grammes in 500 c. c. water and enough ammonia to dissolve, and diluted to 1 : 50 or 1 : 100, sensitises very vigorously from A to C ¼ D. Unfortunately the ammonial solution of dye does not keep.

Biebericher indigo B, made by Kalle, shows a vigorous band from C to C ¾ D, and a fainter band at D ⅓ E. The presence of a very small quantity of silver nitrate acts favourably. The best strength is 0 5 c. c. dye (1 : 500), 2 c. c. ammonia, 2 drops of ten per cent. silver nitrate, and 200 water.

The azin greens G and T O lower the general sensitiveness very much, and give no colour sensitiveness. Cressyl violet B B A gives a band from C–C ¾ D, but lowers the general sensitiveness a good deal.

Neptune green S, from the Badische Aniline und Soda Fabrik, in a strength of 20 c. c. (1 : 500), water 200 c. c., gives a strong maximum at C, and lowers the general sensitiveness but slightly.

Eriocyanine and erioglaucine, made by Geigy, of Basle, when used 20 c. c. (1 : 500), water 200 c. c., sensitise for red from about D ½ C to C ¾ D.

EXPOSURE AND DEVELOPMENT.

[Read before the Photographic Section of the Croydon Microscopical and Natural History Society.]

It may seem somewhat presumptuous on my part to bring a subject like this before the members of our section, many of whom are older and more experienced photographers than myself; still I trust there may be some present who may be able to pick up a hint or two, either from the paper itself or from the discussion to which I hope it will give rise. Having selected the plate to be used (and here I would, at the very outset, advise that, whatever plate is selected, it should, except for special purposes, be adhered to; I consider it a mistake to do what so many amateurs do, *i.e.*, try every plate and every developer they see advertised, uniform results can never be obtained in this way), and it matters little what plate, because most of those on the market are reliable, but by preference a slow plate—rapid plates, besides being more difficult to deal with, are only required for snap-shot, certain studio, and dull weather work—the first thing to do is to give the "exposure," and here it is that the difficulty comes in, because so many causes combine to render the correct exposure a matter of uncertainty. Nearness or distance of objects, their colours and contrasts, the time of day and of the year, and, above all, the ever-varying character of the light, have all to be considered before an exposure is made. Actinometers and exposure tables are very useful adjuncts, and I would say with regard to these, as I have said about the plates, Use one form of actinometer, or one set tables, and stick to them; do not buy every actinometer that is brou out, obtain a thorough knowledge and understanding of both plate a actinometer, add to these judgment or intuitive perception, or whatev you like to call it, derived from experience, and the appearance of t image on the ground-glass screen and the exposures are not likely to far wrong. Should, however, the exposure be at fault, then "develo ment," which I shall consider presently, may be employed to remedy t defect. It is stated in the text-books as a golden rule, "To expose f the shadows, and let the high lights take care of themselves," whi means that in exposing on dark foreground shadows, on dark green tre heavy foliage, dark red buildings, and the like, will necessitate a long exposure than lighter, brighter, or more distant objects.

It must also be remembered that short exposures give great contrasts, while longer exposures soften the contrasts; and, if you shou happen to be in such a place, for instance, as Cornwall, where whit washed hbuses are common, this should not be forgotten, or very ha black-and-white negatives will be the result. I must also direct attenti to a fact often overlooked, even if not sometimes unknown, that, using an actinometer, it should be used as far as practicable at the poi where the object to be photographed is situated, and not, as is usual done, at the point where the camera is set up, because what you want do is to test the light proceeding from the object to the lens, and not t light surrounding the camera. This can generally be done with objec near the camera, but not with distant objects, such as panoramic view indeed, it is not necessary in these latter cases. I should state, too, th in using the actinometer the instrument should be shaded by somethin such as the body of the photographer, if the sun is shining, but it shou not be exposed to the direct rays of that luminary. In all cases it shou be made a rule to make full notes of every exposure, such as time of yea time of day, character of subject, character of light, stop used, duratic of exposure, and character of negative obtained, as by this mea comparisons can be made, and, what is more essential still, experien can be gained, which will prove invaluable in the future.

I now come to "development," and a pertinent remark has been ma by, I think, Mr. Harrison, in his little book entitled *Photography for Al* to the effect that "let who will make the exposure, so that I develop th plate." This is as much as saying that there is very little in "exposure but everything in "development," and in such a statement I shou feel disposed to agree, with this reservation, *i.e.*, that the exposure ha at least been sufficient, because, while you can control, to a very gre extent, an over exposed plate, it is a waste of time to attempt to do an thing with a seriously under-exposed plate. Having decided upon th brand of plate to be used, note the formulæ required to develop it, an make up these as far as possible in the form of ten per cent. solution knowing the number of grains or minims of each ingredient required fc each ounce of developer. If, as has been so often pointed out, plate-make would only give these figures instead of the almost impossible formul they do give, much time and trouble would be saved. However, thank to Messrs. Clark & Ferrero, *vide* British Journal Almanac, 1890, an more recently to Mr. R. Child Bayley, *vide Pho ographic News*, Februar 26, and March 5, 1897, who have so kindly worked out some of the puzzles for us, I think we may now very well rest content. Althoug distilled water is not absolutely necessary, it is as well to use it if possibl and so avoid the deposit of lime, which always occurs when hard water used with the alkaline developers. Having dusted the plate and place it in the covered developing dish, prepare the requisite quantity developer, having sufficient to well cover the plate, and pour it with gentle sweep all over the plate, noting that every part of the film wetted by it, and that there are no air bells; if these last should form get rid of them at once by touching them either with a camel's-hair brus or the tip of the finger. Some operators moisten the film with water f about a minute before applying the developer; I do not, neither do I co sider it necessary, as air bells are more likely to be formed by doing s than not, owing to the presence of dissolved air or carbon dioxide in th water. Watch carefully the effect of the developer on the plate. If th image rushes up suddenly all over, over-exposure; if the image appear gradually in about a minute, correct exposure; if the image shows n signs of appearing in, say, two minutes, under-exposure—presuming, c course, that cold is not the cause; the temperature of the solution shoul be about 60° F.

On the whole, especially if dealing with unknown exposures, it i better to adopt the tentative method, that is, to add the accelerator whether it be potash, soda, or ammonia, gradually, beginning, say, with one half, and adding more according to the action observed. It may b noted that increasing the reducer, and decreasing the alkali, both tend t increase the contrasts, while reducing the reducer and increasing th alkali both tend to lessen the contrasts. In the case of portraits, these being taken, as a rule, in a studio where the light and exposure are pretty accurately known, the developing conditions would be to use a developer weak in pyro, but about normal amount of alkali, so as to ge a soft image up quickly and so avoid hard contrasts. What exactly takes place when a film of silver bromide in gelatine is exposed to light i not known for certain, but is supposed to be a chemical reduction, this reduction taking place in proportion to the light which has fallen on to the film; sea and sky will, therefore, effect a greater reduction than

would dark foliage or a red building. When the developer is poured over the plate, it immediately begins to attack the reduction product, metallic silver being the result; by allowing the reducer to go on acting, reduction continues as long as there is any reduction product to decompose, the image growing and increasing in density by accretions from below, being fed by the unaltered silver bromide where this comes in contact with the newly reduced (nascent) metallic silver. Two very interesting experiments in this connexion I may refer to, *i.e.:* (1.) By Captain Abney, who took a dry plate and exposed it in the camera, coated one half with collodio-bromide emulsion, and developed it as usual; the coated half was much denser than the uncoated, and what was still more extraordinary was the fact, that on separating the two films an image was found on the collodio-bromide film which had not been exposed at all, as well as on the gelatine film, showing that the image had been fed from both above and below. (2.) Dr. Eder coated a plate with a great thickness of gelatino-bromide emulsion, exposed, and developed it as usual, and found that the reduction of the silver bromide had taken place under the illuminated parts of the film throughout its whole thickness, showing that reduction, commencing on the surface, had spread downwards, just as in Captain Abney's experiment it had spread both upwards and downwards. As light could not have penetrated a film purposely made so thick as to be opaque, both these experiments are, at least, suggestive, if not demonstrative, of electrolytic action. A few simple experiments and a diagram or two will serve to show the action of reducing agents, with and without potassium bromide, on the haloid salts of silver, and I have written out a table on the blackboard, showing the leading properties and peculiarities of all the developers in use at the present time, which, I trust, may prove of use to some of you. J. H. Baldock, F.C.S.

PRINTING ON TEXTILE FABRICS.

This is a process for photographing upon porous or absorbent surfaces or fabrics, such as silks and similar materials, in such manner that the photograph or print constitutes an indelible dye, penetrating and permeating the tissue or body of the fabric itself, so that with thin fabrics the print is practically the same on both sides.

"To this end," says the patentee, Mr. J. Liddle, "my invention consists in preparing the fabric to receive the print by the use of materials soluble in water, which are afterwards washed entirely out of the fabrics, leaving the print as a permeating dye in and upon the same. I prefer to do this in the manner and with the means hereinafter described.

"The fabric is first soaked for ten or fifteen minutes in a translucent, presensitising preparation, composed of gum arabic, 4 grammes; salt, 1 gramme, dissolved in 123 cubic centimetres of distilled water. The fabric is then thoroughly dried and floated face down, for from two to five minutes, according to the atmospheric temperature, upon a sensitising solution composed of 10 grammes of nitrate of silver dissolved in 80 cubic centimetres of distilled water. The fabric is then dried a second time, and is ready to receive the print.

"The process of printing is substantially the same as upon albumen paper, but with relatively longer exposure, that is to say, the exposure should be continued until (with moderately thin fabric) the print is as deep on the back of the fabric as it is desired to appear on the face after the subsequent processes of toning and fixing. The print is afterwards completed in substantially the ordinary manner.

"As a modification of my improvements, I employ as one ingredient of the composition a non-mercuric chloride which is soluble in water, and in which the chlorine has a stronger affinity for the silver in silver nitrate than it has for its own base or the bases for each other, and which will therefore combine with the sensitising silver nitrate of the bath. Is is also necessary to use as a vehicle for this chloride a translucent gum also easily soluble in cold water and quickly drying, by means of which the chloride is held, as it were, in suspense in the mass of the gum in and upon the fabric, so as to be acted upon by the silver nitrate in the sensitising operation. When the fabric, after treatment with this solution, is floated upon the sensitising bath, the gum is softened so that the silver nitrate of the bath penetrates the mass of the gum and the tissues of the fabric, and unites with the chlorine of the chloride, and is transformed upon exposure to the light into an indelible dye, permeating the fabric. The materials best adapted for this purpose are gum arabic and sodium chloride, both being inexpensive and readily soluble in water, the solution thus made being transparent and the dried mass translucent. The composition is compounded in substantially the following proportions: Gum, 3 scruples; chloride, 15 grains; and distilled water, 4 ounces. The fabric is first soaked in this solution, then dried, floated upon the sensitising bath, again dried, and then printed upon, after which the gum is thoroughly washed out of the fabric by means of cold water, leaving the print dyed in the tissues of the fabric."

The claims are:—

1. The herein-described process of photographing upon a porous or absorbent fabric, consisting in first treating the fabric with a presensitising composition, containing gum arabic and a chloride, then sensitising the same, then subjecting it to the printing process, and then washing it until the water-soluble portion is entirely removed.

2. The process of producing positive photographs in and upon a fabric, consisting of first preparing the fabric with a solution of gum arabic and salt, then sensitising it by means of a solution of nitrate of silver, then exposing it for the production of the photograph, then washing away the solutions, then developing, toning, and fixing in the usual manner.

3. The herein-described improved photographic process, consisting of first soaking the fabric in a solution of gum arabic and salt, then drying the same, then floating it upon a solution of nitrate of silver, then drying the same, then printing and washing away the solutions.

4. The herein-described improved process of photographing upon a porous or absorbent fabric, consisting of first treating the same with a solution of gum arabic and salt, then sensitising it with a solution of nitrate of silver, and then drying, printing, and washing the same.

5. The herein-described composition of matter for preparing textile fabrics for receiving positive photographic prints, consisting of water, a translucent vegetable gum soluble in cold water, and a non-mercuric chloride also soluble in cold water, the chlorine of which has stronger affinity for the silver in silver nitrate than it has for its own base or than its base has for the silver of the nitrate.

6. The herein-described composition of matter for preparing textile fabrics for receiving positive photographic prints, consisting of water, a translucent vegetable gum soluble in cold water, and sodium chloride, in substantially the proportions specified.

7. The herein-described composition of matter for preparing textile fabrics to receive positive photographic prints, consisting of water, gum arabic, and a non-mercuric chloride soluble in cold water, the chlorine of which has stronger affinity for the silver in silver nitrate than it has for its own base, or than its base has for the silver of nitrate.

8. The herein-described composition of matter for preparing textile fabrics to receive positive photographic prints, consisting of gum arabic sodium chloride, and water.

LUMIÈRE'S IMPROVED APPARATUS FOR ANIMATED PHOTOGRAPHY.

The original apparatus on which that now under notice is an improvement is described in the Journal of February 7, 1896.

Fig. 1 is a front view of the improved apparatus.

Fig. 2 is a horizontal section on the line, x, y, of fig. 1.

Fig. 3 is a vertical section on the line, u, v, of the same figure.

The riband, R, is, as described in the specification of the aforesaid patent, moved by a fork mounted upon a slide, D, having an alternating vertical movement imparted to it by a cam, B, fixed upon the main shaft, A.

The points, a, a, of this fork enter lateral perforations in the riband during its descending motion, whilst they are removed from it during its upward motion, these movements being given to the fork by inclined planes, g, g^1 turning with the shaft, A.

It is preferred to give to the perforations of the riband, R, the form of notches, as shown in the drawings, which permits the fork to act upon the riband even when the shrinkage of the film, of which it is formed, has reduced its width.

The form of the cam, B, gives to the riband a rapid descent, and a time of complete rest equivalent to about two-thirds of a complete revolution; it would be impossible to pass beyond this limit with the cam, although, for perfection of exposure and for viewing, it would be very advantageous to still further increase the times of rest of the riband. This effect is obtained by giving to the shaft, A, which carries the cam, a motion of periodically variable speed, increasing during the descent of the riband, and decreasing during the rise of the fork, at the moment when the riband is at rest. For this purpose an eccentric pinion, S, is fixed on the shaft, A, and this pinion is driven by a wheel, S^1, of undulated shape, the axis of which carries the driving pulley, V. In the position shown by fig. 1, the slide, D, being at the centre of its downward motion, the pinion, S, driven by its smallest radius, possesses its maximum speed, which will be at its minimum after a half revolution, during the rise of the slide.

The periodical work of moving the riband is partially equilibrated by the weight of the slide, D, and if required by the action of a spring, X, pressing upon the upper part of this slide.

When the riband, R, in unwinding from the roller, P, has received or exhibited successive images by passing behind the window or opening I, it is desirable for its preservation and to facilitate the future operations, that it be wound upon a similar roller, M, which can be readily removed from the apparatus.

The roller, M, is for this purpose enclosed in a movable box, N; it is hollow and suspended from an axis, Q, of smaller diameter, around which it can oscillate; this axis is driven by the main shaft, A, by means of a friction roller, U^1, acting against a disc, U.

The friction of the axis, U, in the interior of the roller, M, is sufficient to wind up the riband when it is supplied to it by the motion of the points of the apparatus, but not when it is at rest.

By giving to the tube, M, a larger diameter than that of the axis, and by causing the riband to pass thereto from above, the live force stored by the roller during its motion can only produce, at the moment of stoppage, an oscillation on the axis, the roller attaining a position about that indicated in dotted lines, M^1, in fig. 3 without continuing the winding.

The riband, when wound, can be removed by means of the box, protected from the light.

When the apparatus is employed for obtaining positive pictures, the riband intended to receive these pictures is mounted upon the roller, P, and after exposure it is wound upon the roller, M.

The negative riband, R^1, is mounted upon a second roller, P^1, above the roller, P; it is superposed on the riband, R, in traversing the apparatus, and

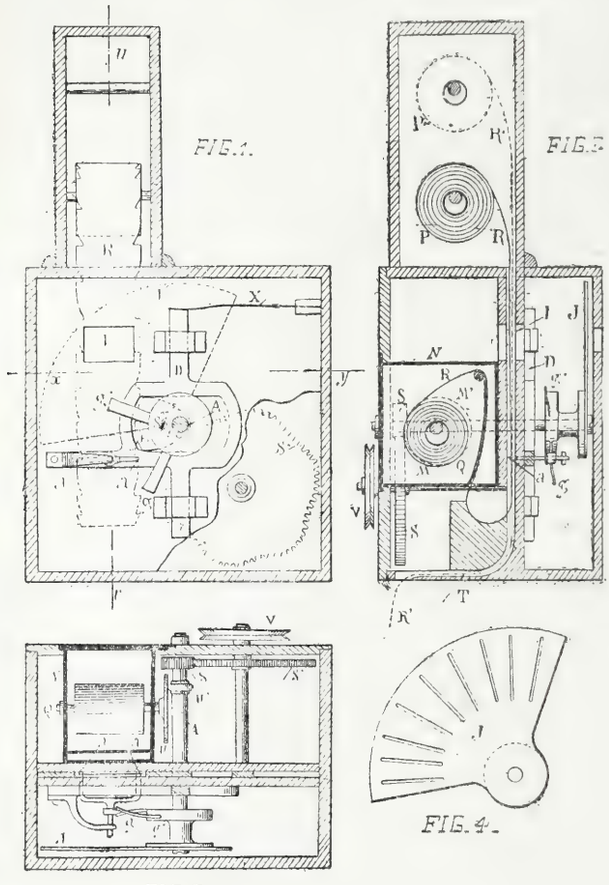


FIG. 4.

is drawn forward at the same time with it by the fork, but it then separates from it and leaves by a passage, T.

To diminish the scintillation due to the periodic passage from light to darkness during the viewing of the pictures, the segmental screen, J, is provided with radial slits, of suitable forms and dimensions, which can be more or less near each other, and as shown at fig. 4.

The claims are:—

1. In apparatus of the character herein referred to, for obtaining and viewing chrono-photographic or zoetropic pictures, a mechanism for moving the riband which receives or exhibits the successive images or pictures, and consists in driving the main shaft by means of eccentric wheels which increase its speed during the movement of the riband.

2. In apparatus of the character herein referred to, for obtaining and viewing chrono-photographic or zoetropic pictures, a mechanism for winding up the said riband after having received or exhibited the images or pictures, and consisting of a roller suspended from an axis upon which it can oscillate, and moved forward by the friction of this axis, which receives its motion from the main shaft.

3. In apparatus of the character herein referred to, the substitution, for the perforated riband heretofore employed, of notched riband, facilitating the action of the fork thereon.

4. In apparatus of the character herein referred to, the addition of a radially slit segmental screen for diminishing scintillation.

THE CAUSE OF THE FORMATION OF THE LATENT IMAGE ON GELATINO-BROMIDE PLATES.

I.

THERE is hardly any other practical application of scientific discovery which has developed so entirely empirically as photography. Most of the notable improvements were the results of accidental observations, worked out empirically. The nature of the chemical processes occurring in photographic operations, the reactions going on during development, toning, &c., are little known, they were never completely investigated, quantitatively or qualitatively, and the scientific solution of the chemical problems involved has been barely attempted. Meanwhile it is these problems which present the greatest interest and the richest field of discovery for the future investigator. It can be said without exaggeration that photographic chemistry has not yet begun, as the fragmentary knowledge we possess can hardly claim the name of science, uniting a large number of facts into one harmonious whole.

As the principal question we take the action of light on the sensitive plate. The cause of the formation of the latent image remains still a mystery, notwithstanding many attempts to explain it. Some of the investigators who have studied the question have come to the conclusion that the action of light on the sensitive plate produces some peculiar chemical process, described rather vaguely as a kind of migration of atoms of bromine from one molecule to another.* Other experimenters suppose that, under the action of light on gelatino-bromide plates, the bromine is liberated, with formation of lower compounds of bromine and silver, compounds which are never isolated in a pure state, and never obtained by other means. Meanwhile bromide of silver is known to belong to the most stable compounds, and during the short time necessary to produce the latent image there is no decomposition. In the chloride as well as in bromide of silver decomposition occurs only after prolonged exposure, with liberation of chlorine or bromine.† As regards the iodide of silver, which is known to give also a latent image, the liberation of iodine was never observed even after a prolonged exposure. It would seem, therefore, that the explanation of the latent image by a partial decomposition of the haloid salts of silver is not founded on facts. Neither is there reason to suppose that the action of light produces some isomeric (in the chemical sense of the word) modification of silver bromide; the isomeric changes, as far as it is known, occur only in more complex molecules, and there is no reason to apply to a single case a hypothesis inapplicable to all other analogous compounds.

Some men of science admit as the cause of the latent image a special state of silver bromide, produced by the action of light and the absorption of light energy. According to this theory, the energy of light is absorbed by the bromide, the molecular motion is increased, and the molecule comes into a kind of loosened state, a state of incipient decomposition.‡ In other words, according to this view, the silver bromide submitted to the action of light is in the incubation period of its decomposition, and remains in this state until the developer, chemically reacting with bromine, is applied, and metallic silver reduced. This explanation of the formation of the latent image cannot support a critical examination, as it is categorically refuted by existing scientific data. Not to mention that the time of exposure necessary to obtain the photographic image on modern rapid plates is too short to produce the combination or decomposition of the most easily reacting bodies, the principal objection to the foregoing view is found in the fact that, the potential state induced by the action of a physical agent and preceding the reaction rapidly disappears on withdrawal of the agent before the beginning of the reaction, and the bodies return to the original state. Meanwhile it is known that a gelatino-bromide plate, exposed in a camera and having a latent image, can be developed years after exposure.

Analysing the chemical side of the phenomena, we are forcibly led to the conclusion that the process of formation of the latent image is essentially different from all known chemical processes, and that the cause of the formation of the latent image does not lie in the chemical changes of the matter. Equally unsatisfactory are other existing hypotheses, explaining the cause of the formation of the latent image.

It seems to me that this formation can be explained on the ground of existing scientific data without having recourse to new hypotheses.

It is known that light and some other forces have the characteristic property of producing changes in the molecular state of many bodies. From many facts relating to the subject, I shall only mention here the well-known researches of Schrötter on the change of white phosphorus into the red variety under the influence of light, and the investigations of Lallemand§ on the crystallisation from the solution in carbon bisulphide of a little soluble form of sulphur.

Taking into consideration these and some other analogous facts, we can admit most easily that the action of light on gelatino-bromide plates consists in the transformation of the amorphous into the crystalline bromide of silver.

In fact, silver bromide, precipitated in the dark and carefully washed, is not changed by the usual developers, while the same bromide, fused in the dark, crystallises on cooling and is easily reduced. There is no need to fuse the salt, the transformation taking place at a much lower temperature. Immersed in boiling water, in the dark, the silver bromide is easily reduced by developers, without exposure to light, evidently in consequence of its passing into the crystalline state at the temperature of boiling water.

Desiring to prove the fact of the crystallisation of silver bromide under the influence of light, I examined the action of light on the solution of amorphous silver bromide, precipitated in the dark, at a low temperature, and with all necessary precautions. I hoped to obtain by

* Liesegang, *Photographic Chemistry*.
† H. Vogel, *Handbuch der Photographie*, I. Th. 133, 168.
‡ De la Baume Pluvinel, *Théorie des Procédés photographiques*, p. 34.
§ *Comptes Rendus*, lxx., p. 182 (1870).

hese means the separation from the solution of the less soluble crystalline bromide, as in the experiments of Lallemand. The arrangement of he experiment was similar to that of Lallemand's. The solution was laced in a glass vessel with flat, parallel sides, and a beam of light was hrown on it by means of a lens.

As is known, bromide of silver belongs to the category of difficultly oluble bodies, and there are only very few liquids which can be used for ts solution. The greater part of these solvents react on silver bromide y double decomposition, or by forming with it new molecular combinaions. To the first type belong ammonia and hyposulphite of soda; to he second, thiosinamine and thiourea. Of all the bodies which could issolve silver bromide without reacting with it, the most convenient appeared to be the salts of mercuric oxide and hydrobromic acid. According o the investigations of M. H. Debray,* the solution of mercuric nitrate asily dissolves bromide of silver. Debray supposed also that other nercuric salts have the same property. In my own experiments I have ound that silver bromide dissolves pretty easily in an aqueous solution f mercuric bromide ($AgBr_2$) in mercuric nitrate and mercuric acetate; ut from these solutions I did not succeed in separating the crystals of ilver bromide, as the mercuric bromide and acetate are decomposed by ight. Silver bromide dissolves also easily in the fifty per cent. solution f hydrobromic acid, most of the salt separating on dilution with water. This solution, prepared in the dark, was placed in the parallel-sided essel, and a pencil of sunlight was directed on it by a lens. The transparent solution soon became cloudy in the path of the rays, the rest of he solution remaining transparent; but, even with long exposures, I ould not obtain the separation of the crystals; the solution, after tanding for some time, became transparent again. Probably the crystals re not separated, because the solubilities of the amorphous and crystalline bromide in hydrobromic acid are nearly equal.

Prof. G. Lagermarc.

THE MANAGEABILITY AND SAFETY OF ACETYLENE.

These questions, writes E. R. P., in the *English Mechanic*, are quite listinct from the estimate of the quality and intensity of the light given out by an acetylene burner, and do not admit of such satisfactory answers.

(1) In the first place, in spite of the common statements to the contrary, the evolution of the gas does not entirely cease when the supply f water to the calcium carbide is stopped, for the simple reason that he carbide during the action becomes covered with or buried in a noist, pasty mass of calcium hydrate, which retains enough water to ontinue the action for an indefinite time, though slowly. The result is hat, if the supply of acetylene to the burners is stopped, the gas collects n the holder, and, when the latter is full, the excess escapes under the ower edge through the water, and fills the room with its nauseous smell. This might be avoided by fitting the gas-holder with an automatically cting escape valve, like that used on the reservoir of an organ bellows, which would open when the holder is nearly full, and allow any excess f gas to pass away into an indiarubber bag or similar receptacle.

(2) Also, it should be noted that acetylene is about as soluble in water as carbon dioxide; and in most, if not all, of the generators itherto brought out it remains in contact with a large volume of water. Thus, not only is there a considerable loss of gas, but also it diffuses hrough the water into the air of the room, causing the usual unpleasant mell. I have consulted several good authorities without obtaining any lefinite information whether acetylene has any solvent action on indiaubber. If it has little or none, I do not see why rubber bags should not e used to contain the gas instead of the rather cumbrous and splashy vater-holders.

(3) In the next place, with regard to the safety of acetylene, I do not hink that the fact is yet sufficiently recognised that a mixture of cetylene with air explodes far more violently than any mixture of coal as with air. Theoretically, one volume of acetylene requires two and a alf volumes of oxygen for complete combustion; hence one volume of cetylene gives the maximum force of explosion when mixed with about welve and a half volumes of common air. (The same amount of air, it nay be noticed, requires the addition of nearly twice as much coal gas efore a dangerously explosive mixture is formed.) Any one may prove his fact for himself by testing successive samples of the gases which ssue from the outlet of any form of acetylene generator when first put nto action. These samples may be collected over a pneumatic trough, r which a common basin or tub will answer. A jar of thick glass, bout 6 in. by 1 in., or a soda-water bottle, should be used; but a sharp xplosion is obtained even from the contents of a jar of half the size. t first so much air is present, that the mixture will not catch fire when lighted match is held to the mouth of the jar. The succeeding portions xplode sharply, with a blue flame. Then the amount of acetylene in he mixture becomes so great that it burns with a dull, smoky flame, assing slowly down the jar, and leaving a sooty deposit on the sides. When this is the case, and not before, it will be safe to light the gas at he lantern burner. I have always used a small brass bottle, about 3 in. y 1 in., made out of an old cartridge case, filling it with the mixture by simply introducing the end of the indiarubber connecting-tube and opening the tap for about a second, then shutting off the gas, closing the mouth of the bottle with the thumb, and removing it a yard or two away from the generator before firing the gas.

I consider that makers of generators, &c., are much to blame for giving in their printed directions no warning to their customers about the explosibility of a mixture of acetylene with air. The usual directions are simply to apply a light to the burner as soon as the tap is opened. If anything should take the presure off the gas-holder, or reverse its direction, the mixture would be likely to "fire back," and an awkward accident would be the result. One maker has given me the amusing assurance that, "to cause an explosion, a light would have to be applied to a volume of the mixture, amounting to, say, a room full."

Every one who has had experience in the eudiometric analysis of gases knows that a mixture of acetylene with oxygen in the theoretical proportions explodes about as violently as any mixture he has to do with. No ordinary eudiometer will stand the shock, and special means have to be taken to lessen its force by diluting the gas and expanding it before passing the spark. In their experiments on the products of combustion of acetylene (*Journal of the Chemical Society*, January, 1897, p. 26), Messrs. Bone and Cain had to use a thick leaden pipe, of small diameter, and even this sometimes failed to hold together.

4. But, further, there is an element of instability in the constitution of acetylene itself. Every schoolboy who is learning chemistry knows that acetylene belongs to the class of "unsaturated" compounds (though it should be noted that van 't Hoff draws the line short of it), whose molecules have their mutual affinities not fully satisfied, and are therefore by no means disposed to "dwell together in unity." The carbon atoms in the acetylene molecule are not united with as many hydrogen atoms as they want, and their residual affinities seem to expend themselves in association with their brothers; a course liable, as usual, to result in "family jars." Hence acetylene can be rather easily separated or "dissociated" into its elements, carbon and hydrogen, either by a high temperature or by a mechanical shock, much in the same way as nitroglycerine. A lecturer on chemistry of considerable experience told me a few days ago that, when a tight is applied to a large, tall jar of acetylene, the combustion proceeds quiety down the jar to a certain point, when the temperature becomes sufficiently high to dissociate the rest of the gas with a violent explosion, shattering the lower part of the jar to pieces. I must say that I have not yet succeeded in realising this result with small jars, or with jars seven inches by three inches. (I have no taller jars at hand, but I shall try the experiment again when I can get some.) This tendency to dissociation has, no doubt, been the cause of those terrible accidents with the liquefied gas (and probably of others also) which have done more than anything else to shake our confidence in the safety of the substance.

5. Once more, acetylene has the following very exceptional property: In nearly all cases, when substances combine to form a chemical compound, a large amount of energy is set free in the form of heat; but the formation of acetylene and a few other highly inflammable and explosive compounds, such as carbon disulphide and chlorine oxides, a very large amount of energy is taken in during the process, one gramme of acetylene absorbing an amount of energy equivalent to 48,170 calories of heat. Such substances are known as "endothermic" bodies. This statical energy appears in the form of heat when the compound is broken up, and this evolution of heat, which is added to the heat produced in the combination of the elements of acetylene with oxygen (about 262,000 calories for each gramme) fully accounts for the exceptional violence of the explosion of mixtures of acetylene with oxygen or air.

6. On the whole, so far "as at present advised," while I think that acetylene as an uncompressed gas (with the compressed or liquefied substance I would have absolutely nothing to do) is fairly safe in the hands of experienced and intelligent persons, I cannot yet consider it entitled to a place as an entirely trustworthy and danger-free illuminant; but I fear that many heads will be knocked to pieces (like that of the plumber at Egremont last week) before a conviction of the necessity of using exceptional caution in dealing with this exceptional gas is hammered into them.

* *Comptes Rendus*, lxx., p. 995.

DANIELL'S IMPROVED METHOD OF EXHIBITING PHOTOGRAPHS.

This method is thus described by the inventor:—"I take a photograph produced by the ordinary method on thin paper or similar material, and cut out roughly the figure photographed, from the surrounding surface or paper. I then provide a thin sheet or plate of zinc or other suitable metal or material, and paste or otherwise secure the roughly cut-out figure to one side or surface thereof, after which I cut the plate to the actual outline of the said figure, which is thus provided with a solid mount, giving it a realistic effect.

"I also combine with the said figure or photograph suitable or applicable surroundings; for instance, if the photograph is that of a child, it may be shown in a swing, with a framework of metal or other suitable material, or, if that of a cricketer, the background may be represented by a tent, and wickets or suchlike. Photographs of dogs, horses, or other

animals, may also have for a background a frame representing trees, shrubs, or jungle.

"The figures are mounted on suitable pedestals, or sunk into mounts, the pedestal or mount being provided with velvet when preferred.

"It is evident my invention is capable of a great variety of applications, its object being to give to photographs an artistic and realistic effect.

"In order that the invention may be more clearly understood, reference is had to the accompanying drawings, in which fig. 1 shows a group of figures formed according to my invention from photographs mounted

Fig. 1.



Fig. 3.

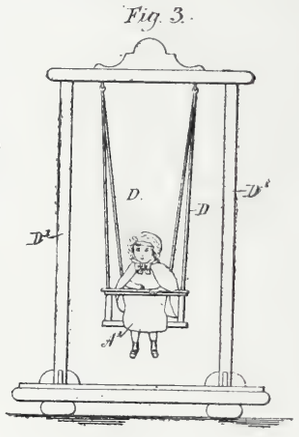
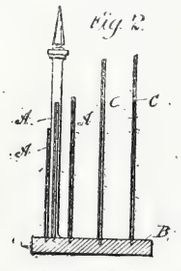


Fig. 2.



on metal; fig 2 is a side view of the same, and fig. 3 shows a figure mounted in a small toy swing.

"Referring to figs. 1 and 2, the figures, A, prepared from ordinary photographs cut out and mounted on metal strips of corresponding form, are fixed on the base, B, in proper relative positions, so as to form an attractive group, the back piece, C, consisting of a scene forming a background to the group of figures.

"These plates may be fixed to small separate blocks which are afterwards secured on the base, or the latter may be provided with grooves or slits to receive the figures, this being the simplest method. Instead of fitting the figures in groups on a base, a small base or pedestal of any ornamental description may be used, carrying a single figure, which is fixed in a groove, or glued or otherwise cemented to a support.

"As shown in fig. 3, the figure, A^1, of a child is shown in a swing, D, which is cut from the photograph and carried by the frame, D^1, of metal or other suitable material."

PRINTING AND TONING AT ONE OPERATION: SCHOENFELDER AND KEHLE'S METHOD OF PREPARING THE PAPER.

"Our composition," says Messrs. Schoenfelder and Kehle, "consists of the following ingredients combined in the proportions stated, and which we will call 'stock' or 'ground' solution, viz.:—

Stock Solution A.

Collodion	
Pyroxyline	three hundred grains.
Ether	one pound.
Absolute alcohol	,,

Stock Solution B.

"Fifteen grains of a chloride of a metal of the platinum class, such as gold, iridium, rhodium, osmium, palladium, or platinum chloride, said fifteen grains of chloride being dissolved in one and one-half ounces of alcohol (forty per cent.).

"One and one-half ounces of Stock Solution A is thoroughly mixed with ten drops of Stock Solution B, and the following ingredients are added in the proportions stated, viz.:—

"(*a*) Three grains of an organic acid, such as citric, tartaric, or formic acid, &c., which is dissolved before mixing with the other ingredients in three drops of alcohol;

"(*b*) Fifteen grains of silver nitrate or its equivalent, first dissolved in fifty drops of forty per cent. alcohol;

"(*c*) One and one-half grains of a chloride—such as strontium, barium, or zirconium chloride—dissolved before mixing with the other ingredients in three drops of forty per cent. alcohol;

"(*d*) Two drops of a softening chemical, such as glycerine or castor oil.

"(*e*) Five to fifty drops of ammonia (according to its strength) and

"(*f*) Two to five drops of gold bromide.

"The above emulsion is applied to the surface of the material on which the picture or photograph is to be printed.

"The surface must be thoroughly dried before using.

"After the print has been made it is given a bath in a solution of sodium hyposulphite, one part to fifteen parts of water, in which bath it remains until all superfluous chemicals have been removed from the picture (about five minutes), when it is taken out and thoroughly washed in clean water. The picture is then ready for mounting, and does not require any additional toning (as the toning has been accomplished simultaneously with the printing), and it has a superior finish of a slight bluish tone that will not fade or turn yellow by being exposed to light. By adding ammonia to the emulsion the time of exposure is greatly reduced, and, by the gold bromide, the tone of the picture is given a slight bluish appearance.

"In place of Stock Solution A, a solution can be used composed of gelatine, one part and water three parts, in which case the ingredients mentioned under *a*, *b*, and *c* are dissolved in water instead of alcohol."

PHOTOGRAPHIC EXPORTS.

Compiled from the Customs' Entries.

March 1897.

Adelaide	£136	Brought forward	£2659	Brought forward	£4234
Amsterdam	11	East London	11	Melbourne	834
Auckland	248	Flushing	246	Otago	44
Bangkok	39	Fremantle	201	Penang	40
Bombay	608	Ghent	130	Philadelphia	10
Boulogne	63	Gibraltar	9	Port Elizabeth	190
Brisbane	357	Hamburg	269	Rangoon	158
Buenos Ayres	20	Hong Kong	185	Shanghai	196
Calcutta	175	Hiogo	54	Singapore	87
Capetown	152	Jamaica	10	Sydney	536
Christchurch	65	Kurrachee	70	Tokio	50
Colombo	172	Lyttleton	47	Trinidad	10
Constantinople	14	Madeira	20	Wellington	33
Demerara	30	Madras	227	Yokohama	597
Durban	569	Marseilles	96	Zanzibar	50
Carried forward	2659	Carried forward	4234	Total	7068

March, 1896.

Adelaide	£203	Brought forward	£3840
Alexandria	16	Lyttleton	71
Algoa Bay	84	Madras	91
Amsterdam	23	Malta	42
Auckland	80	Melbourne	617
Bombay	1174	Oporto	27
Boulogne	62	Perth	32
Buenos Ayres	23	Port Natal	24
Calcutta	831	Rangoon	52
Calicut	12	Shanghai	220
Capetown	206	Singapore	133
Colombo	19	Suakim	11
Delagoa Bay	16	Townsville	2
East London	63	Wellington	66
Flushing	101	Yokohama	119
Genoa	83		
Ghent	129	Total	5377
Hamburg	549		
Hong Kong	26		
Kurrachee	91		
Lisbon	49		
Carried forward	3840		

PROFESSOR HERKOMER'S "NEW" ART.

Professor Herkomer, on Saturday, April 3, gave an exposition of his "new" process for the autographic reproduction of drawings in black and white, before a crowded audience at the Royal Society of British Artists' Galleries, Suffolk-street, Pall Mall. The Professor explained at the outset that his lecture was a technical one, but it soon became apparent that it was also a technical audience, and at the close of the demonstration everybody, except perhaps a few laymen, seemed to be as well acquainted with the process as though they had themselves invented it. The leading feature of the "new" art is that it will enable the painter to present his best pictures to the public in black and white without departing from his method of work. All he has to do is to paint his picture on the silvered surface of a copper plate. He does this with black ink of the consistency of printers' ink. He works with brushes, with his fingers, with a dabber, with stumps of wood—indeed, with anything, and with a pointed stick he can pick out white spots at will. With a wipe of the hand he can rub out anything which does not please him, and this he can do at will until he is satisfied with

his production. Having completed his picture, he has to pepper powdered copper over it, through a silk sieve, until the plate is entirely covered. Where the ink is thick the larger grains of powder adhere, and where it is thin only the fine dust remains. Then the plate has to be shaken and delicately brushed so as to remove all powder from where there is no ink. The dust-covered positive is now ready for the electrotyper, and in the bath a second plate is formed over the surface. Now the plates are separated, and the negative is ready for printing. A limited number of artists' proofs are taken from the plate, and then the surface may be steeled over, and thus rendered durable for any number of reproductions.

A COPYRIGHT CASE: MELVILLE *VERSUS* HUTTON AND OTHERS.

On Saturday, March 27, the above case was tried at the Liverpool Assizes, involving an important question of infringement of copyright. The action was brought by a Mr. Melville, a photographer, carrying on business at 98, Market-street, Manchester, against Mr. Hutton, a publisher at Manchester, in regard to an alleged infringement of copyright in a portrait, by the publication of it in his newspapers, the *Sunday Chronicle*, and the *Sporting Chronicle*. It appeared by the evidence that the plaintiff, who was in the habit of taking photographs of many athletes, took a portrait of a well-known athlete of the name of Bacon without making any charge, but, at the same time, stipulated that the copyright should belong to him.

A picture of Bacon afterwards appeared in the newspapers of the defendant.

This, the plaintiff contended, was a reproduction of the one taken by him. He proved that he occasionally supplied portraits for different periodicals, which advertised his name when they gave reproductions, and which became a great advantage to him in his business.

For the defence, it was contended that the plaintiff had no copyright in the portrait in question, as Bacon had paid for it, and also contended that the picture was not entirely taken from the plaintiff's photographs.

Mr. Melville was called and examined at considerable length to prove his case; a lady, named Mrs. Sarah Namly, the mother of the plaintiff and Mr. Melville, junr., the son, were also called as witnesses on behalf of the plaintiff.

Mr. Arthur Young an artist and photographer of many years' experience and also Mr. Brothers, who spoke from many years' experience, were then called to prove that the likenesses in the defendant's papers produced, were taken, in almost every particular, from the photograph taken by Mr. Melville.

Mr. McCall, before addressing his Lordship, preferred to call his witnesses. Mr. Frederick Ernest Bacon, the athlete, then gave his account of the transaction which differed from the plaintiffs in almost every particular.

Mr. Houlton having also been called as a witness closed the evidence for the defence. The learned Counsel for the plaintiff and the defendants having addressed the legal arguments to his Lordship on behalf of their respective clients, Mr. Justice Collins said he would deliver his judgment in London. Mr. Pickford, Q.C. and Mr. Wilkinson represented the plaintiff. Mr. McCall, Q.C., and Mr. Bradbury represented the defendants.

Our Editorial Table.

Rev. W. Sidgreaves, S.J., F.R.A.S., the editor, has sent us the volume containing the results of meteorological, magnetical, and solar observations taken at the Stonyhurst College Observatory during the year 1896. The volume is replete with scientific notes of great value. Many of our readers who cherish the memory of the late Father Perry will be interested in the editor's note that over 350 photographs of stellar spectra have been obtained with the compound prism spectrograph in combination with the Perry-Memorial objective. These include some trials with the small dispersion of a single half-prism of aluminium glass, in order to provide the means of learning the condition of the calcium line, K, in the spectra of small stars. The length of the spectrum is too small to show a fine line; but it distinguishes well between a broad, medium, and thin line, in stars to the sixth magnitude.

Dry Plates.

Published by Cadett & Neall, Ashtead, Surrey.

The April number of *Dry Plates* is the first of a new series, its publication, discontinued last year, being resumed at the request of many of Messrs. Cadett & Neall's correspondents. *Dry Plates* is edited by Mr. J. R. Courtney Gale, M.A., who contributes some gossipy notes on passing events; Mr. Cadett writes on the use of potassium ferridcyanide and hypo for removing green fog, and other articles complete the number of this useful little publication.

The Imperial Handbook for 1897.

The Imperial Dry Plate Company, Cricklewood, N.W.

This is a tastefully got up little book, containing matter of great interest and value. There are some admirable reproductions of instantaneous photographs, and articles on "Points on P.O.P.;" "The Making of Pictures;" "The Making Up and Use of Developers;" "How Long to Develop," by Alfred Watkins; and formulæ for developing Imperial plates. Wisdom and experience are manifest in the articles, which can be read with great profit. The *Imperial Handbook* will be found useful and informative by all classes of photographers.

Catalogues Received.

Evans, Sons, & Co., 56, Hanover-street, Liverpool.

In sending us a copy of their photographic catalogue, Messrs. Evans state that they confine their business to registered chemists and any contemplating taking up photographic materials, on hearing from whom a copy of the catalogue, with discounts, will be forwarded. They also give advice or technical information if required. The catalogue extends to about 160 pages, is fully illustrated, and particularises a large variety of apparatus, chemicals, and sundries for photographic and lantern work.

L. Gaumont & Co. Paris: 57, Rue St. Roch.

We turn over the 250 pages of Messrs. Gaumont's catalogue with more than ordinary interest, as we are thereby enabled to perceive the difference in style and fashion between the apparatus in favour among French photographers and that which finds recognition in English catalogues. Hand and stand cameras in great variety of form are given great prominence in the catalogue; lenses of old and new types; shutters; eight different kinds of "finders;" studio furniture and apparatus; dark-room requirements; magnesium lamps, and arc lamps are also among the multitudinous contents of the catalogue, which is supplemented with a great deal of practical information, and is a very creditable production. Recent novelties in apparatus are also dealt with periodically in Messrs. Gaumont's *Revue Trimestrielle*, a copy of which has also been sent us.

The Swallow Hand Camera.

Marion & Co., Soho-square.

The Swallow is a simple form of magazine hand camera, lacking complication of movement, and therefore likely to find favour with amateur photographers. It takes plates $3\frac{1}{4} \times 2\frac{1}{2}$ inches, in sheaths, which are changed by pressing down the upper lever shown in the

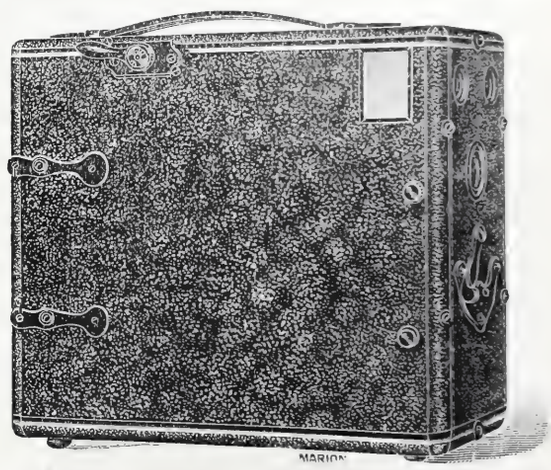


illustration. The movement is easy and certain. A "fixed-focus" lens, two finders, an exposure indicator, and a shutter, which may be set for time as well as instantaneous exposures, are provided with the instrument, which is sure of appreciation by those who require the utmost simplicity in a hand camera.

News and Notes.

Messrs. J. Bulbeck & Co., of 167, Strand, were last week invited to exhibit a large number of their architectural photographs at the Royal Institution, and were specially requested to allow them to remain on view for a week.

We are informed that in future Messrs. Bender & Co., of Croydon, will trade under the style of Bender & Langfier. The firm's new address is 242, London-road, Croydon.

Royal Photographic Society.—Royal Photographic Society's Ordinary Meeting, Tuesday, April 13, at eight p.m., at 12, Hanover-square, W. *Colour Measurement in Photography*, by C. F. Townsend.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, April 14, at eight o'clock. Members' Open Night, slides, &c., including a series of animal studies by Mr. Charles Reid, of Wishaw.

At a recent meeting of the Royal Botanic Society, the Rev. Professor Henslow read a paper upon the effects of light on the colouring of plants, a subject on which very little is known. He spoke of the work lately done by Mr. Sorby in this direction with the spectroscope, explaining the effects of the different light rays upon plant colours, and showed how all colours were really produced in the green tissue of the leaf. It appears that the learned Professor agrees with the theory that yellow is the primary colour.

Proposed New Observatory for London.—An important announcement was made at the last meeting of the British Astronomical Association. Mr. E. W. Maunder stated that a short time ago the Royal Botanical Society approached the Royal Astronomical Society, and made them an offer of a site for the erection of an observatory. As it did not seem within the purpose of the Society to entertain the proposal, it passed on to this Association. During the past week Mr. Petrie (the Secretary) and himself paid a visit to the gardens of the Botanical Society, and were shown the site which they proposed to place at the disposal of the Association at a peppercorn rent. The Council of the Association had decided to accept the offer. The question as to where they were to get the funds for the erection of the observatory would have to be considered, and he thought the Association might be looked to for these in due time. A committee had been formed to carry out the negotiations. It was stated that a new branch of the Association was about to be formed at Melbourne.

Liverpool Amateur Photographic Association Exhibition.—"The artistic development of the camera power has been very effectively carried out during recent years as a result of the energy, enterprise, and discriminating taste of the Liverpool Amateur Photographic Association," says the *Liverpool Mercury* of April 3, "with headquarters in Eberle-street, and the exhibition of members' work there, now open for public inspection, clearly indicates that, individually and collectively, the members have successfully endeavoured to raise photography to the position of a valuable assistant in the fine arts. The general work is distinguished in very large measure by the uniform excellence of the pictures, and the refinement, tone, and effective groupings of many of the exhibits display the capabilities of the members of an Association which deservedly holds a prominent position amongst similar institutions in the United Kingdom. There are in all 134 pictures of excellence on exhibition in the interesting collection, and the work as a whole shows manipulative power, artistic discrimination as to pose and picture, and considerable refinement in the actual production of the various subjects. Dr. J. W. Ellis, F.E.S., President of the Association, fully justifies his honourable position by the production of graphic illustrations of a *Sunset at Hoylake*, *A Gleam of Sunlight*, *Eastham Woods*, and other landscape subjects, each of which is produced with a refinement born of artistic instinct. Mr. E. R. Dibdin, one of the Vice-Presidents, has succeeded in a remarkable way in giving lifelike portraiture and striking characterisation to Mr. John Finnie, late Head Master of the Government School of Art in this city, a portrait which will be greatly prized by those who had the advantage of the master's tuition. Mr. Paul Lange, who has travelled far and found ample work for his camera, is represented by winter pictures of a character for which he is famous. The *genre* pictures of Mr. F. K. Glazebrook deserve special mention, as they display discretion in posing, wisdom in selection, and capability in production. Dr. Llewellyn Morgan also greatly distinguishes himself in his exhibits, his 'fuzzigraph' production of *An April Shower* forming one of the most attractive studies in the interesting Exhibition. Mr. J. Appleby's exhibits must also command attention and inspection by reason of their graphic power; and Mr. T. F. Lloyd, in a series of Meissonier-like pictures, shows what can be done artistically in the way of photography. Mr. J. Appleby's subject, *The Dreamer*, has already had honours conferred upon it, and its presence on this occasion gives enhanced value to the interesting Exhibition. *The Liver Sketching Club Life Class*, by Mr. E. R. Dibdin, is an interesting study under difficulties; and Mr. John Bushby will secure general approval in connexion with his graphic and artistically executed illustrations of Bosnian every-day life. Mr. E. Sinnett's *Tranquil Eventide* must attract admiration; Mr. W. Tomkinson, always enthusiastic, is represented in a creditable way by various exhibits; and amongst the other notable exhibitors are Messrs. F. A. Schierwater (Hon. Secretary), J. A. Forrest, A. Grillon, J. H. Welch, J. S Brown, and G. Allday. The Exhibition will be open free to the public during the present month."

Edinburgh Photographic Society's Exhibition.—The Annual Exhibition of the Society was opened on April 3, and will remain open during the whole month. The number of pictures shown this year reaches nearly 300, being an increase of nearly sixty on the exhibits of last year. With this increase in numbers, there is also an improvement in quality, and the employment, in most cases, of platinotype and carbon in printing shows the members to be quite up to date. The carbon process is very largely represented indeed, and the Society is to be congratulated on having among its members so many workers capable of manipulating this most beautiful printing method. The Open Class is a particularly good one, and it is worthy of notice that most of the pictures here are low in tone and framed close up. On the evening of each Saturday during the month there will be an entertainment of some sort. Mr. A. Eddington has kindly promised to give a lecture on *The Tweed from its Source to the Sea*, and Mr. P. M. Macintyre, advocate, will lecture on *The Abbeys and Cathedrals of Scotland*. The Exhibition awards will be presented at a *conversazione* which the lady members are arranging, and Dr. Scott Lauder has kindly agreed to arrange for a musical evening. Messrs. J. Craig Annan, W. M. Warneuke, and G. W. Johnstone, R.S.A., kindly acted as Judges, and made the following awards:—Class I. (open to members and non-members), gold medal, No. 53, R. Ayton. A Division (landscape and seascape; silver and bronze medals offered), silver medal, No. 25, James Patrick, jun.; bronze medal, No. 18, Douglas Croall. B Division (figure studies and portraiture; silver and bronze medals offered), silver medal, No. 48, John Patrick; bronze medal, No. 45, F. P. Moffat; bronze medal, No. 43, Charles M. Wane. Open to members only: Silver and bronze medals offered for competition in each class; pictures must be the work of the exhibitor only.—Class II. (best picture, half-plate size and under, other than figure or *genre* composition), silver medal, No. 131, Alex. Allan; bronze medal, No. 138, J. Burns. Class III. (best figure or *genre* composition), silver medal, No. 235, R. S. Webster; bronze medal, No. 232, James Patrick. Class IV. (best picture above half plate size, other than figure or *genre* composition), silver medal, No. 182, J. Burns; bronze medal, No. 172, T. W. Drinkwater; bronze medal, No 175, J. Warrack, jun. Class V. (best set of four or five pictures, being work done with camera held in hand), silver medal, No. 258, Alex. M'Nab; bronze medal, No. 254, J. B. Johnstone. Class VI. (best picture, being the work of a lady member), silver medal, No. 162, Miss C. H. Curle; bronze medal, No. 156, Miss Daisy Duncan. Class VII. (best enlargement; a print from the original negative must accompany the enlargement), silver medal, No. 85, R. S. Webster; bronze medal, No. 101, Wm. Penman. Class VIII. (best set of six lantern slides), silver medal, No. 14, Charles A. Stitt; bronze medal, No. 11, John Stewart Smith. Class IX. (best set of three pictures taken at the 1896 Saturday Rambles), silver medal, No. 118, Alex. Allan; bronze medal, No. 117, J. C. Whyte. Open to amateur members only; silver and bronze medals.—Class X. (for the best direct picture), silver medal, No. 222, Alex. Allan; bronze medal, No. 205, Ralph S. Common.

London Stereoscopic and Photographic Company, Limited.—The Twelfth Ordinary Annual Meeting of the shareholders of this Company was held at 106 and 108, Regent-street, W. (Mr. Robert William Kennard presiding), on the 30th ult. The Chairman, in proposing that the report of the Directors and the accounts be approved and adopted, and a dividend of four per cent. less income-tax be declared, stated that the working of the Company had been very satisfactory during the past year, especially in regard to the new departure the Board made in taking up the bicycle trade. When that bicycle business was first started a good many connected with the Company doubted the wisdom of it, considering it was not in the Company's line. However, the results had well justified it. Having got hold of the best machine in the trade, viz., the Elswick, they had been able to do a very substantial business, so much so that they had found it necessary to take extra premises adjoining those they were now in for their stocks that were previously on the second floor, and they were now in course of preparing the very best showrooms in the whole of London. These would be open by Easter, and he hoped some of the shareholders would visit them, for he was sure they would be well satisfied with what they saw. He could only hope that the bicycle trade would continue to flourish as it had done in the last year. The ordinary business of the Company was going on as satisfactorily as they could expect. There was a small falling off in the sale of apparatus, but the commercial printing department was going on well, and, as they were full of orders, he thought they might look forward to having a good year. Mr. William Clarke seconded the motion, which was carried unanimously. The Chairman then proposed the re-election of the retiring Director, Mr. Albert Slee Hicks. Mr. G. Bruce Johnston seconded the motion, and said he was very glad to hear from the Chairman that the Company had done so well with the bicycle trade. It showed the advantage of taking up a good article. He was not in the cycle trade himself, but had long been a rider, and knew most of the machines, and, when he knew they had taken up the Elswick, he thought they had got a good thing, which would turn out a success. The motion was carried unanimously. Mr. Hicks, in thanking the shareholders for his re-election, said the business was one in which he took the greatest interest, not only in regard to cycling, although he also was a cyclist, but more in connexion with the amateur photographic department, in which he took very great interest indeed. Mr. S. P. Freeman proposed the re-election of Messrs. W. B. Peat & Co. as the Company's Auditors, which was seconded by Mr. Thomas Mitchell, and carried. Mr. G. W. Cuthbertson moved a vote of thanks to the Directors for their efforts in promoting the success of the Company. He referred to the many difficulties that surrounded the conduct of a business of this kind. So many technicalities and so much science were being introduced into the matter of photography just now that the very closest attention of the Directors was necessary, and they could only be grateful to the Board of this Company that they had given its affairs all the attention that they needed. There was one paragraph in the report to which he wished to draw attention. For many years he had been at these annual meetings, and it was with much sorrow, in which he was sure they would all join, that he missed the familiar form of their late Chairman, Mr. Howard John Kennard. (Hear, hear.) It was gratifying, however, that his son, Mr. R. W. Kennard, now occupied the position, and he had much pleasure in moving a vote of thanks to that gentleman and his colleagues. Mr. William Stanbury seconded the motion, which was carried unanimously. Mr. William Clarke acknowledged the vote, and said he fully sympathised with the remarks of Mr. Cuthbertson in reference to their late most excellent Chairman. Only those who, like himself, had worked with him could appreciate what an admirable man of business he was. His urbanity of disposition and ripe experience in business of all kinds rendered him an ideal Chairman; but, much as he might say about him, he thought it would be hardly becoming, in his son's presence, to say more, but he was sure that that gentleman would very much appreciate what had been said, and he thought they might look forward to the son very properly filling his father's place. With regard to the business, he rather found fault with the Chairman for having put the bicycles first. "Bikes" were all very well, and they were doing an excellent business in them, but they were a Photographic Company, and it was to that he looked forward to the permanent success of the Company. They must keep pace with the times, and, were it the "bike" or something else, it was quite proper they should go in for it if they could see their way to making a good profit; but the *raison-d'être* of the Company was its

photographic business, and he was glad to say that, in his opinion, that business was in a sounder condition than he had ever known it, and there was every indication that in this glorious Jubilee year they would do a prosperous trade. (Applause.) The proceedings then terminated.

Patent News.

The following applications for Patents were made between March 24 and March 31, 1897 :—

Hand Cameras.—No. 7345. "Improvements in and appertaining to Hand or Magazine Cameras or the like." F. W. Hudlass.

Dark Slides.—No. 7350. "Improvements in Photographic Dark Slides." H. W. V. Wilson.

Luggage-carrier. — No. 7501. "An Improved Luggage-carrier, especially intended for use by Photographers." J. W. Smalls.

Slide-carrier. — No. 7629. "An Improved Form of Optical or Magic-lantern Slide-carrier." H. L. Kerdel.

Screen Kinetoscopy.—No. 7635. "Improvements in Apparatus for Making and Exhibiting Kinetoscopic Pictures." J. H. H. Duncan and T. Reich.

Changing Box.—No. 7684. "An improved Method for Withdrawing Sensitive Photographic Films from their position in a Camera, more particularly after Exposure." G. C. Whitfield.

Print-holder. — No 7826. "A New or Improved Appliance for Holding Photographic Prints whilst they are being Trimmed." A. E. Hancock.

Positives.—No. 7867. "Improved Flexible Photographic Positives." Complete specification. G. Schnitzler.

Shutters. — No. 7880. "Improvements in Shutters for Photographic Cameras." Communicated by R. Kroedel. The Eastman Photographic Materials Company, Limited.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
12	Bournemouth	Prize Slides.
12	Camera Club	*Some Recent Investigations in X-ray Work.* Campbell Swinton.
12	Richmond	*Mounts and Frames.* P. Ennis.
12	Stafford Y.M.C.A.	*Experiments in Photographic Optics.* H. Cliff.
13	Hackney	*Hand-camera Work.* W. Thomas.
13	Newcastle-on-Tyne	*Treatment of Figures.* Rev. F. C. Lambert.
13	Royal Photographic Society	*Colour Measurement in Photography.* C. F. Townsend.
14	Croydon Camera Club	(1) *The Ferrous-oxalate Intensifier,* (2) *Judging Development by Time instead of by Inspection.* F. P. Wratten, A.R.C.S.
14	Leeds Camera Club	Prize Slides.
14	Leigh	Competition: Album.
14	Leytonstone	*Stereoscopic Photography.* C. Amor.
14	Photographic Club	*A Series of Animal Studies.* Charles Reid.
15	Aston	Microscopical and General Exhibits.
15	Oldham	*Pictorial Photography.* J. Brooks.
15	West Surrey	Lantern Night. Paul Martin.
16	Croydon Camera Club	Excursion: Guildford. Leader, John Smith.
16	West London	*Our Outings.* J. Stein.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 1,—Mr. J. E. Hodd in the chair.

Mr. R. P. Drage, referring to the suggestion made at a recent meeting of the Association that plate-makers should consider the question of supplying plates backed ready for use, called attention to the fact that the Paget Prize Plate Company now offered to send out their XXXXX plates coated with orange collodion without extra charge.

The Chairman remarked that Messrs. B. J. Edwards, of Hackney, were prepared to back all plates free of charge, using caramel, which he considered was preferable to collodion.

The Hon. Secretary passed round some specimen pieces of the prints produced by Friese-Greene's method of continuous photographic printing. They included some printed upon both sides of the paper, and some with letterpress and illustrations combined.

Mr. Otto Schölzig's representative gave a practical demonstration of the use of the

Novitas Stripping-film Printing-out Paper,

designed for the production of lantern slides or transparencies, or for transfer to such materials as porcelain, ivory, and opal. If the print is to be transferred to any of these opaque materials, it should be printed only to the depth of an albumen print; but, in the case of transparencies and slides, it is necessary that the shadows be thoroughly bronzed, to ensure the proper vigour. The prints are toned in a sulphocyanide bath, fixed and washed, when they may be at once treated for transfer to the selected material. The operations of toning and fixing having been previously done, in this instance the dry prints were plaeed to soak in a vessel of cold water until limp, when they were removed, one by one, to a dish of hot water of about 120° F., which dissolves away the substratum and releases the film, which floats off. Whilst this is proceeding the glass, or whatever else may be chosen, is coated with a gum arabic solution of about seven per cent., and it is ready for the film, which, for convenience of handling, is temporarily received on a piece of special transfer paper. The film is brought into contact with the gummed surface and squeegeed, when the transfer paper is withdrawn and the film allowed to dry. In reply to the Chairman, it was stated that there was no distortion, owing to the hardness of the film.

The Chairman thought the process worth going into, and that for making enlarged negatives it would probably afford considerable facilities.

Several members engaged in a discussion regarding various lenses, and

Mr. Milner related how he had been enabled, with one of the newer lenses, to obtain a view at Canterbury which years ago he had been quite unable to attempt with the lenses then in use.

Mr. Rapson inquired the reason why, at one time, cameras with conical bellows were so much favoured by the press generally to square bellows, and a short discussion ensued upon this and other matters.

PHOTOGRAPHIC CLUB.

March 31,—Mr. E. A. Newell in the chair.

Mr. Bridge offered some words of welcome on behalf of his fellow-members to Mr. A. Cowan, who was present for the first time after his accident, a period of more than ten months.

Mr. Cowan expressed his pleasure at being once more amongst his fellow-members.

Mr. Welford, on behalf of the Lantern Committee, presented a new carrier for the Club lantern.

Subsequently the Committee were thanked for the gift.

Mr. H. Harvey George was elected a member of the Club.

Travellers' Night.

There was a full attendance of members and friends to see Mr. F. W. Hindley's series of slides of Italy. The lecturer deprecated any verdict being passed upon his work from the artistic or stand-camera man's point of view. He had only, he said, sufficient enthusiasm to work a hand camera. He advised all intending tourists to provide themselves with a passport, the expense was trifling and the convenience undoubted. He had rested entirely upon films for his work. He drew attention to the necessity for short exposures in the clear, bright air of the district he had visited. Starting from London, he illustrated with word and picture the route to the Riviera. Of that district and of Italy he showed a large series of fine slides. Amongst the best were some studies of Italian children and peasants, and an interesting set of Pompeii and Rome. The slides (about 150 in number) were excellent, both pictorially and technically, and were thoroughly appreciated.

The thanks of the Club were offered to Mr. Hindley by the Chairman.

Croydon Camera Club.—March 31.—The evening was devoted to the subject of

Enlargement,

a paper, illustrated by about a score of diagrams, prints, and negatives, prepared by Mr. J. A. Hodges, F.R.P.S., being read on his behalf by the President. An animated discussion was led off by Mr. James Packham, who made a number of suggestive and critical remarks of considerable practical value. Councillor Noaks, and Messrs. Smith, Maclean, Pusey, Costar, Rogers, and Gardiner were amongst others who followed. An approximate statement of the receipts and payments of the last lantern show indicates a balance of about 7*l.* to be handed over to the Croydon Hospital. Messrs. John Patrick and W. O. Sandell, jun., were announced elected members. A number of boxes of dry plates were distributed at the last meeting by Messrs. Thomas & Co., whilst on the 31st ult. Messrs. Wellington & Ward kindly forwarded a large number of packets of printing paper, including the well-known Sylvio and platino matt papers.

Dulwich Photographic Society.—March 30.—Mr. A. Hill, of the Cresco Filma Company, described the use of

Uranotype Paper.

Prints were shown which had been made for the purpose of the demonstration. The image appeared faintly visible, similar to those obtained upon platinotype paper. Mr. Hill then proceeded to develop the prints with a solution of ferricyanide of potash, and almost immediately the solution was applied the image appeared in a colour similar to Bartolozzi red. The prints were then fixed in a solution of citric acid and water; but, if desired, the colour can be altered by immersion (previous to fixing) in a solution of sulphate of iron and water. In this bath the prints go through various shades of red, brown, and green. The colour of the print may be stopped at any moment, so that almost any colour within certain limits can be obtained. A purple tone may be obtained by brushing over with a strong gold solution—gold, 4 grains; water, 1 ounce. Mr. Hill explained it was almost impossible to over-print, as it did not matter how long the picture had been exposed to light, or how dark it may have become on development, it could be brought back to its normal condition by immersion in a weak solution of ammonia and water. The drying may be done by heat, as there is no gelatine coating on the paper. Mr. Hill pointed out the advantage that accrued from the entire dispensing with hypo in the process, thus enabling a print to be developed, fixed, and dried in about ten minutes. He also described the use of his firm's Uranium Intensifier and Reducer.

Hackney Photographic Society.—March 30, Mr. W. L. Barker presiding.—The main business of the evening was the discussion of matters relating to the Club excursions and the monthly competitions which have been arranged in connexion therewith. The next official outing was announced for Saturday, April 10, to Loughton, leader Mr. W. A. Hensler; train leaves Liverpool-street at two p.m.

Richmond Camera Club.—March 29, Mr. Purcell presided.—Mr. W. J. Colebrook, of the Putney Photographic Society, gave a lecture upon

Instantaneous Photography,

illustrated by experiments and a large number of lantern slides. Amongst the

most remarkable of the latter were some photographs of falling jets of water as they broke into drops, taken by electric spark by the lecturer himself; and Professor Boys' photographs of a rifle bullet travelling at the rate of 2000 feet per second, in which not only the bullet but the air waves in its wake were clearly seen. The mode of conducting these experiments and the problems incidentally involved, such as calculating the duration of the electric spark, were lucidly explained by Mr. Colebrook, who was evidently master of his subject.

Bath Photographic Society.—March 24, Mr. George F. Powell (President) in the chair.—The CHAIRMAN gave his promised lecture on places visited by the Convention (Leeds meeting). Of Leeds itself he said little, preferring the picturesque to be found outside. Commencing with Kirkstall Abbey, he illustrated the best features obtainable, and dealt out but scant praise to the Town Council for their attempts at restoring the ruined abbey. Some views of Bolton Abbey followed, but the lecturer said he anticipated they would get an important lecture on this subject later on. The city of York was then dealt with, fully twenty views, showing glimpses more or less vivid, of the minster, besides others of, and from, the city walls, gates, public buildings, &c., were given, while the descriptive portion was most interesting. Another excursion chosen for illustration and narrative was Studley Royal, and here the lecturer had been able to take many charming photographs. Fountains Abbey followed, and was similarly treated, and lastly a view of Fountains Hall was given. The lecturer concluded by exhibiting some fine sunset photographs, and he explained to the audience the manner in which he secured them. The CHAIRMAN recommended photographers to support the Convention, and all who could do so should be present at this year's meeting at Great Yarmouth, commencing July 12, when Mr. F. P. Cembrano (who was elected Secretary at the Bath meeting) will assume the presidency. He (the Chairman) could promise any one that their personal expenses would be quite inadequate to defray the cost of the excursions and entertainments provided, but the committee at the various centres always arranged a reception fund which met the difference.

Bradford Camera Club.—April 1, Lantern Evening, Mr. J. Scarlett presiding.—Upwards of 200 members' slides were thrown on the screen by Messrs. C. W. Appleyard and A. Coe with the Society's lantern. The slides were very varied, including landscape, seascape, architectural, flower studies, and portraiture.

Carlisle and County Amateur Photographic Society.—March 31, Annual General Meeting.—Mr. WARWICK HELE presided, and said that it was very gratifying to know that new interest seemed to have arisen amongst them concerning things photographic. There had been nine meetings during the winter, the attendance had been above the average, and thirteen new names had been added to the list of members. The HON. TREASURER (Mr. Robson) submitted the balance-sheet, which, notwithstanding extra expenditure, showed that about 16*l.* stood to the credit of the Society. A long discussion ensued as to a still further development of the Society's usefulness to the members; many suggestions were thrown out for consideration by the executive. It was decided to establish a Society set of lantern slides, illustrative of the scenery and places of interest in Carlisle and Cumberland, the slides to be lent to such societies as could provide a set in return. The officers elected for 1897–98 are: *President:* Mr. Warwick Hele.—*Vice-Presidents:* Messrs. Rod, Maclaren, M.D., W. Wright, and J. A. Wheatley, J.P.—*Committee:* Mrs. Mounsey, Miss Currie, Messrs. J. Beaty, R. M. Hill, B. Eggleston, and E. G. H. Parker.—*Hon. Treasurer:* Mr. John Robson.—*Hon. Secretary:* Mr. Samuel W. B. Jack, 7, Petteril Bridge-terrace, Carlisle.

Leeds Camera Club.—March 31.—In a lecture on

LIGHT AND LENSES,

Mr. C. C. VEVERS, after describing in an interesting manner the principles and properties of light and its composition, the theory of colour in nature and the transference of light from its source by undulatory movement, explained the rudiments of photographic optics. He illustrated the first laws of optics by means of a pinhole camera. With this he showed that reflected light from an object in passing through a minute aperture reproduces upon a white surface the image of that object in an inverted position. He also proved that such an image is never clearly or "sharply" defined, although, the smaller the aperture through which the rays are admitted is, the sharper is the reproduction. It was also seen a pinhole possesses unlimited depth of focus, will include any angle of view, and will represent all objects, whether near or at a distance, equally in focus, and, were it not for its lack of absolute sharpness, and the prolonged exposure necessary through such a small aperture, we should have at once an ideal camera at a trifling cost. But the want of "crispness" is, at times, rather an advantage than otherwise, as is evinced by the many artistic landscapes that have from time to time been reproduced in the photographic journals taken through a pinhole aperture in place of the ordinary lens. Mr. Vevers next explained the object of lenses, clearly treating upon the principles of refraction, and the effect produced by lenses of different curvature. By means of blackboard diagrams, he showed the cause of chromatic aberration, or dispersion of the colours composing what is known as "white light." He showed that by using a simple lens a ray of white light is broken up into its elementary colours, and that the violet or chemical rays come to a focus at a point much nearer the lens than do the yellow and red or visible rays, hence the necessity of employing achromatised lenses in photography to unite once more the spectroscopic colours, and form white light at one focal point. This, he said, was done by combining lenses of different density and form, so that one corrects the chromatic dispersion produced by the other. Such a combination not only effects this end, but removes the focal point to a greater distance from the lens, thus forming a lens of longer focus than a simple or uncorrected lens. The term "equivalent focus," he said, was used to designate that point at which parallel rays of light meet, and is to be measured from the optical centre of the lens—near the back of the lens in single lenses, and between the two in doublets. The equivalent focus of a lens never varies, and is the basis upon which the "speed" of the lens is estimated in relation to its working aperture. Conjugate foci, he showed by a neat experiment, are the varying points of object and image, the one dependent upon the other, and this is the cause of the necessity of a focussing attachment to t camera when objects of varying distances are to be photographed. He th detailed the chief faults and characteristics of the single combination le amongst which are spherical aberration, which is remedied to a degree by t employment of a stop or diaphragm in front of the lens, the same additi also improving the definition or depth of focus of a lens, but at the sa time, by decreasing the aperture through which light passes, prolonging t exposure necessary. The distortion of perspective caused by lenses of sh focus was also dealt with, and "curvilinear distortion"—the principal fault a single lens—fully treated upon. The bulging out of a straight line can o be overcome by the employment of doublet lenses, consisting of two sy metrical combinations mounted in such a manner that the distortion in o direction produced by the one is exerted in an opposite direction, and th corrected by the other. Mr. Vevers also instructed his hearers in a simp method of ascertaining the angle of view included by a lens of known focu and finally, after describing and illustrating by means of chalk and bla board, the forms of rectilinear, wide-angle, and portrait lenses, and the ca and remedy for "flare spot," he explained at length the use and abuse stops, and gave many practical hints for the calculating of their values, a also for designing a series of stops of regular ratio, so that each stop sh require double the exposure required by the next size larger.

FORTHCOMING EXHIBITIONS.

1897.	
April 9–May 1	.....*Edinburgh Photographic Society. Hon. Secretary, J. McCulloch, W.S., 2, George-street, Edinburgh.
,, 19	..... Beverley Photographic and Sketching Society. H Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is take of communications unless the names and addresses of the writers are given.*

FRENCH CHALK.

To the EDITORS.

GENTLEMEN,—In my semi-jocular reply to S. S. C. I did not attem to enter into the *chemistry* of "French chalk," but merely to point o that he had been supplied with the wrong thing. In last week's JOURN however, I see that a correspondent (J. F. T.) steps forward to fill t blank; but, so far as I am concerned, I am afraid he only renders t composition of French chalk more ambiguous.

J. F. T. appears to be unaware, or passes over the fact that there a two quite distinct substances that pass under the name of "steatite" talc and soapstone—and I believe he is incorrect in saying that the lat is what should be sold under the name of "French chalk." At any ra I have always been under the impression—and may others, no doubt that that substance was powdered talc, called in France *craie de Briançon* from the fact that extensive beds of talc are found in the neighbourho of Briançon. Talc exists in two distinct forms, having the same chemi composition—a silicate of magnesia; one crystalline or lamellar, a much resembling *mica* in its character; the other more compact, heavi and possessing considerable hardness. I should be sorry for the amate who attempted J. F. T.'s recommendation to powder it for himse This, when powdered, is the substance used for anti-friction purpos and known as French chalk or *craie de Briançon*.

Soapstone—also called steatite—is a silicate of magnesia and alumi and is a soft substance, which becomes brittle on the application of he It is more unctuous in its character, and, though I have never tried i should judge it to be altogether inferior, in the powdered state, to talc photographic purposes.—I am, yours, &c., W. B. BOLTON

April 3, 1897.

PREVENTING HALATION—FIXATION.

To the EDITORS.

GENTLEMEN,—Your very interesting JOURNAL, always at hand, and re with great pleasure and benefit, suggests sometimes some questio Here is one of them, and as a consequence of your notice, made alre twice. To prevent halation, use a diaphragm *f*-200. Supposing you w to take a view of an interior, and with a certain diaphragm you sho expose, say, five minutes, will you obtain better results as regards sha ness and detail in shadows if you use a smaller diaphragm, and exp more accordingly, and, of course, sufficiently, or even obtain as g results as with the larger one? I suppose better results are obtained w a stop of larger size, and of sufficient size to give sufficient sharpness.

Now, to return to *f*-200. Generally one wants to prevent halation wh taking an interior against, or towards, a window, and in such a case window is not the only object in view, but also a corner which is more less dark, if not composed also of dark materials. Now, supposing t with a correctly backed plate an exposure with a sufficiently rapid a stopped down lens, a not uncommon exposure of fifteen minutes (wh sometimes is considerably increased) is needed, what exposure is nec sary for *f*-200? A whole day, I should think, would not always be

ong, and, if exposure is then found too short, then start on a longer xposure. Besides this objection of time, I am not quite positive that his *f*-200 would work in all cases, as I think that if with *f*-25 light will how a halo in, say, ten seconds, with an exposure of three or four hours, s may be needed, with *f*-200 the light will not have ample time to work he same halo (or havoc) as its shorter exposure with *f*-25.

However, I have not tried it personally. I heard of another use for -200, which I think would prove of more interest than for prevention of alation, and that is, to take street views minus carriages and walkers. t used to be well known that with former dry plates and their necessary ong exposure, passing carriages, &c., did not show. By using now *f*-200, nore or less, and a correspondingly long exposure, all traffic on the street ill be obliterated on the plate.

Another question I would like to have answered is, What is the differnce when fixing a negative in hypo if the strength of the hypo is three unces to the pound of water, or ten ounces of hypo to the same quantity f water? While this proportion may make a great difference when ixing prints, I cannot see any difference when fixing negatives. I came o this conclusion when, while fixing some negatives, I found they fixed oo slowly, and I added a few hypo crystals, which fell on the plate. fter a short time, I found that where the crystals had fallen the plate howed some transparent and fixed spots, which, when the plate was horoughly fixed, did not show, and I came to the conclusion that the nly difference between a three-ounce solution of hypo and a saturated one as in the time necessary for fixing. Am I mistaken?—I am, yours, &c.,

Asnières, Seine, April 4, 1897. A. Lévy.

WHAT IS ARTISTIC PHOTOGRAPHY?

To the Editors.

Gentlemen,—I am glad Mr. Shaw has had the courage to speak out. Every sane man cannot help feeling surprised at the booming of such specialism" as that alluded to last week. It seems to me, after a careful summing up, that a photographer is classed as an eminent person simply because he has had the luck to be acquainted with eminent men. Is it not so? I cannot really understand it. An eminent sitter surely does not make an eminent photographer? If it does, Marie A. Belloc has her work cut out, for there are thousands who deserve to be boomed—thousands who really do creditable and sensible work.

It is useless for an ordinary sane photographer to attempt to stop the tide of impressionists—accidental and otherwise—who are striving their level best to sneak in the back way of the Temple of Art, because he will not succeed. Give these fanatics plenty of rope and they will soon hang themselves. They will never gain admittance to the realms of art by legitimate means; far better try an asylum if they are bent on getting clear of us ordinary men; they would be safe enough there.

One man, who lives in the Elephant and Castle neighbourhood, has been bold enough to fill his window with "unphotographic photographs." I forget the special name he gives them, but they look to me like Solio, simply fixed and washed. For about a month I passed the shop daily, and I always lingered in front thereof for the purpose of hearing people's opinions, and not one person—no, not even one!—did I hear admire them. The novelty certainly attracted attention, but all turned away in disgust. What's the use of trying to push such things on to the public, for it surely means ruin in the end? The only way to succeed is to go on with the "usual thing" in spite of all the fuzzy-fuzzy cocks crowing.

The other day I sat in a free library opposite two working men, who were looking over the April *Woman at Home*. I didn't notice them until I heard one remark, "Carlyle must have been a tramp, then; look, Bill, at his phizzi-ogomy." I then began to be interested, and listened to their amusing criticism I won't bother you with it, except perhaps that Darwin. "Who's Darwin, Bill?" says one. "Oh, he had something to do with monkeys, I think," replied his friend. "Well, if he did," put in Bill, "he don't look much like an Italian, do he?" I watched them until they reached those charming reproductions at the end of the book, and then I heard, *sotto voce*, "Here, just have a look at these donahs, Bill; they're somethin' like. Ain't they spankin'?" This was too much for my intellect, so I went forth into the fresh air.

I spoke above of accidental impressionists; by that I mean people who get artistic (*sic*) results unintentionally. There are such people, you know, and it has been my good (or bad) fortune to meet some of them. Some workers openly avow that certain "effects" were accidentally obtained, while others claim that such are due entirely to their own efforts. I know in many cases, but only one will suffice. A short time ago I accompanied one of our foremost workers (that name is hardly right—but t'will serve). I admired "effects," and said that, if a suitable subject presented itself, I would take it "impressionistic like." The first "bit" we came across would, said he, make a capital lantern slide; so, rigging up his camera, I focussed sharply and inserted *f*-32, "because, you know, old boy, it must be sharp for a slide." When his back was turned, I, for a joke, racked out his camera at least an inch. He then inserted plate and closed. A few days afterwards he showed me a print, and with such a beaming smile. "Why," I said, "that's not sharp enough for a slide, it is more suitable for the Salon." "Yes, dear boy," he replied, 'that's exactly what I took it for." "But," I exclaimed, "you sa you focussed sharply in order to make a slide," "Yes—ah! yes," he replied, "I did think of doing so at first, but, you know, I changed my mind at the last minute, and thought it would make a Salon picture." And thus it was that my friend's picture came on the walls of the Salon. The picture showed much feeling, &c., said the critics, and perhaps it did, they ought to know. I smiled when I saw it hang there, I smiled when I read the commendable criticisms, I smiled when I saw it reproduced, I smile now as I write of it, and I always shall smile when I think of that great masterpiece and how it was produced. I admire the Salon, I shall always do my best to support it, I think it's nice to have a place to exhibit our failures. Do they not often teach more than successes?—I am, yours, &c.,

P. R. S.

CONCERNING THE ASSOCIATION OF MANUFACTURERS.

To the Editors

Gentlemen,—A circular bearing the heading of "An Association of Manufacturers of Photographic Plates, Papers, and Films" has been sent us, and we have no doubt this circular has been posted to all the photographic profession throughout the kingdom; we therefore wish, through the medium of your paper, to ventilate our opinion and grievance upon this matter. We have been in the "profession" for nearly half a century; we were in it when dealers could be counted on the fingers, and when an amateur was a *rara avis*. The wonderful development of photography has led to the mammoth growth of dealers, amateurs, and the profession generally. Time was when the dealer could call upon the profession, secure orders, and send goods which the profession could resell to the amateur with a fair margin of profit. Times have changed, the amateur has caused a disturbance in the distribution of profits. A dealer is now told off as the middleman from whom amateurs and professionals alike must buy at least their dry plates, papers, and films. The dealer can be what he likes, china merchant, ironmonger, grocer, anything in fact except a professional photographer. Then, he gets a full range of all discounts which are denied to the professional. It does not follow that a dealer must devote all his time and energy to photographic dealing, that may only form a small adjunct. A professional, however, is debarred from any of these discounts, and ranks with the amateur. No matter, although the photographer has a shop, has goods to sell, uses and sells perhaps four or five times the quantity of his opposition, the dealer, his discount is limited to five per cent., while the dealer secures trade terms. Here and now we might ask how many amateurs will buy over 2*l*. worth of dry plates at a time—their order is usually a limited one of perhaps a packet or two—and, granting an order from an amateur of 2*l*. worth, where is the dealer who would not accept it even with the five per cent.? And now are we, because we are professional photographers, to be put on a siding with amateurs, served at the same rates, resell these plates at the paltry five per cent., give hints and instructions to the amateur by the score, while our opponent, the local dealer, who pockets the larger discount, is laughing in his sleeve at us—is this, we ask, fair or just? Let the dealer, if he will (as is the case in our town), sell his half-plate at 2*s*. 1*d*. per dozen, but let the professional also have the same chance. Give him a discount on the same lines, and so prevent a crisis which must come sooner or later.

We find fifteen firms have appended their names to the circular as binding themselves together to keep the dealer right; it would be a pity to add to their number, but another firm outside of this list could easily manage to exist. This we would name the Professional Photographers' Dry Plate Company. Such a firm, dealing direct with the professional photographer on the same lines as the above fifteen firms are dealing with their dealers, could easily hold its own and have a surplus over for its shareholders. It is no use here denying the fact that many professional photographers do know the trade terms of dry plates supplied to dealers, and to those who can read between the lines there are ways by which photographers can secure pretty near the same discounts. But why have to do a thing under cover which the manufacturers themselves can so easily help?

At the best this agreement arrived at by these firms will only hold good for a week or two. Amateurs and professionals alike know well enough that *bonâ-fide* dealers' prices are not altered, and the circular does not say that infringement means stopping the supply.

In conclusion, we would suggest that all professional photographers should be put on the same footing as the local dealer. We do not refer, of course, to wholesale warehouses. If chemists, for instance, can buy from wholesale chemists at pretty much the largest discounts agoing without a question as to their *bonâ-fide* dealing being asked, why should the line be drawn at the profession, who are the largest dealers in the whole trade?—We are, yours, &c.,

W. H. Geddes & Son.

14 *Applegate, Arbroath, April* 3, 1897.

MISLEADING REPORTS.

To the Editors.

Gentlemen,—I have drawn the attention of several gentlemen, belonging to *both* the Croydon Clubs, to my criticism, and to Mr. Hector Maclean's letter, and they all agree that his letter is in no sense a reply to mine.

Allow me to assure Mr. Maclean that I was *not* present at the meeting referred to; had I been, my criticism *of the report* would have been more severe than it was; also, that *I did not*, neither *do I* now, know who the reporter was; and, again, that *I do not* regard Mr. Maclean's Society as a rival one; the methods and aims of the Croydon Microscopical and Natural History Club are quite distinct from those of the Croydon Camera Club.

But, Sir, when Mr. Maclean descends from scientific discussion to abuse, all I can say is, as Mr. E. J. Wall said on a previous occasion, that I will leave him severely alone.—I am, yours, &c.,

St. Leonard's-road, Croydon. J. H. BALDOCK, F.C.S.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Messrs. Bender & Co., 126, George-street, Croydon.—*Photograph of the Archbishop of Canterbury (Dr. Temple).*

RECEIVED.—G. H.; CAMERA; THOS. MILLS; THOS. FALL; Rev. ARTHUR EAST. In our next.

OAK."—We should bracket A. and B. equal.

I. JEFFRIES.—It may be obtained of a suitable strength of any dealer.

COLOUR.—Messrs. Whittaker & Co., White Hart-street, Paternoster-square, probably publish such a book.

PHOKE.—A threat to institute proceedings for the return of the money will probably have the desired effect.

PYRO.—No; you are not too late to make a claim for infringement of copyright, which we should advise you to do.

CERAMIC.—BEGINNER. The enamel sent seems, if the image was as strong as described, to have been considerably over-fired. If you do not get on easily with the substitution process, why not try the powder process?

F. W. TASSELL (Carlisle).—We answered your query in the JOURNAL of March 26. We do not undertake to answer questions through the post, as you may see by reference to a notice which appears in nearly every number of the JOURNAL.

DARK-ROOM LIGHT.—D. JOHNSON. However safe the light may be said to be, the plate should not be submitted to it longer than can be avoided. What may be a safe light with some plates may not be so with others, orthochromatic, to wit.

ACETYLENE.—S. TOYNBEE. In the present state of the regulations with regard to acetylene, we should advise you to wait, the more especially as artificial light will be but little required for enlarging purposes till next autumn, and for that little you can still go on with the limelight.

PYROXYLINE.—W. TURNER. For whatever purpose you require pyroxyline, we should recommend you to purchase it rather than attempt to make an ounce or two at a time. For your purpose we should advise you to get some of Schering's celloidine, which your dealer will procure for you, and it may be sent through the post, which ordinary pyroxyline cannot be.

PHOTOGRAPHING STAINED-GLASS WINDOWS.—E. MOORE writes: "I have been asked to photograph the above. Would you kindly offer a few practical remarks on photographing same? I use the Ilford plates. Would the chromatic plate be best?"—We should recommend you to try chromatic plates; also to back them before use. If there is much blue in the window, it will be well to use a pale yellow screen.

FINISHING BROMIDE PRINTS.—T. W. asks: "Could you kindly give me any information as to materials used for working up bromide enlargements? also could you tell me of any books on the subject, and where to be obtained?"—Ordinary water colours are all that are required. There is no work specially devoted to the finishing of bromide pictures published; however, any work on colouring will answer the purpose.

RESIDUES.—A LANCS PROF. So much has been said on the subject during the last year or so, that we cannot devote more space to it at present. We have said several times that the weight of the ashes of emulsion paper is not to be taken as any criterion of the silver they contain, as they consist largely of sulphate of barium, a very heavy material, with which the paper is "surfaced." The house mentioned is a very respectable one.

STUDIO.—J. WALROND. We can give no estimate as to the possible cost, as so much depends upon local conditions. Sometimes, when the studio has to be erected on another building, it costs more to prepare the place for its reception than to build the studio itself. Better get estimates from two or three local builders for the work. Bear in mind that it is not always the lowest price that proves the cheapest in the end.

PAPER NEGATIVES.—N. A. P. says: "I quite appreciate your remarks a few weeks back on paper negatives, and the non-desirability of waxing them except to get more rapid printing qualities," and asks "if the makers of papers could not help in the matter by coating a thinner paper in the first instance?"—We anticipate that the makers of the papers are fully alive to the requirements of the case, and do employ the thinnest paper they can, consistent with an even coating of the emulsion.

COPYRIGHT.—W. A. You have no copyright in the negative whatever. was not taken by you, but by your predecessor in the business, probably he did not register the copyright. If he did, it must be and legally assigned to you to give you a property in it. The purchase of a copyright negative does not transfer the copyright in it

INDEX TO THE JOURNAL.—F. Sisman says: "I require a copy of the ind and am annoyed at having to apply for one—believe had to do like last year. Why was the old plan discontinued, when index for part of first number for new year? The present system is unbusinesslike."—In reply: We are at a loss to understand why correspondent should feel annoyed. If he will refer to the JOURNAL January 1, 1897, he will see that the index for 1896 was given with

MAL-ODOROUS ALBUMEN PAPER.—C. A. S. says: "I intended to try sitising my own albumen paper, as I have been told that better to are to be obtained on home-sensitised than on the ready-sensitised. got some from ——, but it—well, stinks abominably, and while be sensitised the place is unbearable. Is this usual?"—Not now, as a r At one time offensive-smelling papers were very common, but they not so prevalent as formerly. Stale albumen was more generally ployed than now. Get a good brand.

SELF-TONING PAPER.—PYRO says: "Will you kindly inform me if Mr. E Kehle's self-toning printing-out paper, demonstrated with at Photographic Club, as reported in your issue of March 26, is to obtained in England, or where I could get a supply or particular same? Will you also kindly inform me where I may obtain an inst ment or particulars of same, the 'Echograph,' as noticed in News Notes of your last issue?"—In reply: 1. The paper is not yet obtain in England. 2. Sorry we cannot say.

STAINS ON PRINTS.—STAIN writes: "Can you favour us by explaining by w reason the stains should appear in the accompanying prints? frequently have them. It is toned with carbonate soda, thoroug well washed; salted, washed again, toned (tone rather quic washed after toning, fixed usual bath and time; washed ag alumed, then washed for two or more hours in running water?"—So as we can judge from the prints, the stains are due, either to the us too weak a fixing bath, or the prints were not left long enough in it not kept moving the while.

LENS FOR LANTERN-SLIDE MAKING.—W. WILSON writes: "I want to m some lantern slides from half-plate negatives. I am told that, in mak enlargements, the lens used for the purpose should be such as would t a negative the size of that to be enlarged quite sharp to the corn Does that hold good in reducing? if so, my camera is not long enou but it is if I could use a quarter-plate lens of five and a half inches foc Will that answer?"—Yes. In enlarging and reducing, the cases different. In the latter case, if the lens used will cover the plate size required, that is all that is necessary. The quarter-plate lens do quite well.

ELECTRIC LIGHT IN STUDIO.—ELECTRIC writes: "We purpose fitting our studios with the most powerful incandescent electric light we can and it is on order to be fitted at once, but have been strongly advi not to have it, but an arc light instead, as the exposures are too lo You would do us a great favour by giving us your opinion in Answ in next issue, as rapid work is our speciality, and we have never u electric light before."—One form of light may be had as strong as other, it is only a question of degree. It is only necessary to increase number of incandescent lamps to bring their power up to the arc lig whatever that may be.

SPOTS AND STAINS.—FACTS asks: "Would you kindly oblige by telling through your paper: 1. If hypo used for three evenings, once e evening, is unsafe for C.C. prints. 2. The cause of pink and bl specks on enclosed prints; they were toned in ordinary sulphocya bath, and manipulated throughout according to the Paget formula such paper; the black specks are first noticed in the first washing wa the pink stain when the prints dry. I have been careful to avoid d or anything else coming to them, but the specks will come up u any working. Thanking you for previous answers, and in anticipa of these."—In reply: The spot is clearly due to a particle of for matter settling on the print while washing. This is proved by its b entirely on the surface, and removable with the point of a penk The stain is caused by the print being allowed to adhere to ano while in the fixing bath. It is decidedly unsafe to use the fixing more than once. A fresh solution should be made for each batc prints.

LENS. COLOUR. SIZE.—ROBERT STEIN says: "I should be very thankful if will kindly inform me about the following:—1. I have a Suter apla 52 mm., and find that the focus with a large stop is much shorter t the focus with a small stop. What is the cause of it, and can it remedied? 2. Can you advise me a colour to tint photographs with such a way that the colour is not much noticeable to the naked eye, reproduces when copied with the photograph a darker tint; the objec to make piracy of my photographs as difficult as possible? 3. Can also give me a size or substratum for platinum prints to prevent catching of dirt and dust so easily, as the paper becomes so like blotti paper through the acids?"—In reply: 1. This is the case, more or l with most lenses of the older forms. Focus with a medium stop, better still, with that with which the picture is taken. 2. We know no colour that will answer the purpose that would not materi deteriorate the appearance of the picture. 3. Any size applied to prints would, to an extent, destroy the matt surface of a platin picture, which is one of its beauties.

*** *Good Friday falling next week, we shall go to press a day earlier t usual. Correspondents, please note.*

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EX CATHEDRÂ.

We have received the annual reports of the Photographic Club for the years 1895-96. They form a neat volume of about 100 pages. Readers of our Society news week by week will have already had the opportunity of perusing the Club's proceedings, which have been gathered together in this volume, and constitute an unostentatious record of a great deal of useful photographic work. We may take occasion to remark that the Photographic Club is now in the eighteenth year of its existence. It possesses a library as to the excellence of which we can personally bear witness. The meetings, which are as pleasant as they are informative, take place at Anderton's Hotel, Fleet-street every Wednesday evening, at eight o'clock. The Club includes among its members many able and practical photographers, and is noted for the cordiality with which it welcomes visitors to its meetings.

* * *

There appears to be an impression in the minds of some persons that an attempt is to be made by the Camera Club to attract the membership of professional photographers; and it may be useful to our readers, therefore, if we define the precise position of the Club in connexion with the matter. That position has been the subject of considerable misconception. It will be seen, by the following extract from the official report of the Club's Annual General Meeting, that the introduction of the professional element into the Club is not likely to be of an extensive nature.

* * *

The report says: Mr. Francis Cobb proposed an addition to Rule 2 of the Club Rules, the effect of which, if carried, would be to empower the Committee to elect a professional photographer a member of the Club, if they thought it desirable and if their vote was unanimous, and pointed out that there were certain gentlemen who came within the technical definition of a professional photographer, as laid down by the rules of the Club, who were in all other respects eligible for membership.

Mr. Cobb then moved the following resolution:—"That in Rule 2, after the words 'members,' the following words be inserted: 'The Committee, may, however, make an exception in cases of candidates, whom they may consider specially desirable to be members, but in all such cases the election must be unanimous.'" This was seconded, and the resolution, on being put to the meeting, was passed unanimously.

* * *

The Club's journal has the following comment upon this resolution: "We hope that members will fully realise the effect of this resolution. It in no way alters the constitution of the Club, which remains, as it always has been, a club of amateurs. It is not thrown open to every professional photographer, but the Committee now have the power conferred upon them by the resolution, and members may rest assured that they will use their power with discretion." This official endorsement of the flimsy and artificial barrier that cuts off the professional from the amateur photographer will, we do not doubt, raise a smile, before many years have passed, among those who are now its principal supporters. The tendency of the times is to brush aside class distinctions, and we should be the more hopeful of the future of the Camera Club if it had frankly recognised the fact that the line which separates amateur from professional photographers is, to such intents and purposes as are here in question, quite ignored by common-sense men of the world.

* * *

Mr. Alfred Watkins kindly draws our attention to the fact that the useful little Hand Camera Exposure Meter, which we noticed a fortnight ago, is intended to form a permanent fitting

to the camera. The socket of the meter lets into the top or front of the camera, and the projection of the meter is only a quarter of an inch. This plan, as Mr. Watkins points out, avoids having an extra loose article to carry, but the meter can always be slipped out of the socket for separate use.

* * *

WHAT we regard as a creditable and curious monument of industry has been sent us in the shape of a lithographed portrait of Her Majesty the Queen. This portrait, which is about 31 × 24 inches, is the work of Mr. B. Israel, who took four years and seven months to execute it. The outlines of the picture consist entirely of words, to the number of 173,000, which give a history of the Queen's life. The picture is published by the Diamond Jubilee Publishing Company, of 401, Strand, W.C.

* * *

MR. SIDNEY KEITH, who is known to many of our readers at home and abroad, is holding at No. 6, Farringdon-avenue, an Exhibition of photographs made during his travels in various parts of the world. His Continental wanderings have given him the opportunity of securing, among other results, some capital Alpine views with remarkably fine cloud effects, and views in Venice, Rome, and other favourite haunts of the peripatetic photographer. Probably the best work shown is that obtained in Egypt, the architectural features of that country affording Mr. Keith the chance of getting some excellent studies. Japan, the Yosemite Valley, and English scenery are also illustrated, and the collection includes some views of natural phenomena—one being that of a mud volcano—of great interest. The Exhibition remains open till April 30.

* * *

WE have received an advance copy of the prospectus and entry form of the photographic and photo-mechanical sections of the Paper-makers', Stationers', Bookbinders', Fine-art Publishers', Photographers', &c., International Exhibition, to be held this year at the Agricultural Hall, Islington, North, from June 23 to June 30 inclusive. Although it is one of the conditions that the competitions are equally open to amateur and professional photographers, and the usual Beginners' Class is included, we notice that there are classes which will appeal especially to the professional, such as finishing in black and white an enlarged portrait, not less than 15 × 12 inches, and finishing a similar photograph in colours. The photo-mechanical section includes classes for line drawings, wash drawings, and scraper-board drawings for reproduction. The Judges will be Messrs. T. Bedding, F.R.P.S.; E. J. Wall, F.R.P.S., and H. Snowden Ward, F.R.P.S.

* * *

THE professional photographer has been complaining much of late years, and perhaps with justification, that at exhibitions the amateur interest has been unduly considered, and that his interests have been neglected; but professional photographers have only themselves to blame if anything of the kind occurs at this Exhibition, which is essentially a trade Exhibition, appealing in the first place to those connected with the various trades within its scope. The managers of the Exhibition are not likely, in their own interest, to sacrifice a class which does support them for one which does not, and, unless professional photographers, as a body, show a little more than their usual enterprise, a valuable opportunity will be lost of making the series of exhibitions, of which this will be the first, of commercial importance to those connected with photography. The offices of the Exhibition are at 27, Leadenhall-street, London, E.C.

* * *

ACCORDING to a daily contemporary, the British Museum authorities have decided to establish an Historical Photographic Record and Survey Department, and an official notification of the fact will be made in the course of a few days. It will consist of a gigantic collection of photographs of historical buildings and places, which will be gathered together from all parts of the kingdom. A nucleus has already been formed in a series of photographs of the interior of Westminster Abbey, all taken by Sir Benjamin Stone, M.P.; these Sir Benjamin has just presented to the Museum. This gift is to be shortly followed by a second series, representing the fine old crypt of St. Stephen's Chapel, a corner of the "Aye" lobby, the Throne in the House of Lords, the famous frescoes, and various other points of interest, including two or three meritorious views of the Chamber of the House of Commons itself.

* * *

WE are informed that the Victorian Exhibition at the Crystal Palace opens on May 6, instead of May 24, as originally announced. Those of our readers who are contributing to the photographic section are therefore recommended to hasten the despatch of their exhibits accordingly. As already announced, they should be addressed to Mr. E. W. Foxlee, care of Messrs. Negretti & Zambra, Crystal Palace, S.E.

THE PROFITS OF PROFESSIONAL PHOTOGRAPHY.

IN continuation of our remarks of the 19th ult. on this subject, we proceed to put before our readers an estimate of an imaginary business, doing the highest class of work in the provinces, with a turnover of a thousand per annum—not a mean business as photography is at the present day. Our professional friend to whom we are indebted for it tells us that, if he had foreseen how "big a job" he had undertaken, he would not have made the promise he did, for, being one of the fortunate, whose business returns are counted by thousands instead of hundreds, he found it difficult to make what he considered a reasonable estimate for what he termed a small business. But it is evident that it could only be of comparatively modest businesses that any estimate would be of practical use to our readers. Those who do thousands a year can only have arrived at that position by a combination of artistic skill and business ability, such that we could not pretend to offer advice upon. Our words must be for the many rather than the few.

Before setting down the figures, we may refer to our discussion with the writer upon some of the items.

Retoucher's salary. "Could not the photographer retouch his own negatives?" was our question. "Perhaps if he worked eighteen hours a day. A good retoucher, as his work is done nowadays, will not do more than five cabinet heads a day, and, with retakes and specimens, a business of the size named would need more negatives than that to be done, taking prices at from 15*s.* to 20*s.* per dozen for cabinets. Besides, the man is supposed to be his own operator and dark-room assistant."

"Was there need for a printer?" "Taking sitters, aiding in retouching, superintending work and business generally, printing could not be done by the principal."

Dry plates, 60*l.* "Some may consider this a large estimate, but it is less than my average," we were told.

Depreciation, five per cent. This we thought a small pro-

portion, ten per cent. being, we believe, more usual. This, however, might balance any other excess estimate.

Capital, 1000*l.* "A first-class business would need all that for furniture, fittings, apparatus, lenses, &c."

Interest of capital, 40*l.* "Well, if the man had a thousand pounds, and took a situation, he could put his money out at interest, so it would not be fair to estimate it as a profit. This estimate is intended to show actual trading profit, and such as compared with an operator's salary."

The above excerpts represent our objections and the replies we received. We now append the actual figures given to us:—

ESTIMATE OF ANNUAL EXPENDITURE.

(Comparatively fixed items.)

	£	s.	d.	£	s.	d.
Rent				100	0	0
Rates and taxes				25	0	0
Fire insurance 1000*l.* stock ——— ——— 1000*l.* negatives at 5 per cent.				10	0	0
Plate glass insurance				0	10	0
Water rate by meter				7	10	0
Gas for illumination, fires, &c.				10	0	0
Coal				10	0	0
Salaries—	£	s.	d.			
Printer weekly	1	5	0			
Retoucher	1	10	0			
Reception room	1	5	0			
Girl assistant	0	6	0			
Errand boy	0	4	0			
Charwoman and cleaner	0	6	0			
52 weeks at	4	16	0			
				248	12	0
Gratuities, say	2	8	0			
Repairs of premises and replacement of apparatus	15	0	0			
Papering and painting of premises, inside and out, say, 30*l.* every three years	10	0	0			
Local subscriptions	5	0	0			
Washing for dressing-rooms, &c. Soap, &c., &c.	5	0	0			
Advertisements and circulars	10	0	0			
	47	8	0			
				459	0	0

VARIABLE ITEMS.

(Depending on business done.)

Artists and enlargers	40	0	0			
Silver and gold, less sum obtained for residues	15	0	0			
Plates used for sitters, for experiments, and for specimens	60	0	0			
Albumenised, printing-out, and platinotype papers, and carbon tissues	25	0	0			
Mounts of all sorts	30	0	0			
Frames	10	0	0			
Chemicals, varnish, &c.	25	0	0			
Carriage of various goods and empties	10	0	0			
Stationery, printing, &c., including brown and tissue papers, post wrappers, *étuis*, twine, wax, price-lists, writing paper and envelopes, &c., &c.	25	0	0			
Ledgers, reception-room and printing-room books	2	0	0			
BRITISH JOURNAL OF PHOTOGRAPHY and photographic literature	2	0	0			
Opal glass and ivory	0	10	0			
Postage of pictures, &c.	20	0	0			
Petty cash and sundries of various sorts, say	20	0	0			
Unenumerated and unexpected items, say	20	0	0			
				304	10	0
Depreciation of stock, 1000*l.* at 5 per cent.				50	0	0
Interest on 1000*l.* capital at 4 per cent.				40	0	0
				853	10	0

PROFIT ON 1000*l.* TAKINGS.

£	s.	d.
1000	0	0
853	10	0
Profit, 146	10	0

In conclusion we would again remind our readers that this imaginary business estimate is given for one conducted on fair business principles, working, say, eight hours a day. If worked on the family principle and without regard to personal health, continuing early and late, the estimate could be modified greatly.

Finally if individual readers, whose name of course would, if desired, be held strictly secret, would give any personal experience for or against these figures, their value would be increased tenfold.

A Very Salutary Law.—The New York State Legislature has passed an excellent Bill. It prohibits any newspaper printing the portrait of a person without having previously obtained the consent of that person, and in writing, too. Any paper infringing this law is liable to a very heavy penalty. We could do very well with such a law here, as it would prevent the appearance of the atrociously bad portraits we see in some of the cheap newspapers, and which often cause considerable annoyance to those portrayed—or rather attempted to be portrayed. Possibly our Legislature may, some day, take pattern from that of the State of New York.

Two Hundred Thousand Portraits valued at Five Francs.—A somewhat amusing judgment was given in Paris, one day last week, in an action brought against the Prefect of Police, for having illegally seized 200,000 portraits of the Duc d'Orléans. The Court ruled that the seizure had been illegal, and condemned the Prefect to restore the portraits, or pay their equivalent in money. As, however, "they were devoid of any artistic merit, and were of no marketable value," the Court, knowing they had been destroyed, assessed their value at five francs, and also ordered the Prefect to pay the plaintiff one franc as damages. From this it would seem that the value of portraits "devoid of any artistic merit" is appraised very low indeed in Paris. That is not always the case here.

More Pictures Stolen from National Galleries.—Last week we mentioned that two pictures, one of them a Murillo, had been stolen from the National Collection at Buda-Pesth. Since that theft was committed, another picture has been stolen from the Madrid Picture Museum. It is the preliminary sketch of the original picture by Murillo, entitled *St. Anne giving a Lesson to the Virgin.* Curiously enough, the original was hanging but a short distance away, and it is thought that the thieves mistook the one for the other; hence it is thought that they have but little knowledge of works of art. It is surmised by the authorities that the robbers are in league with those who stole a Murillo in Vienna a short time back. It would seem that the thieves, whoever they are, have a *penchant* for Murillos. It is difficult to conceive where the thieves can find a market for pictures that are already so well known in National collections. Last week the thieves, if they be the same, visited Paris, and managed to purloin four pictures from the Salon, that were waiting to be hung in the Palais de l'Industrie. The authorities of our National Galleries need be on the alert, as the same gang may honour this country with a visit. It is said that these and other stolen pictures find their way to America.

Resuscitation of Miniature Painting.—At the meeting of the Court of Common Council, last week, a letter was read from Mr. H. N. Crawford, asking the acceptance by the Corporation of a miniature of the Queen, which was a replica of that recently presented by her Majesty to the Empress of China. The artist was Mrs. Courbould Ellis. The gift was, of course, accepted with thanks, and it is deposited in the Guildhall Art Gallery, where it may now be seen.

WE have, more than once, referred to the revival of miniature painting, and the encouragement it is receiving in high quarters,

and suggested that portrait photographers should give more attention than they do to high-class coloured work. It is not every one who can afford from, say, ten guineas upwards for a miniature painting but they would pay a good price for highly finished photographs, such as used to be produced years ago, and which are not forthcoming now if they were required. At the period we refer to, the work was executed upon an unstable base—the silver image. That need not be the case now, for we have the platinotype process, and the surface of a platinum print is a most excellent one for the artist to work upon. We suspect, however, there are few artists nowadays that are capable of doing very high-class work of the old kind. Photographic colouring, of late years, has been much neglected; indeed, of the highest kind, it seems almost to have become a "lost art."

Intensification of Emulsion Plates with Copper.—We have frequently heard it said that the bromide of copper intensifier, so much used by process workers, is of no use with emulsion plates, and we had well-nigh come to accept the statement as an undoubted fact. We have recently, however, had good reason to materially alter that opinion, inasmuch as we have traced the unsatisfactory behaviour to its proper cause, though perhaps we have not yet discovered a full remedy, so far, at least, as gelatine plates are concerned. The main reason of the uncertain and unsatisfactory character of the intensification with copper is, we think, to be attributed to the employment of hypo as the fixing agent, and the difficulty of thoroughly getting rid of it and its compounds.

We have experienced the same difficulties with collodion emulsion as with gelatine, and so came to the conclusion that it was the emulsion, *quâ* emulsion, that was in fault. A few days ago, however, we were compelled to resort to copper, having no other method handy, and were surprised to find it answer most admirably, the plate being a collodion one, and the only departure from regular routine being the use of cyanide instead of hypo. This we found on trial to be the difference between failure and success.

Cyanide, however, does not form a good fixing agent for gelatine—at least we have never considered it so—but possibly it might be found amenable to a little study and coaxing. However, a second fixing in clean, fresh hypo after a partial washing, and followed by a very thorough washing, very materially improves matters, and renders the copper method a practicable one for gelatine negatives when great density is required.

One other hint may be given for the benefit of those who use the bromide of copper intensifier, namely, to keep the negative at least out of strong daylight during washing and while in the bleached condition. If a very strong light be allowed to act upon it while in that stage, it very often refuses to intensify, or does so but partially and irregularly.

Deterioration of Glass.—The meeting of the Photographic Club last week was an interesting one, when one of its members, Mr. E. W. Foxlee, explained *Some Objects of Interest in the Club's Museum*, of which there are many. The expositor dealt with them as they were taken from the drawers, explaining the methods by which they were produced, and other points of interest in connexion with them. Alluding to the Daguerreotype process, he gave some useful hints on "restoring," or rather cleaning, Daguerreotype pictures. He showed one that was probably taken in the very early "fifties" that was, apparently, in a very bad state, but in a very few seconds it was "restored" to its pristine state. All that was done was to remove the picture from its case, separate the cover glass and clean that, and then replace the whole as before. It was the glass that had protected the Daguerreotype that had deteriorated, and not the picture itself; this was as good as it ever was. The surface of the glass, though cleaned, showed that it was considerably eroded. Some years ago, about the time that probably this picture was taken, a colourless glass was introduced specially for glazing coloured and other delicate pictures; but it was soon found that it "sweated," and that, after a time, the alkali actually crystallised out on to the surface. That was what had happened in this case, and, although the glass was cleaned, it was no use for its purpose, as the surface was thoroughly corroded. This deterioration of glass is not confined to the kind used for glazing purposes, as it sometimes occurs with optical glass. Some time back one of the members of the Club showed some microscopic objectives, in which some of the new Jena glasses were used, that were quite worthless. The surfaces had become so eroded that they more resembled ground than polished glass. Many of the glasses in the old cheap French portrait lenses will be found to be covered with "bloom." We were recently shown one of the new type of lenses, for which a large sum was paid, one component of which was made of one of the Jena glasses, the surface of which was considerably "rusted," and showed strong iridescence in an oblique light.

THE USE OF A DARK-ROOM WINDOW LOOKING INTO THE STUDIO.

"'Tis pleasant through the loop-holes of retreat
To peep at such a world."—Cowper.

It was once my good fortune to have a studio so long that I could afford to cut a piece off one end of it for the dark room. I placed the door in the middle, so that for extra occasions, when necessity demanded the entire length, I could place the camera inside the dark room. It was only under the rarest circumstances—as, for instance, when a large group had to be undertaken—that this expedient became necessary. The window was near the door, and overlooked the entire studio.

It did not take me long to discover that, besides its first purpose of admitting light, it played another part of the highest importance, it enabled me to study the characteristics of my sitters when they were completely unconscious of my scrutiny. As time went on, this became quite a new power in my hands. Frequently the most graceful poses were seen through the orange window during the preparation of the plate—for in the old wet-plate days at least five minutes were consumed before it was ready for the dark slide—and frequently, by a little artfulness, I could induce the sitter to assume the pose I had admired without revealing my source of inspiration.

Experienced portrait photographers know only too well that self-consciousness is the great stumbling-block when dealing with pose; and, the higher the mental capacity of the sitter, the more does the *ego* block the way to artistic results. Children are generally graceful, particularly in the pose of the hands, simply because the cultivation of the *ego* has barely commenced. Wherever the forcing process has been adopted—as in the case of the spoiled child—the grace of nature has departed, and in consequence the task of the photographer has become anything but an enviable one.

A striking case where the window was useful in helping me to success in dealing with a very self-conscious sitter comes fresh to my mind at the present moment. The sitter was an artist of distinction, but horribly nervous and self-conscious. His knowledge of all the artifices of the portrait painter only added to my difficulties in dealing with him. He frankly admitted that he hated sitting, and had only consented to do so to please some importunate friends. I gave him an interesting book to calm down his impatience during the time necessary to prepare the plate; through the yellow window I could see him gradually quiet down, as the pictures in the book arrested his attention. The profile presented to my view was an unusually fine one, and an ample beard gave increased dignity to a leonine head; one elbow was resting on a table, and the upraised hand supported the pince-nez on the nose, whilst the other was engaged in turning over the pages of the book. Here was clearly my pose, for nothing could possibly be more simple and natural. Of course, the pose had disappeared on my appearance with the plate, and the nervous im-

ıtience had returned. In answer to his question as to what the ›se should be, I suggested that it should be one of complete repose, ıd proceeded to pantomime the pose I had seen. He settled himself ›wn to it, and, when I suggested that he should support the eye-asses with his hand, he expressed his astonishment that I had by ›cident hit upon his favourite habit of sitting when reading. I told ım to read on, but to keep the leaves of the book from fluttering, ıd, when I saw him thoroughly interested, I made the exposure. he result was an immense success, and circulated by hundreds.

It can readily be imagined that the unsuspected window occasion-ly furnished me with some very pretty pictures, and sometimes ›me very droll ones. I had taken care, by the arrangement of some ! my studio accessories, to take off the sitter's attention from it. rom the outside its surface was so dark, and so highly polished, ıat it resembled a "Claude" mirror, and was frequently employed a looking-glass by my sitters of the fair sex. On one occasion ıe nerves of a pupil were severely tried; during the preparation of ıe plate, a charming actress, who was to be my sitter, suddenly etermined to use the window for a mirror; just at the moment 'hen I was lifting the plate from the nitrate bath, my pupil con-ulsively clutched my arm, thereby nearly throwing the plate from s rest, and in a whisper exclaimed, "She is a cheeky one, with a engeance, she is pretending to kiss me through the glass." A glance xplained the situation. She had a beautiful mouth and perfect ›eth, and had come close up to the glass, either to examine them or › practise her most bewitching stage smiles. It was quite evident ıat she had not, for a moment, imagined the glass was transparent. 'he nerves of my pupil had a shock, however, for the space separating ıe two mouths was slight indeed.

On another occasion a fond mother came, accompanied by two ouncing girls bubbling over with exuberant health and good spirits. weet seventeen for one, and about nineteen for the other, would robably be the dates to affix to them. They were all perfectly at ome with me, for I had photographed them several times before, so ıey gave themselves up to the maddest fun, and paid little heed to ıe mild reproof administered to them from time to time by the enial, easy-going mother. Several pictures had to be taken, and to ll up the tedium during one of the intervals one of them proposed game of "weigh butter." This is a game known to the younger pecimens of humanity under various names, but had better be escribed for the benefit of the ignorant. The performers place hemselves back to back, and then link their arms, so that they are oth tightly attached to each other. One stoops, and the quick ction throws the legs of the other high in the air; but in turn the ther does the same, so that practically it becomes a game of see-aw, and the rounded backs supply the fulcrum for the leverage. 'hey speedily warmed to their work, and shouts of laughter clearly howed how much they were enjoying the fun. It must not for a ıoment be supposed that the game was indecent, for it was idyllic n its simplicity. From my point of view it was distinctly *piquant* ıowever. Remonstrance from the fond parent was all in vain ntil she said, "I believe your antics can be seen from that funny ittle window." This suggestion at once brought the game to a lose. After the next picture had been taken, the elder girl said, What a funny place you appear to work in! May I have a peep?" assented, and she peered behind the door; but, when she saw her ıother and sister, as well as all the objects in the studio, covered vith an orange glory, but perfectly visible, she uttered one exclama-ion only, but with the most comic emphasis. She simply said, 'Oh!!!"

What transparent humbugs lovers are! and they are blessed with he artfulness of the ostrich, who thinks when his head is buried in he sand that the rest of his body is invisible.

The following illustration, at any rate, will go a long way in proof f the statement. A pair of fond lovers were anxious to show all hose whom it may concern, and of course a good many more esides, how attached they were, and therefore a group became ıecessary as evidence. Various poses were suggested, and finally he matter was left in my hands. Whilst I was busy in the reparation of the plate, a sudden, but not altogether unfamiliar, ound arrested my attention. It was not quite like the sound produced by the drawing of a cork, or that given out by the saw when going through hard wood, or that of a plane in the act of making shavings. The sound in fact cannot be described, but perhaps a mixture of the above-mentioned might, however, be taken as suggestive. A glance through the window explained all. Two pairs of lips were glued together, but the apparently firm contact did not seem to be painful, in fact, to judge by the expression on the faces of the owners of the lips, they seemed to like it. At any rate they repeated the operation with mutual satisfaction. When the dark slide and I came forth into day light, the pair were in another part of the studio, and Angelina was listening with eager attention to a lecture on entomology with an object-lesson in the shape of a fly struggling in the meshes of a spider's web before them, and apparently the lecture had been going on for half an hour at least. Plenty of amusing scenes might still be added, but the above may be taken as samples.

To take the sitter quietly into custody without letting the handcuffs be visible is really a fine art, and can be acquired in perfection only by a few; but, without doubt, to be able quietly and unobserved to study the salient points of the sitter would be one of the most important aids to success, and therefore, I would say in conclusion, let all those who can manage such an arrangement of dark room as I have described do it, and they will not be long in discovering its extreme utility.

VALENTINE BLANCHARD.

COLLODIO-CHLORIDE EMULSION FOR TRANSPARENCIES.

FROM the very earliest days of the collodio-chloride process it has been the custom to speak of it as an admirable method of making transparencies, and yet how seldom do we see any results produced in this manner. The ordinary print-out emulsion is now referred to, as, if an emulsion for development be required, one of silver bromide is infinitely to be preferred.

The reason why collodio-chloride transparencies are so seldom met with is, no doubt, to be found in the fact, that the emulsion as usually compounded is anything but suited to use on glass or to the formation of a smooth, structureless film when viewed by transmitted light. In the first place, the large amount of crystalline matter it contains is against its drying evenly on the non-absorptive glass surface, or, if it be dried with a semblance of evenness, retaining that evenness for very long, owing to the tendency of the different salts it contains, some to crystallise, some to deliquesce, and all to interfere materially with the smoothness of the film. Add to this, that the excess of acid, sometimes unnecessarily large, used for the double purpose of giving vigour to the image and keeping qualities to the emulsion, exercises a specially injurious action on the collodion, rendering it thick and viscid, with a tendency to flow in ridges, and to dry in much the same state in too painfully visible crapy lines.

Another point that may perhaps have some bearing on the matter, though it does not directly affect the quality of result, is the character of the chloride used in making the emulsion. On account of their easy solubility in alcohol, and for other reasons, certain chlorides, such as those of calcium, barium, and zinc, are often used, and these, although they may not at once confer any bad qualities on the emulsion, will sooner or later cause it to clot together and lose its fluency and eventually become solid. Unless, therefore, a quantity of emulsion is to be used up at once, the greater part of it becomes useless, which is naturally not a recommendation in favour of the process.

In making an emulsion, therefore, specially for transparency purposes, we should endeavour to steer clear of these difficulties, and, in fact, in every way work in the direction of a preparation that will adapt itself to the exigencies of glass. But perhaps the first point to be considered is the pyroxyline, for without a suitable sample of this all further efforts are without avail. The best sort for collodio-chloride is a very soluble sample, and, such being obtained, the first step should be to ascertain how large a quantity can safely be used without causing a crapy and unsightly film. One great fault is that too small a quantity of cotton is too often used, which, though it gives a smooth and easy-flowing emulsion, and one quite suitable for paper, is too thin both to hold the salts without crystallising and to give the density necessary in a transparency. Therefore ascertain, first of all, the maximum quantity of cotton the collodion will bear. This should, with a good soluble sample, be not less than nine or ten grains to the ounce.

The following formula is one that has given very good results, both

on glass and on paper, flows and dries well, and keeps for some months without becoming thick:—

Pyroxyline	100 to 120 grains.
Ether, methylated (·720)	5 ounces.
Absolute alcohol	5 ,,
Chloride of sodium	15 grains.
Citric acid	20 ,,
Nitrate of silver	90 ,,

Dissolve the cotton in the ether and three ounces of the alcohol, reserving two ounces of the latter for the solution of the salts. When the cotton is dissolved, add the citric acid in crystals, or it may be dissolved before making the collodion in the three ounces of alcohol. When dissolved, the silver may be added. This is first dissolved in about forty minims of water by boiling in a test tube, and one ounce of alcoho gradually added, warming it to prevent precipitation of the silver. Pour this a little at a time into the collodion, and shake well after each addition; this will produce a white milky emulsion, partly from formation of citrate of silver and partly from precipitation of the nitrate in minute crystals. Next dissolve the chloride of sodium in the same quantity of water, carefully washing out the test tube first, and add the remaining ounce of alcohol; pour in in the same manner as the silver, and shake vigorously for two or three minutes, and afterwards at intervals. In an hour's time the emulsion may be filtered through a piece of clean calico or linen, and is ready for use, but it will be better in a few hours' time.

Chloride of lithium, in the proportion of ten grains instead of fifteen, may be used instead of the sodium salt, though the latter is to be preferred if absolute alcohol and ·720 ether can be obtained. If not, the lithium salt, being easily soluble without the aid of water, saves the addition of the second forty minims, and thus improves the flowing qualities of the preparation. If the image prints too red in colour, two or three drops of strong ammonia may be added, and thoroughly well shaken.

Collodio-chloride on glass is very difficult to work without a substratum, owing to its strong tendency to peel off. The substratum may consist of a plain solution of gelatine, three grains to the ounce, poured on to the glass warm, drained, and allowed to dry in a place free from dust. In addition to causing the film to adhere firmly during washing, toning, and fixing, the substratum also helps, by absorbing the crystalline matter, to prevent crystallisation and unevenness in drying.

Glass plates should, however, never be prepared beforehand, as, owing to the hygroscopic nature of the matter contained in the film, it is impossible to avoid deliquescence and crystallisation unless they be hermetically sealed. It is an easy matter, however, to coat the glass at the time of use, and, if dried by heat and the negative also warmed, no trouble need be feared from any of the causes of unevenness. The transparencies should be toned and fixed as soon as possible after printing. Any of the usual toning baths will answer, acetate, phosphate, or tungstate giving the best results.

W. B. Bolton.

THE NEW "STIGMATIC" LENS (*f*·6).

[Read before the Royal Photographic Society.]

The optical properties of certain of the glasses manufactured at Jena now at the disposal of opticians, are probably now so well known to all interested in optical research, that it is hardly necessary to refer to them again at any length before the members of this Society. The old glasses known as "crowns" and "flints," on account of a certain invariable characteristic, conveyed to the mind that a "crown" was invariably a converging lens, and a "flint" a dispersing lens. This was necessitated by the fact that, in these older kinds of glass, the higher the refractive index of the glass the higher was the dispersive power. So long as this condition obtained, opticians had to use their utmost skill in arriving at the best compromise between the elimination of the two inherent defects, curvature of field and astigmatism in the lenses they constructed. These older kinds of glass allowed, however, of a fine correction for spherical aberration with a high ratio of aperture to focal length. The classic work of Petzval in this direction will always live in the history of the subject, and appeal to the admiration of every earnest student.

The eminent experimental work in glass manufacture conducted at Jena, and the valuable results arrived at, have now been known for some years. "Crown" and "flint" no longer retain their old significance, and differ from the still indispensable older kinds manufactured by Messrs. Chance, of Birmingham. Dr. Hopkinson, when advising the firm, rendered very valuable aid in making special glasses, and to-day Mr. Stobart is devoting much attention to a still greater choice. I make this digression, for, although in all scientific work jealousy happily does not exist, I venture to think that, if technical investigation had been, and was, as strongly supported in this country as in Germany, the remunerati industry of optical glass-making need not have had to take secon honours.

Briefly, we now have at our disposal glass that has a higher refracti index than another, but, at the same time, lower dispersive power and have to thank Professor Abbé, and Messrs. Schott & Co., of Jena, f this valuable addition to our resources. This possibility opened a entirely new field in optical research. Opticians saw at once their way eliminate the error of "astigmatism," and at the same time to arrive what is known as a "flat field," or to eliminate "curvature of field."

Many individual brains were at work when the new material was obtai able, and many were the heart burns at one worker antedating another the Patent Office in work he could never get at least credit for.

The first to publish and patent a lens necessitating and utilising th employment of the new glass was Dr. Schröeder in his "Concentric" len a lens that well merited its cordial reception. Its only fault lies in i low intensity, the properties of the new glass being such as to prohibit th same "angular apertures" as are obtained with the older glasses, em ploying only two kinds of glass in a symmetrical form, though it is un accompanied by the inherent defects involved in using the latter referre to above. Following this lens, other workers have taken advantage both new and old glasses in their different lens systems, and constructe various forms in which each combination of the lens consists of thre four, and even five lenses cemented together. These include the pr duction of lenses by Messrs. Zeiss, Von Höegh (Goerz). Voigtlände and others. The angular apertures of these constructions are known t you.

The construction of my colleague's lens, the "Stigmatic," differ essentially from the work accomplished by our foreign contemporaries

In March of last year Mr. Aldis described to you in his paper how h had arrived at the construction of a "portrait lens" with an apertur of *f*·4, practically free from astigmatism and curvature of field, an dealt pretty fully with the question of "astigmatism."

It is not necessary to traverse this ground again, but he made referenc then to the work (Sir G. B. Airy on the spherical aberration of eyepieces) the only available work at present published in the English language dealing with the constructing of lens systems with a flat field free fro astigmatic aberrations of the marginal pencils.

In this communication to the *Philosophical Transactions of the Roya Society*, Sir George Airy gives as the necessary condition for a system o very thin lenses ranged along a common axis as

$$\frac{f_1}{\mu_1} + \frac{f_2}{\mu_2} + \&c., = 0$$

where f_1, f_2, &c., are the focal lengths of the component lenses, and μ_1 μ_2, &c., the refractive indices of the glasses of which they are composed. Sir George does not seem to have investigated any means of satisfying this condition; on the other hand, he would appear to assume that it cannot be satisfied, as indeed is practically the case in the particular case under his notice, viz., eyepieces for telescopes and microscopes.

Fortunately, however, in the case of photographic lenses this condition can be more successfully fulfilled, though with increasing difficulty as the ratio of aperture to focal length is made greater.

It should be noted that the form of this condition has to be altered when the thickness of the component lenses is allowed for, but the general effect of this condition is that to obtain "flatness of field" without astigmatism, in general requires the use of converging or positive lenses of high refractive index and diverging or negative-shaped lenses of low refractive index. This, howaver, as referred to before, introduces difficulty into the correction for spherical aberration, which in general requires the use of the older glasses, or negative lenses of high, and positive lenses of low, dispersive power—the exact opposite of the former.

In most "anastigmatic" lenses hitherto constructed, the correction for spherical aberration has been arrived at by the employment in part of the construction of a negative lens of high refraction combined with a positive lens of low refraction, thereby prejudicing the correction for "astigmatism." In the Stigmatic lens shown to-night the converging lenses are throughout of high refractive power, and the diverging lenses of low refractive power (the point in which Mr. Aldis's lens differs from any hitherto constructed), while the correction for spherical aberration is given by a small (convex meniscus) air space in the back lens, very much on the same principle of my late father's "patent" portrait lens introduced in 1866. By this means the correction for astigmatism can be very completely carried out, even in lenses of very high intensity, viz., in the Stigmatic *f*·4, as has been already shown at this Society.

The form of the lens *f*·6, I call to your notice this evening, differs somewhat from the Stigmatic portrait form at *f*·4, and covers a circle of illumination about 25° more, viz., 85° as against 60°. Over the complete angle of 85° the deviations from perfect flatness are most minute, so that the lens may be either used at full aperture, *f*·6, for all classes of instantaneous work, both indoor and outdoor, over a plate whose diagonal equals the focal length of the lens (a size which is found in practice to include an angle sufficiently large to give the best effects of perspective), or with slight stopping down to secure even illumination over plates whose diagonal is nearly twice the focal length—a size of plate relatively large enough for most wide-angle work, in either case with perfect marginal definition.

I submit examples of work done by the lens to your notice. My friend, Mr. Kapteyn, was kind enough to allow me to avail myself of his very perfect testing arrangements.

The lens tested by Mr. Kapteyn and myself was one of 7·6 inches focus, constructed for use under ordinary circumstances upon the half-plate. The tests were made upon 12 × 10 plates. You will see, from the negatives or prints, that a considerably larger plate than the half-plate is perfectly covered at the full aperture *f*·6, and you can also observe the effect of "stopping down."

I show you Mr. Kapteyn's method of comparing the effect of the use of the diaphragm at four different intensities on one plate, at the same time making the test apply to the performance of the lens over the entire plate and not only one-fourth of it. It is a particularly pretty way of carrying out these tests, even if it should prove that it is not new. Personally, I am much indebted to Mr. Kapteyn for the very excellent work he has done towards simple and accurate methods of practical lens-testing.

You will observe that little, if any, benefit is derived from the use of the diaphragm over the 10 × 8 plate except as regards equality of illumination; the 12 × 10 plate is well defined at *f*·22, and I did not think, after the equality of illumination shown at *f*·32 over the 12 × 10 plate, that it was necessary to exhibit plates taken with smaller stops.

The front combination of the lens can be used alone with the stop in front, forming a good "narrow angle" lens working at about *f*·20 on the half-plate, the focus being about half as long again as the entire combination. In the lens, then, you have—(1) great rapidity and absolute definition over a plate including an angle generally chosen for most subjects; (2) the possibility of using the lens on much larger plates as a "wide angle" lens with but moderate stopping down; and (3) the possibility of using the front combination as a single lens, giving a "narrow angle" upon the size of plate for which it is constructed as an optical system in its entirety.

I show you the difference in detail in the constructions of the *f*·4 and ·6 "Stigmatic" lenses. The latter is of great simplicity. The whole consists of a five-lens combination. The front combination consists of two lenses cemented together, the outer one a double convex lens of heavy baryta crown, and a double concave lens of light silicate flint. The back combination consists of three lenses, two of which are cemented. Inside is a double flint lens of light silicate flint cemented to a double convex of heavy baryta crown, and behind these, with a small air space, a meniscus flint also of a light silicate flint.

From the manufacturers' point of view, these double convex and double concave glasses are more readily worked and much easier to centre than the deep meniscus glasses used in other forms of lenses.

Another and important feature is that the lens has no "zones." That is to say, if focussed with full aperture, no readjustment in focussing is required if a smaller diaphragm be necessary to obtain "depth of focus."

THOMAS R. DALLMEYER.

ON THE AVOIDANCE OF REFLECTIONS.

I.

Among the many difficulties that beset a photographer who has to undertake general all-round work, and which frequently embraces the dealing with objects having glazed surfaces, not the least troublesome obstacles to overcome are those classed under the category of ghosts or reflections, for there is no doubt these unpleasant visitors often tax the skill and patience of an operator to a very great extent.

To attempt to describe a tithe of the subjects in which reflections have to be dealt with would, in itself, be no light task, for where is the photographer that, at some time or other, has not been driven to his wits' end before some means have been devised, when working away from his studio, whereby he gets rid of such. As a rule they put in an appearance, more or less, when dealing with oil paintings, framed engravings, glazed photographs, and all other subjects whose surfaces act as powerful reflectors of light, no matter whether the same be that of ordinary daylight or some well-arranged system of artificial lighting.

In dealing with some kinds of subjects, such as oil paintings or glazed pictures, a few well-recognised rules exist, and which are largely followed by those workers who make a speciality of photographing these kinds of objects.

Not only has particular attention to be bestowed upon the mode of lighting, but care has to be given towards the removal of any adjacent objects that are liable to be reflected from the surface of the object being photographed; in addition to which, there is another very important factor that writers seldom or never draw attention to when discussing these difficulties in the photographic press, *i.e.*, the employment of the most suitable kind of lenses for the work; in fact, it looks as if much misconception exists on this very point, for it is over and over again looked upon as a *sine-quâ-non* that wide-angle lenses should be employed. Now, I make bold to assert that no greater mistake can be made than the employment of short-focus lenses, as a general rule, for the copying of objects that give trouble in the shape of reflections.

To those workers who are desirous of proving the truth of this assertion the following experiments will prove instructive, and should go far to dispel the belief that exists in the employment of short-focus objectives for copying purposes:—

Let an ordinary painting or other suitable test object be placed in position under any side or top light as is usually employed for such work, or, if the operation be conducted in an ordinary sitting room, say, with one window having a northern exposure, this may mean to get the best amount of light upon the picture, the same will require to be placed somewhere at right angles to the source of light, at a distance of about five to six feet from the window sashes. In this position let the picture be placed so as to present as equally lighted a surface as possible; then, say, a whole-plate negative has to be produced from the same, let the operator proceed to take any suitable wide-angle objective of what is termed short focus, and, by means of such, throw the image of his picture on the ground glass of his camera.

A careful examination of the same will more than likely display the fact that ghosts or reflections are present, which, on casually observing the appearance of the picture before employing the lens on the camera, were not noticed. These ghosts are nothing more nor less than certain portions of the window or its surroundings being reflected back into the camera from the surface of the picture, and, as these are fixtures, it stands to reason they themselves cannot be removed; so some other means must be employed to get rid of them. Now, in all copying work, it is generally of the very first importance that the surface being copied must be evenly lighted; we have already seen that this has been carefully attended to, so any removal of the picture from its best position, as regards lighting, would tend to introduce another equally disastrous effect, viz., unequal lighting. Therefore, to a certain extent, an operator is tied down within very circumscribed limits as to the extent to which he can alter the position of the object in relation to the source of light, when any reflections are shown on the ground glass of the camera.

Any intelligent worker will, of course, satisfy himself whence these annoying reflections or false images proceed as soon as they are discovered. In some instances they may be traced to movable objects in front of or in close proximity to the object, in which case the removal of the source whence these images proceed will effect a cure; but, as we have seen, they frequently proceed from points of light that are fixtures, and therefore are impossible of removal.

When it is found that such ghosts are impossible of avoidance when working with lenses of such short focal length, then let an objective of much longer focus be brought into operation. This means the withdrawal of the camera to a greater distance from the object, so as to yield an image of the same size as was being produced by the shorter-focus lens; but, if the substituted lens be of sufficiently long focus, the insertion of the same in the camera will produce an image on the ground glass in which not a particle of the reflections, so prominent with the previous lens, is visible. The reason for this is obvious, and depends upon a well-known law on optics, which need not here be stated.

Long-focus objectives play a most important part in overcoming these eyesores or false lights, and they should invariably be employed in preference to short-focus instruments for this kind of work.

There are, however, very many other subjects that give a considerable amount of trouble, the surfaces of which are not flat as in the case of pictures or similar objects. Among these may be mentioned bottles with glazed labels, and suchlike articles, in shape or form. Articles of this description frequently cause a lot of trouble when they have to be photographed under circumstances where an operator is tied down to any one source or disposition of lighting, and it is therefore preferable to employ a well-devised plan of artificial lighting when dealing with such.

Many years ago, when experimenting with closed chambers for making reduced positives from negatives by artificial light, I hit upon an excellent plan of copying numerous articles whereby all troublesome reflections were overcome. The plan I adopted was the using of panels of white plaster of Paris, placed in such positions as to form an oblong box, the front panel having an aperture for the copying lens to work through. By employing these panels in suitable positions, and, by placing a couple of powerful paraffin oil lamps *in a line with* the object being copied, it will be found that there is an entire freedom from flare or reflections. When using these panels, it will be found that a beautifully soft, diffused light is thrown back upon the object from the plaster of Paris front panel, and, if the lights are not placed too far forward, there need be no fear of any ghosts. Quite a long list of articles could be enumerated that are capable of being dealt with by means of artificial light and these plaster panels. The value of good paraffin lamps for many kinds of subjects has long been known to some workers; they can be placed in any desired position, a by no means unimportant factor in very many instances when dealing with certain kinds of articles that are fixtures.

Another difficult class of subjects is that of objects contained in glass chambers, such as specimens preserved in spirits, or, say, that of gold fishes in a large globe of water. Subjects of these kinds have been known to cause no end of bother to those unacquainted with the best mode of treating such.

As a rule, transparent objects of this description are best photographed up against the light; by this means any of their contents are entirely free of flaw or reflections which would mar their form or appearance.

Another instructive experiment for any one to undertake when dealing with subjects of this kind is the following: Say a bottle containing some

object in a transparent fluid has to be photographed, let such be placed in varying positions in front of any window; no matter from what point of view the same be looked at, so long as the light falls upon the object from certain directions, there will always be more or less distinct reflections from the surface of the vessel. Let a semi-opaque screen, such as tissue paper, however, be placed up against the window, and the object placed between such and the eye, then quite a different state of things exists; there are no more reflections visible to mar the contents, and in such a position the same may be photographed with advantage.

Some workers employ a preponderance of top lighting in conjunction with a series of front screens or tunnels for such work, and by this means cut off all back light. In any case, direct lighting is of great value when transparent objects are being dealt with. T. N. Armstrong.

WHITE'S IMPROVEMENTS IN APPARATUS FOR PRODUCING AND EXHIBITING COLOUR PHOTOGRAPHS.

In what is known as three-colour photographic work, says the patentee, Mr. Walter White, it is usual to make a series of three negatives, either by separate exposures in an ordinary camera, or by simultaneous exposures with one objective in a special camera, each negative being produced by light rays of a certain colour acting through a coloured screen or light filter upon a suitably sensitised plate. Such a series of negatives constitutes a complete colour record of the object photographed, and transparencies made from such a series and viewed by superposition of the light passing through them and through appropriate coloured screens show the natural colours of the original; or such a series of three negatives may be used for three-colour printing by photographic or photo-mechanical processes.

By my invention I facilitate the production and viewing of such colour photographs, and I produce improved results by simpler and more convenient means than have hitherto been used.

To produce the three negatives representing the red, green, and blue-violet sensations, I construct and employ a special camera.

In the accompanying drawings

Fig. 1 is a sectional plan of a camera or apparatus for producing negatives in accordance with my invention.

Fig. 2 is a perspective view of the same, with lid raised to show the construction, and indicating the position of the reflectors required to convert the same into a viewing instrument.

Fig. 3 is a plan of a movable mirror stand.

Fig. 4 is a sectional elevation of my camera or apparatus in use as a viewing instrument for horizontal pictures.

Fig. 5 is a sectional plan of the same, arranged as an optical lantern for projecting coloured pictures on a screen.

For the production of negatives my camera is fitted with a lens or objective, A, as for ordinary photography, and consists of a casing or box, B, constructed to carry three sensitive plates, one of which is placed at C, opposite to the lens, in the focal plane; the other two plates are placed at D and E, each at a right angle to the focal plane, parallel to each other, but on opposite sides of the camera. In the camera two transparent or semi-transparent mirrors, F and G, are used as reflectors and transmitters of light, each at an angle of 45° to the focal plane, but at an angle of 90° to each other. The first mirror, F, or that immediately behind the lens, reflects a portion of the light passing through the lens, and forms an image upon a sensitive plate at D, on one side of the camera. The remainder of the light passes through this mirror, F, and a further portion of it is reflected by the second mirror, G, which is at an angle of 90° to the first, and forms an image upon a sensitive plate at E, on the opposite side of the camera. The residue of the light, which passes through this second mirror, G, forms an image upon a third sensitive plate placed at C, at the back or end of the camera, as in ordinary photography. The correct focussing of the images is performed by the backward or forward movement of the lens, A, by means of rackwork, or screw, or other suitable motion, the plates being placed at such distances from the mirrors as ensure the images being in correct focus at the same time upon the surfaces of the three sensitive plates. A lens working at a fixed focus may be employed, either with or without supplementary lenses for objects at different distances.

The mirrors, F and G, are plane transparent or semi-transparent mirrors, and may be of plain or coloured glass, or glass covered with a coloured coating, or glass thinly platinised or silvered.

The colouring of each of the mirrors may be complementary to the colour of the light that acts upon its respective plate. The first mirror, F, or that immediately behind the lens, may be of yellow glass or glass prepared with a yellow coating, the plate used at D being in this instance sensitive principally to blue or violet. Such blue rays as pass into the glass, F, will then be absorbed and not reflected from the rear surface, and therefore no double image will be produced on the sensitive surface at D. For the second mirror, G, I may employ an orange or red glass, or glass prepared with an orange or red coating. Any secondary image that may be reflected from the rear surface of this mirror will contain no green rays to which the second plate at E is sensitive. The third plate at C, at the back or end of camera, specially sensitive to the red and yellow rays, will in such case receive only the red and yellow rays that are allowed to pass through the two mirrors, F and G.

In addition to the two mirrors, F and G, colour screens or light filters may be used in front of the sensitive plates, according to the sensitiveness or colour sensitiveness of the plates. A colour screen may be used behind or in front of the lens.

If silvered or platinised mirrors are used, they may consist of thinly silvered or platinised plain or coloured glass, or glass covered with a coloured coating on one surface, and they may be used either with or without additional colour screens. In any case, the colours of the mirrors and screens must be such as together with the special preparation of the plates will allow only the light representing one of the three-colour sensations to act upon each plate, and to produce properly timed or exposed results upon the three plates with a single exposure, the three plates when developed being negatives, each of which represents one of the three fundamental colour sensations. If negatives are required

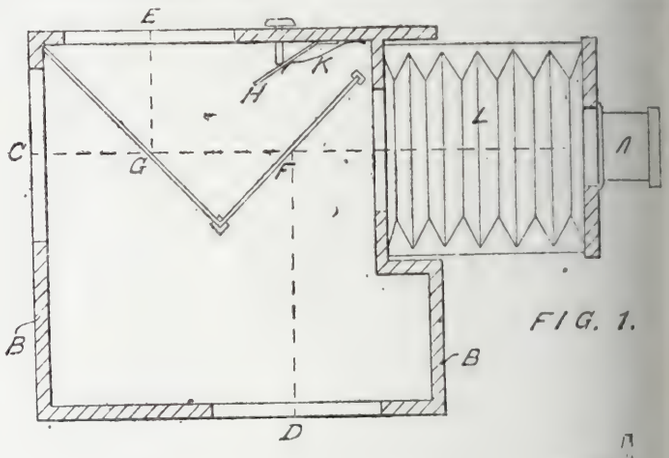


FIG. 1.

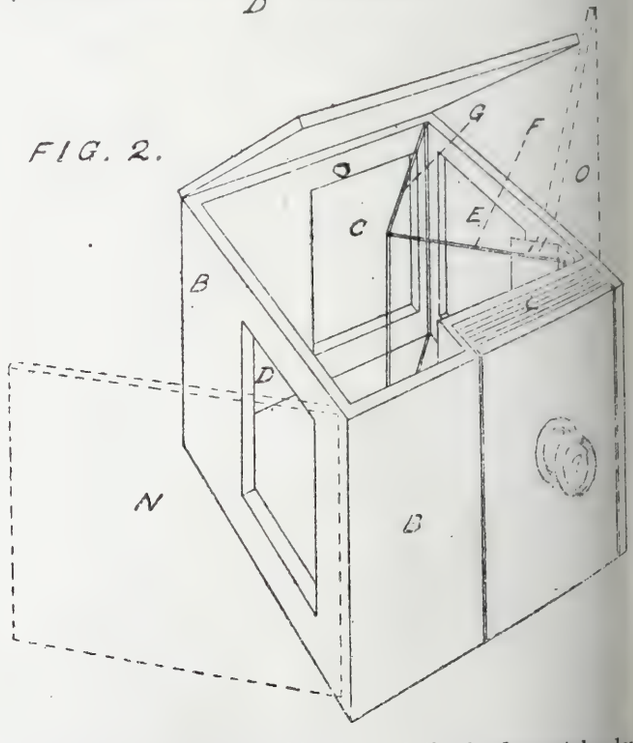


FIG. 2.

representing modifications or combinations of the fundamental colour sensations, they may be obtained by altering the colours of the mirrors or screens, or the preparation of the sensitive plates, or by a combination of such alterations.

An opaque screen or division should be placed in the camera between C and D, to prevent stray light from acting upon the plates.

To cut off any direct light that might act upon the sensitive plate at E I employ an opaque and non-reflecting flap or screen, H, hinged to the side of the camera, and adjusted by a screw, J, passing through to the outside of the camera. The flap or screen is held against and made to follow the movement of the screw, J, by a small spring K.

With some lenses the foci of the different coloured light rays are not identical, so that, to produce in the three required negatives images of equal sharpness, the sensitive plates must be at unequal distances from the lens. These unequal distances may be secured by moving one or more of the plates backwards or forwards parallel to its original position. I improve upon this method by employing in my camera or apparatus a support or stand for each of the mirrors, each support or stand being

movable by rackwork, screw, or other suitable motion, backwards or forwards, from or towards the lens, parallel to its original position, and carrying the mirror at the same angle in relation to the other mirror and the focal plane. Fig. 3 is the plan of a movable mirror stand, adjustable by hand and fixed in position by two screws. By this means each of the mirrors can be moved independently of the other towards or from the lens, thus shortening or lengthening the distance from the lens to the surface of the mirror, and consequently from the lens to the plate, upon which this reflects an image. In conjunction with this, the sensitive plates at the sides of the camera, or the frames or slides carrying these plates, may be made movable sideways in the same plane towards the front or back of the camera; this renders it possible to make the exact centres of the plates correspond.

For utilising the camera as a viewing instrument, I remove the lens, and may replace this by a magnifying eyepiece, M, and I employ two or

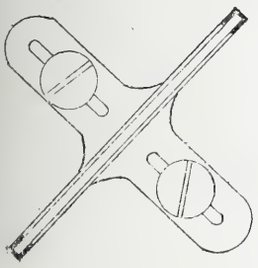
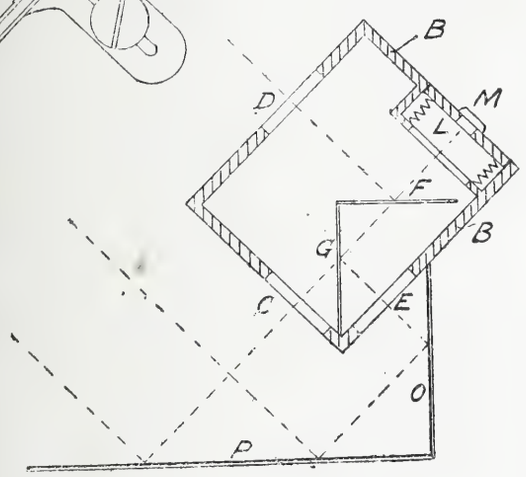


FIG. 3.

FIG. 4



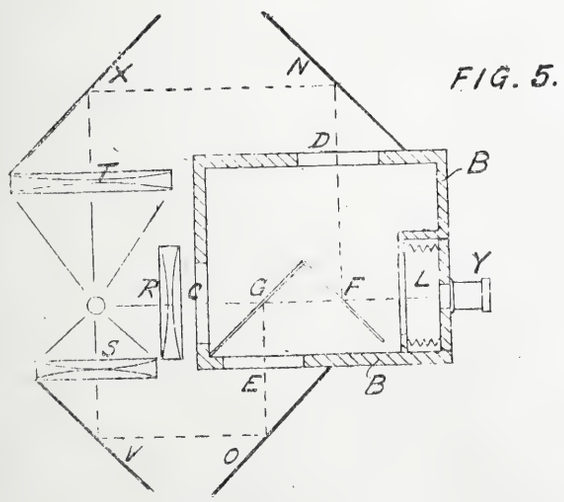


FIG. 5.

more reflectors, N, O, P; or I may use an apparatus similar in construction to such camera, but without a photographic lens or objective, or with a magnifying eyepiece. From the negatives obtained by the camera as before described, I make three transparencies or positive pictures on glass or other transparent material, and, placing them, not inverted, in the camera or viewing apparatus in similar positions to those previously occupied by the sensitive plates at C, D, and E, I am enabled to view them through the front aperture or eyepiece by transmitted and reflected light, and by using coloured screens, or by colouring the transparencies so that the light passing through the transparencies is in each case similar to the light of that colour sensation which the transparency represents, I obtain, by thus viewing them, a combination of the three transparencies of the colour sensations, each in its own colour, and consequently an image in the natural colours of the original.

In using the camera for producing upright photographs, that is, photographs whose height is greater than their width, I employ it in the manner described, that is, with the mirrors, F, G, perpendicular to the horizontal plane, and reflecting two images to opposite sides of the camera, and, viewing the resulting transparencies, I employ the camera or apparatus in the same way with the addition of reflectors, N, O, outside, and at each side of the apparatus, the whole being pointed towards a bright sky, or downwards towards a third reflector. It is obvious that, by turning the camera or apparatus on one side, horizontal photographs may be produced and viewed; in this case, one of the plates or transparencies will be at the top, and one at the bottom of the camera or apparatus. The same arrangement of reflectors for viewing may be used, but if the apparatus is pointed downwards, as in fig. 4, the side reflector, that now becomes the top reflector, may be dispensed with, and direct light from the sky utilised.

The apparatus when used as a viewing instrument may, instead of being pointed downward towards a third reflector, be pointed upwards towards the sky or other suitable source of light, and a third reflector of small size, attached to the outside of the front end of the apparatus at an angle of 45°, reflecting the image upwards to the eye, offers a convenient means of viewing. In this case the transparencies must be inverted when placed in position.

Stereoscopic negatives may be produced in the same way as single negatives by using two lenses and plates of suitable size, the camera being used in the same position as in taking a horizontal view, and the resulting stereoscopic transparencies may be viewed in a similar camera or apparatus fitted with a stereoscopic eyepiece.

The three transparencies may be employed in conjunction with colour screens for projection by a triple optical lantern, or with a single source of light, as in fig. 5, a special lantern may be used containing, in addition to the usual front condenser, R, two condensers, S, T, on opposite sides of the source of light, each having a mirror, V, X, to reflect the light at a right angle. Then, by affixing my camera or apparatus as for viewing, together with a suitable lens, Y, for projection purposes, the light passes directly through the central transparency, and by reflection through the two side transparencies. Instead of affixing a camera or viewing apparatus to an optical lantern of such construction, I may employ a lantern, specially constructed as described for one source of light, the front portion being of such construction as to be similar to my camera or apparatus in its arrangement of transparencies, mirrors, and reflectors.

Coloured lantern slides for ordinary single optical lantern projection may be made by printing in transparent colours such as gelatine dyed either before or after printing or developing, and superimposing these prints in correct register; the negatives representing the green, red, and blue-violet sensations should for this purpose be printed from respectively in pink, cyan-blue, and yellow.

Similarly this principle of colour printing may be applied to the production of printing blocks made from the three negatives, or they may be made to furnish plates for collotype printing, intaglio plates for photogravure printing, or moulds for Woodburytype printing, the three impressions giving in each case, when superimposed, the required tints to accurately reproduce the colours of the original.

GROUND GLASS.

THERE often appear in photographic papers articles on *substitutes* for ground glass, it being little understood, probably, what an exceedingly easy process it is to make the very thing itself; and that starch, arrow-root, and suchlike things are almost, if not, quite as much trouble to utilise (and of not one-tenth the beauty and durability) as ground glass at home.

The following plan may, therefore, be acceptable to some of my brother amateurs:—

Take a clean negative glass of any size, and lay it on a flat, hard surface, such as a board or stone slab, sprinkle on this a pinch of emery powder, No. 1 (flour of emery will *do*, and do well, but the next quality, coarser, works more quickly). Lay on this a piece of broken glass about an inch square or thereabouts, and *moisten* the emery with a little water (do not use much so as to let it get "sloppy," and work all about).

Now, work round and round all over the negative glass with the moderate pressure of two or three fingers until the gritty sound begins to go, which means that your emery is getting ground too fine (this will be in about a minute or two). Put on another pinch of emery, and work as before; in about ten minutes rinse your plate under the tap, and you will find probably with your finely ground surface a few "islands" looking shiny, return the plate to the board, and work these patches out, and you will find a surface ground as finely as any you can buy, and there is no difficulty whatever in getting a perfectly even surface free from any scratches, or defect whatever.

Any ironmonger will supply the emery, a pennyworth by post if you live "beyond the region of lamp-posts," and even the ordinary domestic knife powder will do, but it is too fine and works too slowly, and is inclined to be gritty and make deep scores in the surface of the glass.

If an extra finely ground surface is required as for a focussing glass, it only means rather longer grinding, and perhaps a little flour of emery to finish with; but the whole process can easily be done with one quality of emery, of which the best is probably the No. 1. If the surface of negative glasses were perfectly flat, it would be possible to grind two together, but the surface is never flat, and a small piece of glass is best to grind with. Some samples of glass are harder than others, and take rather longer to finish.

ARTHUR EAST.

MOSELY'S EXPOSURE SCALE.

THE following is the description of this invention:—

In fig. 1, A is the shallow trough, box, or case, ready to receive the material upon which the record is to be made; *b b* are lugs, provided with holes for attaching it, by means of screws or nails, to the apparatus. C is a lid or cover hinged at *d*, shown open, but can be kept normally closed by a spring located in *d*. This is for the purpose of protecting the contents; it can be made of transparent substances, such as glass, mica,

Fig I

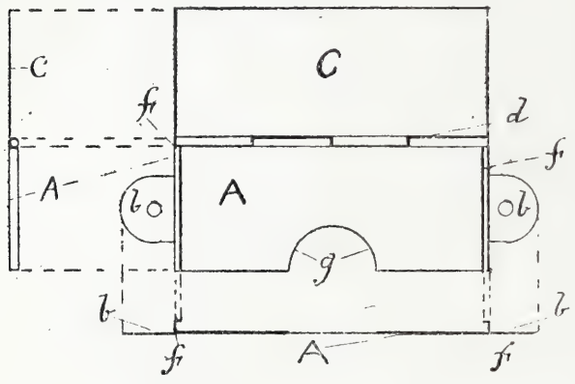
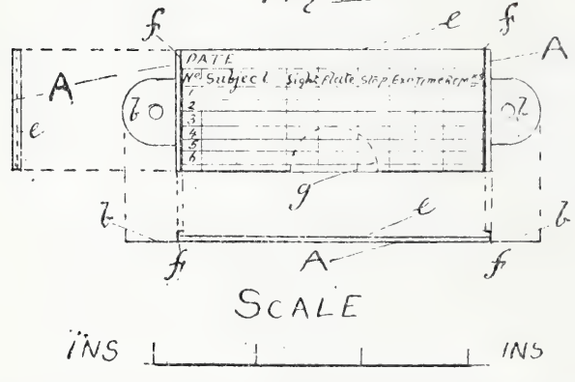


Fig II



SCALE

or celluloid, when the record can be inspected without the necessity of opening it.

In fig. 2 is show the tray, A, the lid, C, being dispensed with; *e* is a strip or layer of the material, ruled ready to receive the record, suitable for use with a photographic camera. It is held in its place by the sides and by its tendency to remain flat, the ends being caught under the curved or channelled ends, *f f*, facilities for removal or fixing being provided by cutting away a portion of the back, as shown at *g g;* this enables it to be easily taken hold of, either for the purpose springing it into or out of position.

THE CAUSE OF THE FORMATION OF THE LATENT IMAGE ON GELATINO-BROMIDE PLATES.

II.

THE crystallisation of amorphous bodies can occur, not only under the influence of light, but also under that of heat and mechanically acting forces, such as friction, percussion, pressure. A good instance of such a transformation is found in the yellow mercuric iodide, easily passing, with disengagement of heat, into the more stable red form.

Examining the influence of the mechanically acting forces, on gelatino-bromide plates in the dark, and observing necessary precautions, I have obtained some interesting results. The experiments were made in the dark, and the plates developed.* It was found that, if we write or draw on the plate with some sharp object in the dark, and then develop the plate, the writing comes out as if the plate were exposed in these places. Evidently the amorphous silver bromide was crystallised by friction. By striking the plate with a hammer the silver bromide is changed, and can be developed in the places struck. In this experiment it is interesting to note that the development takes place, not in the upper elastic layer of the film, but in the lower part nearer to the glass. Therefore the friction and percussion with a hard body can change the silver bromide from the amorphous to the crystalline state. The influence of pressure on gelatino-bromide plates was explained by the experiments of Abney and Carey-Lea. These investigators have found that a strong pressure with a hard body produces a change in the molecular state of silver bromide, the metallic silver being reduced by ordinary developers in the places affected by the pressure.*

The foregoing facts, although not amounting to a complete proof, lend great probability to the supposition, that the formation of the latent image on a plate exposed to light in a photographic apparatus depends on a physical change of the molecule of the amorphous bromide of silver, the change from the amorphous to the crystalline state, the latter possessing the property of being reduced by the developers. This supposition is confirmed by many known facts and observations. It explains also, most satisfactorily, the methods of preparation, and the high sensitiveness of the plates now in use.

As is known, the preparation of the very sensitive plates can be reduced to the following:—The bromide of silver precipitated in the dark and carefully washed is heated, for a time, at a known temperature in a solution of gelatine, and then spread on glass. By heating at a temperature approaching that at which the bromide of silver crystallises, its molecules are brought into a state of strain, similar to that of glass in Rupert's drops, and remain in that state on the plate. A similar strained state of the molecules exists also in the supersaturated solutions. This strained state of the molecules of the bromide of silver on the photographic plate is easily relieved by many forces, the molecules arranging themselves in a crystalline form. Under the action of light, the *stroke of the light wave completes the physical change of the molecule of silver bromide started by heat*, and transforms it into the crystallised variety, which is reduced by developers to metallic silver. It is clear that a longer action of light or its stronger actinism produces a stronger crystallisation, and a greater amount of metallic silver. The crystallisation of silver bromide on the plate explains also the deterioration of plates on keeping. As is known, the plates now in use, on keeping, become, at first, more sensitive than when freshly made, and then sometimes spoil, even under the most favourable circumstances. The spoiling consists in the appearance of fog on the margin of the plates which are kept too long, spreading, with time, towards the centre of the plate, and, in the end, covering the whole surface. This phenomenon is most naturally explained by the strained state of the molecules of silver bromide, leading in time to spontaneous crystallisation, beginning, as a rule, round the edges.

The processes of development of the exposed plates can be divided in two types: chemical and physical. The first process, chemical, now mostly used, consists in the reduction of the exposed silver bromide by some bodies mostly organic, as hydroquinone, pyrogallol, eikonogen, para-amidophenol, and others, usually in weak alkaline solutions. In this process the silver bromide, which has crystallised under the influence of light, is reduced to metallic silver. In the physical process of development the silver bromide, molecularly changed by exposure, is not reduced, but serves only as a substratum for the deposit of metallic silver precipitated from the developing solution. In former times the physical process was largely used for developing collodion plates. The plate was covered with an acid developing solution (usually ferrous sulphate), which, reacting on silver nitrate left on the plate, deposited metallic silver on the more or less exposed places. Direct observation of the plate, before and after exposure, has shown that the smooth surface of the unexposed plate becomes rough under the action of light, and it is on these rough places that the deposit of silver begins, spreading gradually and with sufficiently long development, covering the whole plate. There is nothing exceptional in this phenomenon. It is well known that, in the evolution of gases or separation of solid bodies from solutions, the disengagement begins in those places of the containing vessel which present inequalities of surface or sharp points. The fact is often utilised in chemical practice.

The development of Daguerreotypes is explained as easily and naturally. The smooth homogeneous film of silver iodide, formed in the dark by the action of iodine vapour on the silvered plate, assumes, under the action of light, a crystalline state, which facilitates the deposition of drops of mercury on the exposed parts. Photographic literature gives direct indications of this change of molecular state of silver iodide.†

In support of the foregoing explanation of the physical development, it must be mentioned that a washed collodion plate, free from nitrate of silver, cannot be developed with the acid solution of ferrous sulphate, although there is a latent image on the plate; but, the most convincing argument in favour of my view on the physical process of development is found in the observations of Kogelmann.‡ This investigator has found that a bromide of silver plate, exposed in a camera and fixed without developing, gives an image when treated with a solution, which can deposit metallic silver (ferrous sulphate acidified with acetic acid, with addition of silver nitrate), although there is no silver bromide in the clear and transparent film of gelatine. Kogelmann explains it by the changes in the gelatine produced by light, but that is hardly

* In all cases I worked with fresh plates of A. Lumière et ses fils, and, as developer, used eikonogen, according to Andresen's formula.

* I repeated the experiments with the same results.

† *Schultz-Sellak. Pogendorf's Ann.* 143, p. 439. *Donné. Comptes Rendus*, ix. p. 376.

‡ Die Isolirung der Substanz d. lat. Bild. Graz. 1894. Similar experiments were made by Carey Lea on the iodised collodion plates.—*Photographisches Archiv*, 1866, p. 73.

admissible, as the same experiment succeeds with a collodion plate containing no gelatine. Much more correct and nearer to truth would be the explanation that, during the crystallisation of silver bromide, under the action of light, the microscopic crystals are forced into the gelatine, leaving there their impressions and the silver precipitated from the developing solution deposits on these rough places.

Considering the action of light on the photographic plate as a process of molecular change of the amorphous bromide of silver, resulting in the crystallisation of the compound, we must not lose sight of the influence on the process of other agents. As it is known that many bodies besides the bromide of silver crystallise under the influence of heat, it was to be expected, *à priori*, that the action of light on the bromide of silver plates would be influenced by temperature to a certain extent. Although the question, as far as I know, was never studied systematically, the fragmentary information found in photographic literature puts the existence of such influence beyond all doubt. Joly* in exposing the plates at the temperature of solid carbonic acid, obtained only weak impressions, even after a prolonged exposure. The same is said by polar travellers.† In my own experiments, carried out in winter time at—16°—20°R. I have found that the low temperature retards considerably the formation of the latent image.

On the other hand, every photographer knows that in summer time the images are more brilliant and more rapidly obtained than in winter. As in summer the light is more actinic, it was possible to suppose that the above-mentioned fact depends not so much on temperature as on the greater chemical action of light. To test the question, I have made a series of experiments on plates of the same manufacture. The same object was taken at first on plates heated to 30°—50°C., and immediately afterwards on plates at ordinary temperature. The experiments have shown that, with the same exposure, the image on a heated plate is crisper and stronger. Prolonged heating at a temperature near 50°C. produced fog—an indication that the bromide of silver began to crystallise under the influence of heat. There is no doubt, therefore, that the low temperature hinders, and the high furthers, the formation of the latent image. This fact is in perfect accord with my view of the cause of the latent image.

PROF. G. LAGERMARC.

PHOTOGRAPHING BEAUTY.

II.

In my last article on this subject I said that beauty could be divided into three classes, viz., young children, young women, and old people. Therein I spoke of young women only; I did so because it is the most fruitful field in which to find beauty. Children and old people are more troublesome subjects before the camera, and, in my opinion, not nearly so profitable. I was in error in saying *young* children; I ought not to have used the word, as many readers took such to mean babies.

"For goodness' sake," wrote one correspondent (a bachelor, I presume), do not attempt to turn the good old BRITISH JOURNAL into a nursery journal. I expect you will be calling those little, wriggling masses of humanity 'little lambs,' or something equally bad. Alas! what a preposterous misuse of words. A baby is a kind of lamb that no royal tiger would like to lie down beside if infantile strength were equal to infantile ferocity. Luckily, its flexors and extensors are feeble, and its little jaws unarmed, otherwise there are few animals one would not rather encounter in a rough-and-tumble fight than a human suckling of twelve or eighteen months. Physically, it may be 'sweet,' but, morally, it is a wild, young beast. Observe its treatment of a kitten. How energetically it labours to tear the little feline limb from limb. Or could the hungriest lion of the desert clutch a spring brook with more savageness than 'mother's darling' displays as it fastens its chubby digits in the parental hair or whiskers? The truth is that there is no cub of the wilderness more cruel or relentless in its treatment of 'helpless innocence' than a human baby."

The above, I must confess, is, to a certain extent, very true; but, if a photographer wishes to rise in the world, he must certainly agree with what baby's parents say, and he may perhaps go so far as the poet did and call them "living jewels dropped unstained from heaven." Who can blame a photographer for so doing? Pollok, when speaking of children, once said,—

> "I looked upon their loveliness,
> And sought through nature for similitudes
> Of perfect beauty, innocence, and bliss."

How wonderfully alike are all babies, especially when asleep, in spite of what their devoted parents may say to the contrary! The same rounded, half-formed features; the same gentle, closed eyelids; the same slightly parted mouth are common alike to high and low, to good and bad, before passion or education has begun to draw those harder and more decided lines which sleep cannot obliterate, and which only pass away when once the calm look of death has gone and dust returns to dust. Do such lines mar or alter the face of a sleeping child or give a clue to the daily history of the soul within.

* *Photographisches Wochenblatt*, 1894, No. 31.

† Amongst other facts known to me and relating hereto, I must mention the verbal communication of the well-known student of native life in the far North.—Prof. A. T. Jacoby.

I have been asked to define the ages of the three classes of beauty that I have been bold enough to set out. This, I must own, is a very difficult matter, as the physical development of the human body varies very considerably. Say, for instance, we commence seeking for beauty in a feminine face three years of age, we *may* find beauty at all ages, *i.e.*, all through life; but, on the other hand, all of us know that at certain ages some females are much better-looking than at others. How often we hear it remarked that So-and-So has lost all her beauty, or that So-and-So is growing more beautiful each day. A girl may be "as ugly as sin" at ten years of age, but ere another ten years have elapsed she may be of unsurpassable loveliness, and *vice versâ*. The female alluded to in my previous paper, for instance, was very unbecoming at the age of ten years, but at seventeen she was universally admired. In my humble opinion, genuine beauty is *generally* found to exist in children between the ages of three and seven years; in young women between sixteen to thirty years; in old age from seventy years upwards, even to the time when Shakespeare says "we are well-nigh worn to pieces with age."

Photographs of beautiful children are generally most artistic and satisfactory productions, for beautiful children usually make equally beautiful pictures. One thing is certain, we get with them a more natural expression than with adults; the latter endeavour to assume the expression they desire to have represented in the picture. Few photographers can divert a sitter's mind from the fact that the photograph is being taken, but with a child things are different. The latter knows nothing of expression, has no pride or wish to look its best; hence we get a natural expression, or one of wonderment, which is very becoming to a child, far more so than a look of vanity. Confidence between child and operator is the first element of success. When complete confidence is assured, a child in the hands of a photographer is as easy to handle and model as a piece of lifeless clay. Some operators, however, cannot get along with children, they would as least see a lion enter the studio. Hard must be such hearts, and selfish the minds that are not softened and expanded by communion with sweet infancy. The innocence of childhood is the tenderest, and not the least potent, remonstrance against the vices and errors of grown man, if he would but listen to the lesson and take it to heart.

Pretty children, like their elder sisters, are to be found in out-of-the-way places as well as in the castle. I cannot do better, in this instance, than quote the words of that successful American photographer, Mr. George Rockwood, who says:—

> "It is not only among the more fortune-favoured people that the beautiful types are seen; for, though the careful attention paid to diet and exercise, the exquisite care and the becoming and dainty attire have a tendency to enhance the charms of an ill-favoured child, still genuine beauties are found in the narrow streets and dingy tenements. The average of really beautiful types is said to be greater among foundlings than it would be among an equal number of children taken from more prosperous surroundings, while one of a famous artist's exquisite heads is a reproduction of the face of a little girl in a charity school, and it is not nearly so beautiful as the original. This may be in accord with the theory so often put forth, that children born of nature and out of wedlock are often the most gifted in physical and mental charms. This I cannot discuss. Still every swan thinks her own particular grey cygnet white, and every fond mother points with pride to her own cherub without wings as the typical childish beauty of the day. To me all are comely; if not always in external beauty, there is a sweet simplicity to childhood that wins my heart, and I am free to say that they develop the best efforts of my artistic skill, and I prefer them as a field of effort."

After a child has passed the age of seven years, beauty, as a rule, is not so prevalent. I am fully awake to the fact that there are exceptions, and that there is no standard of beauty. The sculptor who shaped the Medicean Venus thought he had combined all the rarest physical charms of the sex in that world-famed work of art, and yet I have heard it criticised as too short, too tall, too thin, too plump, &c.; and a six-foot-four Vermonter who went to Rome to perfect his artistic ideas recorded, in a visitors' register there, the unsentimental dictum that "the figure was pretty good, what there was of it, but there wasn't more'n half enough;" so that even the statue which, we are told, "enchants the world," is not everybody's paragon.

Leaving the seven-year-old child, we soon arrive at that period of human existence which is termed youth. Mary Howitt, in speaking of it, says:—

> "A child no more! a maiden now,
> A graceful maiden with a gentle brow;
> A cheek tinged lightly, and a dovelike eye,
> And all hearts bless her as she passes by."

What a glorious period of life it is, but it is one that does not reek with facial beauty. How delightful it is to revel in the full flow of Nature's bounteous stream, swelling to expected perfection! To the present feeling of enjoyment and the unbounded anticipation of future bliss how open is youth! How full of delight, and how beauteous in infancy, although, like the early blossom in spring, it feels the chills that its nature is heir to. We press the elastic muscle, full and soft, of the healthful child, and pass our fingers through the glossy curls, and fondly pinch the rosy, dimpled cheek, and gaze into the laughing eyes, and express, with enthusiasm, our admiration of the promise Nature gives of its future perfection—we know not what; but we feel and know that we

love youth even in its immaturity. As it approaches to, and attains, maturity, how admirable, how lovely, is youth in its pristine purity!

From girlhood we get to womanhood, or, strictly speaking, the most beautiful period of womanhood—that coming between the ages of seventeen and thirty years. A connoisseur, writing in the "ladies' column" of one of the leading dailies, says:—

"A woman is supposed to reach the height of her beauty when she attains the age of thirty, in spite of all who think that the first blush of youth and the freshest beauty are then over.

"The vernal beauty of girlhood is, after all, but the suggestion of the greater loveliness to come. No one presumes really to compare the bud with the splendour of the full-blown rose, and no beautiful woman who has lived to be thirty would exchange the sumptuous charms of her youth's glorious fulfilment revealed in the splendours of maturity for the childlike prettiness of her first season. Up to her early thirties, a beautiful woman, moderately careful of her health and toilet, has little or nothing to fear from what we are pleased to call the ravages of Time."

In placing the age limit at about thirty years, another difficulty presents itself, for there are many beautiful women at thirty-five, forty, or even fifty years of age. A prominent member of society is often classed among the latter—I say "often," because it is by those people who have seen photographs of her from "double-worked" negatives, and not those who have had the opportunity of gazing into the face of the original. Who is there more entitled to good work and flattery than those in high life? An eminent retoucher once told me that he was obliged to refuse the work of a certain firm of "Royal photographers" because of the enormous amount of work they wanted on the negatives. There were, of course, financial as well as conscientious motives in such an act, for they refused to pay a reasonable price, not even so much as a "small man," who wants very little done to his negatives.

There are few British matrons between the ages of thirty and seventy years that are really beautiful without a lot of "faking," and the same do a photographer a great deal of credit; but such specimens are, I fear, almost as scarce as the great auk's egg. RICHARD PENLAKE.

Our Editorial Table.

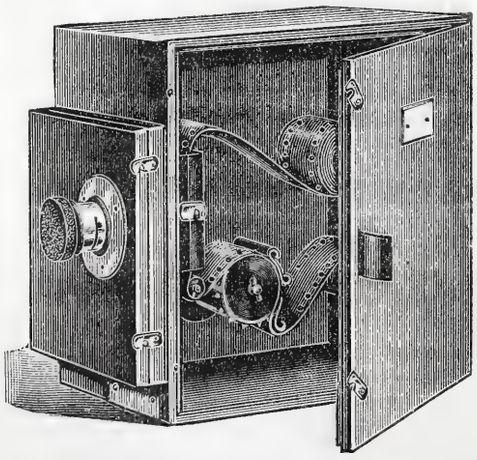
CATALOGUE RECEIVED.

MR. JONATHAN FALLOWFIELD, of 146, Charing Cross-road, W. C., sends us his special spring novelty list. Hand cameras in great variety, and of the latest types, and many other items of recently introduced apparatus are figured in this list. Mr. Fallowfield also forwards his job catalogue (stock-taking sale), wherein we find listed nearly 1300 bargains of all kinds.

THE MOTO-PHOTOGRAPH.

The Moto-Photograph Supply Co., 3, Brushfield-street, Bishopsgate, E.C.

THIS, one of the latest instruments devised for taking animated photographs, has been shown to us. It is very small and compact, and, besides being used as a camera, answers also, with a little adaptation, for either projecting the positives or printing from the negatives in



contact. The essential movement, that for passing the film behind the lens, appears to be simple, novel, and effective, and a brief trial of the machine as well as an inspection of the results convinces us that the instrument is a thoroughly good one—it is comparatively noiseless, does not tear the film, and in size is not much larger than many hand cameras. Moreover, it is extremely well made and finished, and is cheap. An adjustable focal plane shutter is fitted to the camera, admitting of exposures ranging from the tenth to the 1500th of a second.

L'ART DANS LES PROJECTIONS.

By F. DILLAYE

Paris: L. Gaumont & Co., 57, Rue St. Roch.

MONSIEUR FRÉDÉRIC DILLAYE, a cultivated writer and a clever photographer, is justly looked up to in France as probably the highest authority there on what we must, for convenience sake, term art photography. The work before us, which is illustrated by fifty-five collotypes from the author's own photographs, brings the principles of art to bear on the production of lantern slides, what to avoid and what to attempt being equally well and fully pointed out. The subject is treated with great skill and knowledge, and we should like to see the book translated into English. One or two clever English photographers have denied that lantern slides have any pictorial qualities, and therefore M. Dillaye's able treatise should have a special value to those who are unaware of the great possibilities of projected images as vehicles of pictorial expression. The collotypes printed in the text are capitally done.

News and Notes.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, April 21, at eight o'clock. *Reminiscences of American Photography*, by Mr. George Hana.

MESSRS. L. TRAPP & CO., of 1, Budge-row, Cannon-street, London, E.C., write: "Kindly take note that our offices and warehouse will be closed from Thursday evening, the 15th inst., till Tuesday morning, April 20."

IN a memoir presented to the Paris Academy of Sciences by MM. G. Claude and A. Hess on a *New Method of Storing Acetylene*, the authors state that acetone is a good solvent for acetylene, one kilogramme dissolving 300 litres of acetylene under a pressure of twelve atmospheres.

HIS LURE FOR LANDLADIES.—At the Essex Quarter Sessions on Wednesday, April 7, before Lord Rookwood, Thomas Winder, a baker, pleaded guilty to obtaining board and lodgings by false pretences at Harlow. It was stated that the prisoner was wanted for similar offences all over the country. He obtained lodgings by representing that he was a Government milk-tester, and he had a *penchant* for taking photographs, including those of his different landladies. He was sentenced to six months' hard labour.

JUDGMENT was recently given in the Cinematographe case by his Honour Sir Horatio Lloyd at the Chester County Court. The action was one brought by Mr. James Carter, proprietor and lessee of the local Royalty Theatre, to recover 15*l.* as damages for breach of agreement from Messrs. Maurice Edward Bandmann and Robert Malcolm Wallace, who had the provincial rights in a cinematographe, which was shown during the pantomime of *Dick Whittington* at the Royalty. His Honour, in giving judgment, said the action was one to recover damages for a breach of an agreement, under which the defendants agreed to supply a first-class entertainment, to provide a first-class machine, and to supply no fewer than twelve high-class pictures at each of eight performances. He would not resist the conclusion that the exhibition was not a satisfactory one. Mr. Carter was entitled to some reasonable damages to show that he had done his best to provide a proper entertainment, and that it was no fault of his if he had not done so. He should assess the damages at 5*l.* 5*s.* with costs. Notice of appeal was given by Mr. Moss.

THE PROTECTION OF HAMPSTEAD HEATH.—Many of our London readers will be interested in knowing that Hampstead has of late been unhappy in consequence of the so-called improvements made on the heath by the London County Council, and now a Society has been formed for the purpose of "protecting the heath, preserving its wild and natural beauties, and of remonstrating against any attempts to turn it into a park." Thanks to Miss Emily Field, a large meeting of Hampstead residents has been held at the Drill-hall, Heath-street, and among those who expressed sympathy with its objects were the Bishop of Exeter, Lord Balvaird, Sir W. Besant, Sir R. Hunter, and several metropolitan M.P.'s. Mr. E. Brodie Hoare, M.P. presided, and said that everybody loved Hampstead Heath. It was under the charge of the London County Council, a body which employed guardians to watch over the heath and sundry gardeners to do work thereon. There was a strong feeling against the gardeners. They were men of estimable character, who conscientiously earned their wages by levelling, planting, filling up, and other things, which the residents did not wish them to do. The Society, of which the Duke of Westminster was patron, was in no way hostile to the L.C.C. He, personally, wanted as little as possible done to the heath. The wild heath-like character should be preserved. They did not want a park, they did not want a garden; they had the heath, and they wanted it kept as such. On the motion of Mr. E. Lake, seconded by Mr. J. Hardcastle, a resolution forming a Hampstead Heath Protection Society, with Mr. E. B. Hoare, M.P., as President, was carried.

A STRANGE COINCIDENCE.—Mr. Landy, the well-known Cincinnati photographer, relates, says *The Ohio Underwriter*, a peculiar coincidence which curred some years ago, and which will, doubtless, be read with interest by ljusters and insurance men. He says that some time ago an insurance man as in his office, and that the conversation turned on strange and unusual uses of fires. Many an innocent man, he believed, had suffered unjust spicion and punishment for fires which had not been caused by him. He ted as an instance the case of a fire which had occurred a short time previously, burning down one of the finest residences in Cincinnati, and the cause which was at first the subject of much speculation, but which was afterards found to have been caused in a very novel manner. For several months evious to the fire the house had not been occupied, the owner and his family ving gone on a trip to Europe, so it seemed the fire could not have been arted except by an incendiary. After a long time the insurance companies id authorities came to the conclusion that the fire had been caused by the sun riking a reading glass, which was known to have been placed near a window, and, focussing the heat, setting fire to a newspaper lying under it, and from there mmunicating to the rest of the building. Mr. Landy was relating this to his iend, who, while interested, appeared incredulous, and Mr. Landy, to illusate to him how the fire must have been started, drew him towards the front the office, where a graphoscope was standing facing the window, with a lifeze portrait of President Hayes directly behind it. He started to adjust the strument so as to make the illustration, and was just saying, "Here is how —" when he saw to his wonder and astonishment that the very case he had en describing was being duplicated in his own gallery. The picture was ready scorched and burning slowly, and, as he started to remove it, the fire rst into a flame. It was quickly subdued, and an examination showed that e focussing power of the glass in the graphoscope had indeed acted as in a rning glass, and had set fire to the picture. Mr. Landy still has the half-rnt picture stored away, and offered to produce it for reproduction with this count.

WE have heard a great deal about the kinetoscope and what it is to do for in *re* Corbett and Fitzsimmons and their fight at Carson City. I wonder at some of the ingenious gentlemen concerned in running this show did not opt my old suggestion and go one better than the animated picturing. Why t combine that with the phonograph, and, while presenting the men's tions, postures, and all the rest, let us benefit by the running criticism und to be let loose as accompaniment to the living punching machines' erations? The two inventions ought surely to be worked together. Is it ssible that the Senate really has tabooed the kinetoscopic presentment of the tz-Corbett duel by passing a special act prohibiting exhibition of such ctric photographs? That does seem to be playing it low down on the prosionals. The order by Act is equally hard on winner and loser, who were share profits equally out of the entertainment. If the electric new process ctures are forbidden to be worked over there, I hope the Yankee's loss will eedily be our gain, and the Carson set-to be brought to our own doors. If I ew the plates, or what corresponds to those, were all right, I only wish I uld buy the Colonial concession. Wouldn't I have companies out running em in all the up-country places! Fitz, also Corbett, with two shows a day, free list (except to the press and the police, both always marked dangerous), d no money returned at the doors; ladies admitted. Not that I want to courage the machines, you know, because I do not. If we can carry the stem out to perfection, the present lazy generation will never go anywhere, cept perhaps on the mile a minute minimum pace cycle, and then their ly exertion on it will be to keep it slow enough. They will sit at home at se as gentlemen of England, and, instead of paying gate, just take their ort as they might a meal or a drink. Why, bless my soul, with the constant-rvice sport fixture supply laid on like the telephone, you might lie in bed all e year round and never miss an item worth notice. You telephone to the partment to be switched on to the 'Varsity boat-race, or the final tie of the sociation Cup, or the Oxford and Cambridge Sports, or a big fight like rbett and Fitzsimmons', or what you will, and there you are, or there it is, your service.—*The Referee.*

MELVILLE *v.* HULTON.—Judgment.—Mr. Justice Collins, in delivering judgent in this case, which was tried before him without a jury at the last Liverpool sizes, said the action was brought by Mr. Melville, a photographer, of anchester, against the proprietor of the *Sporting Chronicle*, Manchester, to cover damages for an alleged infringement of copyright and for an injunon. Plaintiff said he owned the copyright in the photograph of Mr. Bacon, athlete, and, as the defendant had published a copy of the photograph in s journal, he was entitled to damages at the rate of 10*l.* for every copy of the per in which his copyright had been infringed. There was no doubt that e plaintiff took a photograph of Mr. Bacon, who was a distinguished hlete, and that a copy of the photograph appeared in the defendant's paper. he plaintiff's chief grievance was that, under the presentment of Mr. Bacon the defendant's paper, there was not added his name as being the otographer who had executed the original work. The question in the se was whether the plaintiff was the owner of the copyright, or ether the photograph was taken for any other person for good and valuable nsideration so as to divest the plaintiff of the copyright in it. On this point ere was a direct conflict of testimony. The plaintiff did not claim that any ntract was expressly made with reference to the photograph in question, but said the photograph was taken by an arrangement between him and Mr. con on the same terms as a former photograph, which was expressly taken the terms that the copyright should belong to him. Mr. Bacon was called, d he must say he was very much impressed with the frank, clear way in nich the witness gave his evidence. Mr. Bacon denied that he ever bargained ay the copyright in his picture, and he absolutely denied that there was any ch contract between him and the plaintiff as had been suggested. He held, erefore, that the photograph was taken for Mr. Bacon at his instance, and at abundant consideration was given for it, and gave judgment for the fendant, with costs.

DEATH OF MR. CLARENCE E. FRY.—We are sorry to learn that Mr. arence E. Fry, the well-known photographer, formerly of the firm of Elliott Fry, died suddenly on Saturday, April 10. Mr. Fry was widely esteemed.

Patent News.

THE following applications for Patents were made between April 1 and April 7, 1897:—

EMBOSSED PHOTOGRAPHS.—No. 8054. "An Improved Method of, and Devices for, Producing Embossed or Bas-relief Photographs." Complete specification. A. MARTIN.

CONVERTIBLE HAND CAMERA.—No. 8328. "Case to Convert Quarter-plate Stand Camera into Hand Camera." F. WARD.

FRAMES.—No. 8334. "A Reversible Strut Back for Photograph Frames and the like." W. C. STEPHEN.

MAGAZINE CAMERA.—No. 8435. "An Improved Magazine Camera." F. GREEN and J. H. LAKE.

SCREEN KINETOSCOPY.—No. 8566. "Improvements in, or additions to, Apparatus for the Production of Living Pictures or Animated Photography." C. A. LEE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
19.....	Southland	Bush Scenery.
19.....	Stafford Y.M.C.A.	Easter Monday Excursion.
20	Aston	Excursion: Bewdley. Leader, George Priddin.
20.....	Hackney	*A Few Remarks on Toning.* W. A. Henaler.
20.....	Lewisham	*Enlarging.* John A Hodges, F.R.P.S.
20.....	Munster	Opening of Annual Exhibition.
20.....	Newcastle-on-Tyne...	Prize Slides.
21.....	Croydon Camera Club	Conversational Meeting.
21.....	Leeds Camera Club.....	Social Evening.
21.....	Leytonstone	*Recollections of a Camera Fiend.* T. Symmons.
21.....	Photographic Club	*Reminiscences of American Photography.* George Hana.
22.....	Ashton-under-Lyne.....	Meetings to receive Suggestions of Places of Interest for Rambles.
22.....	Aston	*The Making of Lantern Slides.* Dr. Hill Norris.
22.....	Bradford Camera Club	*Development.* W. W. Abbott.
22.....	Camera Club	*Peeps into Nature's Secrets.* R. Kearton.
22.....	Ireland	*My First Visit to Saxony and the Tyrol.* Frederick T. Eason.—Lantern Views. George M. Roche.
22.....	London and Provincial	Show of Animated Photographs. Birt Acres.—Lantern-slide Competition.
22.....	Putney	*Notes on Perspective and Composition as Applied to Landscape.* W. R. Stretton.
22.....	West Surrey	*Intensification.* G. H. Seward.
22.....	Woolwich Photo. Society	*The Camera in Cornwall.* J. Borthwick Panting.
23..	Bromley	Prize Lantern Slides.
23.....	Croydon Microscopical	Demonstration on Uranotype Paper. A. Hill.
23.....	Munster	Annual Exhibition of Lantern Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 8,—Mr. Philip Everitt in the chair.

Mr. H. Milner, who had promised to give a paper, was unfortunately not present.

Mr. E. H. BAYSTON raised an interesting discussion in which several theories were advanced upon the question of a well-defined, clear glass line running round the outline of some buildings in a negative which had been lent to him by a friend for the purpose of seeking an explanation. The line appeared where the buildings cut the sky, and was very regular throughout its length. He also showed a print of another subject, in which a somewhat similar effect was seen.

The CHAIRMAN, after a cursory examination of the negative, observed that, knowing nothing of the conditions under which it was developed, it was difficult to say with any degree of certainty what might be the cause. He thought he had met with it in stand development, and suggested that, where extreme contrasts met, one got a kind of attraction of the silver, causing it to aggregate on the high lights and robbing the shadows. It had all the appearance of a robbing process.

Mr. BANKS likewise thought this was the case.

The CHAIRMAN, continuing, said it might be that the bromine liberated from the high lights had a restraining action upon the adjacent shadows. It was only observable against the sky in which there was most reduction going on.

Mr. BAYSTON undertook to try and learn the conditions under which the negative was developed—as to temperature, quantity of restrainer, &c.

A letter from the Société Photographique de la Haute Saone was read, inviting entries for an international competitive exhibition at Vesoul, on June 27 next. Nine classes are announced, and numerous awards are offered.

Mr. KELLOW passed round his results upon the sample pieces of Novitas stripping paper distributed at the recent demonstration. He found that very strong negatives were necessary for the production of slides by this transfer method.

Mr. HILL had done work on similar paper two years ago, and showed a transparency produced at that date.

The CHAIRMAN made some remarks upon the situation created by the coalition amongst certain of the plate-manufacturers, which has recently

assumed definite shape, and which proposes to impose upon the dealers conditions fixing the prices to be charged upon their goods. He thought the question was one of considerable interest to photographers.

In the course of the discussion, some sharp differences of opinion were disclosed, both as to who was the best friend of photographers—the dealer who sold at list prices, or large firms and stores with a big stock and large demand, who sold at a discount of one or two pence in the shilling, and whether or not professionals were deserving of increased discounts over amateurs. This brought up the point as to where the line was to be drawn as between professional and amateur.

Mr. H. C. RAPSON seemed to side with professionals being favoured. In every trade other than photographic, professional men always received special treatment. Professionals were more likely to continue using a thing, and should be worth a little consideration.

The CHAIRMAN repeated Mr. Bergheim's reason for suggesting that the amateur was the real professional and the professional the amateur, in that many professionals only studied photography up to a certain point, sufficient to make money out of it, considering it profitless to go any further than was absolutely necessary.

The HON. SECRETARY called special attention to the fact that Mr. Birt Acres would give a show of animated photographs on Thursday, April 22, the night of the lantern-slide competition for the Henderson award.

Camera Club.—April 1.—Mr. T. L. PORTER, M.A., President of the Photographic Society of Eton College, gave an address upon

MOUNTAIN AND WEST-COAST SCENERY AT HOME AND ABROAD,

illustrated by lantern pictures. Mr. Charters White occupied the chair, and made the announcement that that day was the ninety-sixth birthday of Mr. H. Perigal, who he hoped would soon again be attending photographic and scientific meetings, where for so long he has been a welcome and conspicuous figure. The Club sent him their best wishes. The lecturer dealt with a variety of interesting topics, and referred to his solar spectrum work as that which led him to take up photography. He also gave an interesting explanation of the great atmospheric shadow of the Peak of Teneriffe. The height of the shadow was probably eight miles, and the distance of the horizon 137 miles. He had found that the horizon was curved and not straight. Photographs of mountain clouds, of Etna at morning, noon, and night, and scenery in Ireland, Wales, Norway, and the Lofoden Islands were shown. Concerning some chemically coloured slides, Mr. Porter stated that the red and brown slides were made in the ordinary way by restrained development; but, as regards the blue-tinted ones, he did not feel at liberty just yet to explain the means adopted to produce the colour. A hearty vote of thanks was accorded the lecturer.

Croydon Microscopical and Natural History Club (Photographic Section).—One of the most interesting and pleasantly delivered discourses it has ever fallen to our lot to hear was that by Mr. W. MARRIOTT, F.R.Met.S., on Friday evening, before the members of this Club. The subject was

PHOTOGRAPHING METEOROLOGICAL PHENOMENA,

and it was illustrated by about eighty lantern slides. Mr. Marriott took for the first division of his subject "Clouds," and showed on the screen the various forms of clouds. Some of these were taken at different heights, and some taken at the Sydney Observatory, showing the mackerel sky and baggy clouds, were very good. One slide was particularly interesting, as showing some clouds taken by reflection from the surface of a lake (Geneva), none of which were visible in the sky to the naked eye. This led to the adoption of a mirror, and ultimately of a black glass mirror, which only gave a single reflection from its surface. This was set in front of the lens at the polarising angle, about 45°, which got rid of the light from the blue sky, and therefore enabled the photographer to obtain pictures of the higher cirrus, and other delicate forms of cloud, which were perfectly invisible to the eye. Moreover, by a rotary movement, but always keeping the mirror at the same angle relative to the lens, clouds in almost any part of the sky could thus be brought before the lens. For ascertaining the height of clouds, a camera is attached to a theodolite, and two instantaneous photographs of some particular point in a cloud are taken from two stations in telephonic communication at as great a length of base line as possible. By this means some of the cirrus clouds have been ascertained to be about seventeen miles high. The next division was "Lightning," and numerous slides of this were thrown on the screen. It was proved that the old idea of zigzag flashes was erroneous, and that in all cases the path of the flash was progressive and wavy. One curious slide showed three flashes in parallel paths, which Mr. Marriott explained as being three separate flashes following practically the same path, the camera (a hand one) having slightly moved during the exposure. He recommended photographers to have a fixed and a hand camera exposed at the same time. In order to test this and, at present, other disputed points, some slides were shown having dark flashes. This was explained to be caused by the reversal of the brighter flashes. Some curious and interesting slides were shown of the effect of lightning on trees, cattle, human beings, and the clothes worn by them. The next division was "Wind," and one slide showed what might be thought an unexpected result, *i.e.*, a house in which the roof and walls had fallen outwards. This Mr. Marriott explained as the effect of a tornado or cyclone, in which the house had found itself in the vortex of the storm, where, in consequence of a partial vacuum being formed, the air inside the house expanded and forced out the walls. Two slides showing the curved front of a tornado cloud were put on the screen, as also two illustrating waterspouts at sea, and some of the slides showing breaking waves were very good. The last division was "Frost," and slides were shown of the great frost on the Thames only a few years ago. Some slides of frozen waterfalls were perfection in gradation and technique, the semi-transparency of the ice being perfectly rendered. Frost figures on window panes, than which nothing are more beautiful or evanescent, and some actual photos, showing the characteristic six pointed crystal of snow flakes were shown. Photos of hailstones, showing their mode of formation by successive accretions, in concentric layers round a central nucleus, together with the damage done to buildings, glass houses, windows, &c., by these missile were also shown. Altogether it is apparent that there is a vast amount o good and useful work to be done by the camera in connexion with meteorological phenomena. The President (Dr. Hobson), who occupied the chair called the attention of photographers to the importance of registering th effects so well described by Mr. Marriott; and Mr. Baldwin Latham, C.E. said that, inasmuch as the rainfall returns issued by the meteorological sectio of the Club were the largest and most extensive in the kingdom, he though the Croydon Corporation ought to come forward and assist in this goo work in the shape of funds. The President brought the meeting to close by proposing a vote of thanks to Mr. Marriott for his valuable paper, an also to Mr. Alfred Underhill, who presided at the lantern.

Sheffield Photographic Society.—April 6.—Annual musical evening an exhibition of members' work.—The President (Mr. George Tomlinson) occu pied the chair.—The first part of the programme consisted of vocal an instrumental music, and a select set of slides from a prize series, and th slides exhibited in the second portion were made by members of th Society. A large number of framed and unframed photographs adorne the walls, and temporary screens, which had been erected, many of them being really artistic and of very high standard, proved a great attractio to the large audience assembled. The following artistes contribute to the musical portion of the entertainmnet:—Mrs. Charge, Master Eddi Lowe, Miss J. Armitage, T. Woodworth, and C. H. Starr. Mr. J. A. Rodger was an able accompanist, and also gave two humorous songs. The lantern was under the able manipulation of Mr. J. H. Lygo, and the description o the slides was undertaken by Mr. D. C. Brooks.

Wolverhampton Photographic Society.—At a well-attended meeting o the Society, on April 6, there was a lecture and lantern slides entitled

POMONA REVISITED,

the lantern slides being the work of Messrs. Taylor and Deans, two prominent members of the Society. The lecture was delivered by Mr. Taylor. The slides were made from snap-shots taken on trips round the north o Scotland, and consisted of land and sea views of many notable places and objects, including Oban, Stornoway, Stromness, Aberdeen, Dundee, Edinburgh, and Balmoral. An excellent portrait of Her Majesty was shown by permission of the photographer, Mr. Russell. There were several views of the Forth Bridge. Some features of the granite city were noticed, one being the public statues, which were unfenced by the too common forbidding iron railings. The lecture and slides appeared to absorb the attention of the audience to the close.

Edinburgh Photographic Society.—April 7, Mr. F. P. Moffat in the chair.—Mr. HIPPOLYTE J. BLANC, R.S.A., delivered a lecture on

PHOTOGRAPHY AS AN AID TO THE ARCHITECT.

Mr. BLANC explained that there had been a considerable change in the style of British architecture during the last fifty years. It was evident that some special influence had been at work. This influence had been the camera. With the help of the steam engine and the camera, examples of architecture had been brought from all parts of the world, and, by the study of the photographs produced, the architect received suggestions for new ideas. No apology was required for this study of the architecture of the past; he who studied the past more truly was best fitted for the work of the present. When a building was in course of erection, photographs taken from time to time were very helpful, as the details could thus be studied while the work was in progress, and alterations or additions made as desired. The camera, as a means of education, was very valuable, as, by its aid, the best examples of architecture could be shown to the profession. Mr. BLANC caused some amusement by showing a heavy and cumbersome camera which he had used as far back as 1865. The lecture was profusely illustrated by lantern slides.

FORTHCOMING EXHIBITIONS.

1897.

April 16–May 1 .....*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.

,, 19 ..... Beverley Photographic and Sketching Society. Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"ENLARGING FOR THE TRADE."

To the EDITORS.

GENTLEMEN,—As your valuable columns seem to be always open to vindicate justice and the honour of honest and upright tradesmen, I venture to ask a word of comment from your able pen on the following:—

Some time ago, the person whose name I shall disclose if necessary, representing himself as manager of a syndicate, applied to me for a trial order (enlargement in black and white), stating they would send a specimen of their work "carriage paid." Feeling inclined to test the genuineness of this offer, I wrote for a specimen, which I received with a long apology for its *inferiority*, stating "it was enlarged from a midget and strained up to seven inch head," and stating further, "You will agree with us that it should hardly have been used for a specimen!" Nothing was ever said more in accordance with my views; the fact is, I was ashamed to let anyone see it in my studio, I therefore put it for the time being out of sight;

owever, in consequence of the following clause in their letter, "Should ou favour us with your esteemed orders, we can promise you an im-rovement upon the one sent," I decided to follow the matter up as a st, and sent a negative of two figures (copied from an old card), stating, they cared to execute that order on approbation and I found it satis-ctory, it would "lead," as they desired, to further business. The reply this was, "We have so much confidence in our usual work and finish at we are perfectly willing to execute your order on conditions named you;" but following this comes the most amusing part of all, viz., notations from other first-class firms' price-lists, which was three times igher than the price they asked, following that up again with, "We n assure you that, should you favour us with your orders, our work ill, in *every case* be all that we claim for it; *there is not another house nywhere approaching us!*" This confirmed my suspicions. In a few days received another communication, "guaranteeing that the work should e executed equal to any house in the trade, no matter how high may be eir reputation;" but by this time their price had gone up "considerable!" the Yankee would say; at any rate, I again agreed to pay the last and igher quotation if work was satisfactory.

Exactly a week after, I received another apology for delay together with e following, "We cannot, in all justice to ourselves, accept your order, , should it not quite come up to your preconceived ideal, you have the wer to throw it back upon our hands." Then follows a reference to the ice which they had first of all fixed themselves, then advanced, and timately accepted by me; in this strange epistle they asked for the return of their specimen at my earliest convenience." I asked for the turn of my negative before complying with the latter request. Then is firm or "syndicate," as they choose to style themselves, sent me invoice for the worthless specimen! I, of course, returned the ecimen on reception of my negative; but this morning I received long rambling letter, ending with a threat to work this neighbourhood opposition.

Now, sir, I think you will agree with me that such conduct should be blished, and this is my only reason for asking you to give this matter ur attention and a word or two of warning to the profession.—I am, urs, &c.,

THOS. MILLS.

The North Wales Art Studio, Bangor, N. Wales.

THE POSITION OF PROFESSIONAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I have had correspondence from several provincia otographers recently as to the position and prospects of our profession iefly regarding London. In replying, your issue of this week' URNAL aids me in a coincident and wonderful way. First, the ever sh-and-helpful Digressions, as H. P. R. is pleased to call hi Fashions in Photography." It would take much space to quot ragraphs in full, but read the following, beginning with "It is th ofessional photographer who has the chronic complaint," &c.; then ain, "There is one anomaly I always find difficult to understand,' . In fact, to the photographer who cares to read between the lines e whole article is refreshing and full of instruction.

Then, your paragraph in Ex Cathedrâ column sounds a warning to ose who think, by giving a carbon portrait on linen and a dozen binets for a nominal sum, they are going to found a permanent siness.

The one in question is not the first which has had to go upstairs and n't be the last. Legitimate business on lines suggested by Mr. binson will pay best in the long run. The equally valuable letter m Mr. Turner—bold and outspoken—hits the nail on the head, and ght to lead to some practical remedy. As an illustration of the ting allusion, I give a copy of a stereotyped form of letter shown me a country photographer:—

"TO THE HEAD MASTER.

"SIR,—Our operator is coming to ——— during the coming week to some important work. We thought it a good opportunity to ask you to ow him to photograph a group of masters, also of students, for which we ke *no charge;* and when you are next in town, if you will call at our studios, will give you a free sitting," &c.

In this case the permit was given and the groups taken, and the local n lost what had hitherto been a yearly income. The work was not peated, and my friend the following year resumed the work at a much ver rate.

The leading paper and plate-makers have again signed a compact, and de rules for the guidance of dealers *re* discounts to professionals and ateurs and I wish them success. On the same lines leading photo-phers ought to adopt uniform methods of dealing. Among high-class ns an unwritten law ought to be sufficient; not being so, perhaps ters after Mr. Turner's pointing out the degradation to which a once-pectable profession is being brought might, in a measure, stem the vnward course to which everything photographic is tending.

In a recent letter in the JOURNAL Mr. Frank Sutcliffe said in effect d I sympathise with him) he longed to see a firm start up doing high-ss work with corresponding high prices, and thus let the public see t photography could be done which the author dared charge for, and preciative sitters were compelled and ever willing to pay.

A wholesome lesson was taught in a recent newspaper report of a meeting of Shareholders of Chemists' Stores Company, Limited, who, having a number of businesses in London, sell drugs at unremunerative prices. According to the report, the affair had not been a success, and this must be the case; cheap, and shall I say nasty, must always be associated with failure. Loss of self-respect and self-value you may throw in.

A lady complained, in my hearing, to my assistant that I had charged in excess for photographing her dog. I asked her if she knew what she was paying for, and had to explain that it was not simply for half a dozen cabinets, but for forty years' experience. I may say since that time she has been one of my best clients.

I hail Lafayette's advent to London. He means to do high-class work, and be paid its value; no touting, no complimentary sittings. I was one of the eleven who entertained him at a banquet, when with no uncertain voice he informed us on what lines he was going to conduct his business, and that he was determined to maintain prices equivalent to the work. It is time some one took a stand; if not too late, I hope his example will lure many firms back to a fairer conduct of business, and that the time may come again when the public will reasonably see that a photographer who gives them what they ask for has a right to be paid for his skill, experience, and invested capital; and also rent, taxes, and wages.

My friend Mr. Shaw has taken up the subject from another point of view. I agree and I differ with him. He may be too conservative—better a spirit of compromise, like the rest he finds a demand for novelty. It is asked for and expected; even from the unique example of photographs he so cleverly satirises, he may evolve something; his method may vary, but he must not despise the source of his inspiration. I knew Mrs. Cameron, and remember her pictures as they came out. She was an enthusiast and took infinite pains. She was assisted in having classic sitters, and, like Rejlander, who worked on similar lines, she ignored ordinary mortals as sitters.

We will leave Carlyle and Watts to settle the merits of her work; and I would ask Mr. Shaw to study the originals from which the process blocks were taken and other similar photographs, and, if he does not originate something new to place before his sitters, I am wrong in the opinion I have always held of his sagacity as an artist and business man. I am no friend to sharp focussing and retouching—it has had its day, why not try something else without going to an extreme? I trust, Mr. Editor, you will encourage correspondence in continuation of Mr. Turner's, and may much good come out of it.—I am, yours, &c.,

9 *and* 10, *Baker-street, W.* THOMAS FALL.

STUDIO BUILDING.

To the EDITORS.

GENTLEMEN,—On April 2 you have a few notes on studio building, and make use of this query: Where is the photographer who has not been troubled with a leaky studio roof? I can truthfully say, here, at the Borough Studio, York Row, Wisbech, Cambs. I built the studio four years ago, it has not had a drop of water through the roof, and what is more, I can say that in twenty years hence, and twenty years at the end of that, it will not leak. It has not one square inch of clear or ground glass in it, neither will it ever require a painter, ladder, or plank, on its roof.

I will just say, Mr. Editor, that, should any worthy brother photographer wish to see my studio, I shall be only too pleased to show him over it. I mean any photographer who is thinking of building a studio; but, sir, I shall not allow any one, only through your kind recommendation, simply because a friend of mine, in a town close by, had a strange London operator only for a day or two, and one night shortly after, when my friend was at the mayor's party, he was eased of a whole batch of lenses; so that is my reason for not allowing any one to take stock.—I am, yours, &c.,

J. KENNERELL.

7, *York-row, Wisbech, April* 8, 1897.

FRENCH CHALK.

To the EDITORS.

GENTLEMEN,—I am certainly not aware that two distinct substances are properly known as steatite, as Mr. Bolton says, nor did I enter on its chemistry.

Steatite was, when I learnt something of mineralogy, quite well known, and the synonym for it was French chalk. I find in *Millar's Chemistry* (1st edition) steatite and French chalk are used synonymously, so in *Ure's Dictionary of Arts* (an old edition). In the first edition of *Watts's Dictionary*, indeed, steatite is stated to be sometimes used as meaning the indurated variety of talc, but it is evident to me that it properly means soapstone in its strict sense. I am quite aware that terms are often used loosely by photographers and others, but I venture to think that is a practice to be avoided. Powdered talc may be, as Mr. Bolton says, the best material for the purpose required; I only judged from the characteristic properties of steatite, which is easily reduced to powder by scraping.—I am, yours, &c.,

J. F. T.

April 9, 1897.

IMPERIAL VICTORIAN EXHIBITION, CRYSTAL PALACE.—ALTERATION OF DATE OF OPENING.

To the EDITORS.

GENTLEMEN,—As you have been kind enough to mention me in connexion with Messrs. Negretti & Zambra in the organization of the photographic section of the above, will you now permit me to say that the Exhibition will be opened by the Princess Christian of Schleswig-Holstein on May 6, instead of May 24, as previously announced. Exhibitors will therefore oblige by sending on their exhibits to Messrs. Negretti & Zambra, 38, Holborn-viaduct, E.C., without delay, so that they may be catalogued and in place for the opening.—I am, yours, &c.,

22, *Goldsmith-road, Acton, W., April* 12, 1897. E. W. FOXLEE.

THE ASSOCIATION OF MANUFACTURERS.

To the EDITORS.

GENTLEMEN,—Referring to Messrs. Geddes' letter in your last issue, respecting the Plate-makers' Association and the reduction of discounts to the Professional Photographers, we beg to state that we have not joined this Association, and that our terms to our professional friends are the same as hitherto.—I am, yours, &c., T. E. H. BULLEN.

The Gem Dry Plate Company, Limited.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Hardingham R. Mehew, Lynn-road, Wisbech.—*Photograph of dog wearing wig and spectacles posed as a judge, with dog biscuits.*

Ernest Smith, the Solotype Company, Lewes, Sussex.—*Photograph of group containing the Empress Frederick of Germany, &c.*

Sir Henry Thompson, F.R.C.S., M.B., 35, Wimpole-street, London, W.—*Photograph of a pen-and-ink sketch of the head in profile of W. M. Thackeray.*

H. R. MEHEW.—Difficult to say; but, if the photograph suited such a firm as Spratt's, we should think 5*l.* 5*s.* ample.

W. RICHARDSON.—Send us one or two examples, and we shall be pleased to assist you if we can, and, probably, we shall be able to.

G. K. SMITH.—1. The ordinary syrup of commerce is, no doubt, meant. We gave the formula as we received it. 2. We think not.

LEO POLATSEK.—Messrs. Percy Lund & Co., Bradford, publish a book by Dr. Just, *Bromide Papers*, which gives the information you require.

GELATINE FERROTYPE PLATES.—H. W. B. The only house that we know that stock them is Fallowfield, Charing Cross-road. Other dealers will, no doubt, obtain them to order.

AGREEMENT.—PROCESS. We do not feel competent to give an authoritative opinion on the point in question. We should advise you to consult a respectable solicitor on it before taking any action. Copies of the agreement returned by post as desired.

TONING.—TONING BATH asks: "1. What effect has sulphocyanide of ammonium in toning? 2. Is it necessary, when making up a used bath, to add sulphocyanide of ammonium and gold in same proportion as when making up a new bath?"—1. Causes the bath to tone. 2. Yes; but it is preferable to make a new bath for each time of using than to add to an old one.

COPYING DAGUERREOTYPE.—SALISBURY.—There is no difficulty in doing this. The only thing is to avoid reflections in the direction of the lens. Place the picture in such a position that it is illumined by a side light at an angle of about 45° to the camera, stopping off all the direct front light. It is well to fix the picture so that the light falls upon it in the direction the plate was polished.

LENS.—W. WELLS.—The best way to get the sharpest picture with a lens of that type is to focus the image with a medium-size stop, say, *f*-16, and then make the exposure with the one that is necessary to secure sharpness all over the plate. If the image is focussed with the full aperture of the lens, and a small stop afterwards inserted, the sharpest possible negative is not obtained.

COAL-TAR COLOURS.—COLOUR asks: "Will you kindly answer the following? 1. Is there any difference between coal-tar dyes and aniline dyes? 2. Are they permanent if applied to photographs? 3. Where can I buy the dyes?"—1. Aniline colours are obtained from coal tar, but all coal-tar colours are not aniline colours. 2. Some are, others are not. 3. Any drysalters' or dealers in dyers' materials.

CHOICE OF LENS.—C. W. The lens in question is of foreign make, and we have had no experience with it, or, indeed, had one in our hands. The lenses of the two English makers named are good, and you will do well with either. It is against our rule to recommend particular makers' goods.

STUDIO.—T. BELL. The design shown in sketch "B" is the one we should prefer for all-round work, such as the ordinary portrait photographer is called upon to do. The design "A" is good if the work is that of copying only, but it is not to be recommended for portraiture. "C," as you suggest, is not good, as the light would be too broken up, and it would be difficult to concentrate it when necessary.

BOAT RACE ASPIRANT.—The print shows that the negative, like most others that were attempted at the boat race, is very much under-exposed. It will not be possible to obtain good prints from it showing full detail in the shadows. If the others are, as they probably are, the same as that from which the enclosed was made, the case is hopeless. Possibly, in skilled hands, more might have been coaxed out in the development.

DAMAGED LENS.—T. CALLOW. If the lens is by the maker whose name it bears, it is very cheap at the figure named. Doubtless, the owner thinks the chip on the back glass is of more importance than it is. If you cover the "chip" with black varnish, the lens will be practically as good as ever. The only difference will be the small amount of light stopped by the black varnish, which will be inappreciable in actual work.

ALBUMEN PAPER.—COLONEL writes: "Can you give me the formula for the preparation of albumen for albumenising, and the salting solution suitable for a sixty-grain to the ounce silver bath? I want to try this on a specially prepared paper. To have a good gloss, use the albumen without dilution and float the paper upon it. An even coating is not to be obtained by brushing. About eight grains of chloride of ammonium to the ounce of albumen is a good proportion for a sixty-grain silver bath.

OLD PAPER NEGATIVE.—R. W.—Without seeing the negative we are unable to say whether it is a calotype or a waxed paper one. There is a considerable difference between the two processes—as much as between the wet-collodion process and the dry-collodion process. In the former process the calotype paper had to be exposed wet, within a short time of its preparation. In the latter, it could be kept for weeks before exposure. The waxed paper was a slow process, the calotype a quick one, for its period.

PANORAMIC PHOTOGRAPHS.—J. W. CLARK (Lisbon, Ohio) writes: "Will you kindly explain in the JOURNAL how 'panoramic views' may be taken with an ordinary camera so as to be joined together without having straight horizontal lines showing different directions at the edges of the different prints? In Abney's *Treatise on Photography*, p. 233, an attachment is shown to accomplish this purpose, but the explanation is not clear to me. Among other difficulties, I don't know how to find the 'optical centre' of a rectilinear lens."—On pp. 610–658 of the volume for last year will be found practical articles on the mode of procedure. If the explanation given in Abney's treatise is not clear to you, we fear we cannot make it clearer in this column. If you take the position of the diaphragm as the optical centre of a rectilinear lens, it will be near enough for all practical purposes.

STAINED PAPER NEGATIVES.—J. A. SADLER says: "I enclose seven wax-paper negatives and one of the older type, the Talbotype. Of the seven, there is one, the figure of a lady sitting, which has been ironed to try and get rid of the spots. Three others have been creased in sending to me. The remaining three are fair specimens of the spots alluded to in my former letter. The Talbotype negative has some brown stains, as you can see. The negatives have been laid one on top of the other indiscriminately (*i.e.*, Talbotype and wax paper), wrapped in brown paper, and laid in a cabinet in a dampish library, against an inner wall of the house. The library is often used, that is to say, three or four times a week it has a fire in it."—On examination, we come to the conclusion that the deterioration of the negatives is, primarily, due to the hypo-sulphites not having been washed out at the time they were made, and some of it has crystallised out since, and it can be detected by the tongue. Contact with the silver paper, in printing, no doubt accounts for the stains. The only thing we can suggest for preventing the evil increasing is to thoroughly wash the negatives, dry them between blotting-paper, and then rewax them. We should advise that one or two be experimented upon before the rest are dealt with.

STUDIO CAMERA says:—"I am about to build a studio by knocking two rooms into one, which are 8 feet high; then it will make the studio 34 feet long and 12 feet wide. In the wall looking to the north I intend making an opening 14 feet wide and 9 feet high; the roof is to be only one span from the wall to the front; the top light to be 14 feet (to match the front) by 10 or 12 feet. Which size would be the best out of the 10 or 12 feet? I have forgotten if the top light must be 40 or 45 degrees. Will you let me know? also what is the best size, length, and width of the glass, and how many ounces for the top and front to the square foot? For the front I intend to put 2 feet basement and 7 feet glass. Do you think that will be right? If you will answer, I shall be greatly obliged, as I intend to commence building on Monday next."—Either 10 or 12 feet will do. There is very little difference in practice whether the slope of the roof is 40° or 45°; perhaps, on the whole, the former angle will be the best. Have the squares the largest size the builder can recommend for the strength of the sash bars. The larger the panes in the roof, the thicker should be the glass. It should not, for the roof, be less than 26 ounces, and, if large squares, 32 ounces; thinner will do for the side lights. Two feet six inches at the base will do better than two feet.

*** Several answers to correspondents and other matter unavoidably held over.

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EX CATHEDRÂ.

We may remind our readers that the Great Yarmouth meeting of the Photographic Convention of the United Kingdom will be held in July next, opening on Monday, July 12, and closing on Saturday, July 17. Mr. Harvey George, the Local Hon. Secretary, is busily engaged on the programme, which promises to be unusually attractive. Great Yarmouth's situation on the coast, and within easy access of the Suffolk and Norfolk Broads, Cromer, Norwich, Ipswich, Lowestoft, Sandringham, Southwold, and other interesting places, admits of the excursions being arranged so as to comprehend road, river, rail, and sea journeys, and the opportunities for photographic work will therefore be many and varied.

* * *

The handsome Town Hall will be the scene of the reception by the Mayor, the meetings, the Exhibition, and the dinner. The programme of papers has not yet been definitely arranged, but it will probably be found that photography in its latest aspects, including colour work, will supply the themes touched upon at the business meetings. There is every prospect that the local support will be large, and that circumstances will combine to make the meeting a great success from all points.

* * *

Besides the usual Exhibition of trade work and apparatus, it is in contemplation to hold an Exhibition of photographs of East Anglian scenery, architecture, and other subjects. This will probably be arranged by the President-elect, Mr. F. P. Cembrano, and it is hoped that Dr. P. H. Emerson, who resides at Lowestoft, will co-operate. Such an Exhibition, to contribute to which a general invitation is likely to be issued, should bring together a fine collection of work, which we do not doubt will be much appreciated by visitors to the Convention.

* * *

Messrs. B. J. Edwards & Co., of Hackney, announce that they are prepared to supply their isochromatic and ordinary plates ready backed with a perfectly soluble medium, having the same refractive index as glass. This medium dissolves in the developer, and is readily removed without special precautions.

* * *

The Eastman Photographic Materials Company are organizing an amateur photographic competition, in which 309*l.* 15*s.* in cash, cameras to the value of 274*l.*, and film or bromide paper to the value of 15*l.*, making in all a total of 598*l.* 15*s.*—divided into 130 prizes—will be awarded to successful competitors. The pictures will be exhibited and the competition will be decided in London. The cash prizes will be paid in plate or coin, at the option of the prize winners. All kodakers are entitled to compete for the above-mentioned prizes under simple conditions, which appear in the prospectus, copies of which may be obtained at the Company's branches in London, Paris, Berlin, or Rochester (New York). The Judges are to be Mons. Bucquet (Paris), Mr. Andrew Pringle, and Mr. H. P. Robinson.

* * *

The Paget Prize Plate Company, of Watford, notify that their XXXXX plates can now be supplied backed with orange collodion without extra charge. It is pointed out that orange collodion is a most effective backing, and, being quite insoluble in water and transparent in red light, does not interfere with the development, and may be entirely disregarded until the negative is completely finished. The backing is easily removed.

We have been asked to describe the method of lens-testing devised by Mr. Kapteyn, and referred to by Mr. Dallmeyer in a paper by the latter gentleman that we printed last week. The importance of the subject, as well as the obvious care taken by Mr. Kapteyn to ensure the transmission of an image to the focussing screen under conditions best calculated to display the properties of a lens for particular and comparative purposes, probably justify us in reproducing Mr. Kapteyn's description from the last number of the Photographic Society's *Journal*.

* * *

The room which Mr. Kapteyn used for the purpose was about twenty feet long by nine feet wide, and the end wall had been tested and found to be fairly vertical and flat, and had been covered with prints, diagrams, &c., in such a manner that symmetrical portions could be compared on the same plate. It was, he thought, impracticable to test a lens in a camera supported upon a tripod; and he had therefore arranged a bridge or platform running upon rails fixed to the side walls of the room, so as to be able to move the bridge to and from the end wall which formed the test screen. To secure a perfectly parallel motion of the bridge, the latter should be arranged to travel along the rails by means of a rack and pinion; but, as he had been unable to get this done just at present, he had had the rails marked off in fractions of an inch, so that it could be readily seen whether the front edge of the bridge was truly parallel with the screen. The bridge having been accurately levelled, the camera was firmly screwed down upon it, and the front board of the camera made perfectly vertical and parallel to the screen. With cameras of modern construction, and containing many movements, some difficulty was involved in setting the focussing screen parallel to the screen, and therefore a camera with a rigid body was far better than one possessing all the latest improvements. It was not easy to secure true parallelism of the focussing screen; and, as all his arrangements were not quite completed, he had only been able to do so approximately in these tests. To avoid any error arising from the want of perfect registration of the plate with the focussing screen, it was advisable to remove the central division of a dark slide and insert the ground glass in the exact position to be occupied by the plate.

* * *

Many months ago, our friend, Mr. William Brooks, informed us that he was engaged in experimental work with colour photography, and had succeeded in producing results by the action of exposure and development alone, and without the intervention of dyes or stains. A few days ago Mr. Brooks showed us his first finished result. It is a copy on glass of a landscape in colours, produced in the manner described. The beauty and apparent fidelity of the colours and the absence of any visible photographic base are very striking, the total effect being that of finely deposited colours. Judging by the result, Mr. Brooks's process is full of promise, and, as he informs us that he proposes following it up, it is not improbable that more will be heard of it.

* * *

The Fine Art Society informs us that the collection of miniatures formed during many years by Dr. Lumsden Propert, the first authority on the subject in England, has been purchased by the Society, and will be exhibited by them at their Bond Street Galleries very shortly. The collection has been formed with the dual object of comprising, not only a complete historical survey of the School of Miniaturists, from Holbein downwards, but of the celebrities whom they painted. Thus, from Holbein's celebrated portrait of Jane Seymour onwards, we have every one of the Tudor and Stuart Royalties, as well as portraits of Cromwell, Milton, Drake, Raleigh, Evelyn, Nell Gwynne, and the beauties of the Stuart and Georgian Courts. There are also three of Shakespeare, two being known and engraved as the Sommerville and Auriol portraits. Of specimens of the celebrated and rare early miniaturists, there are no less than nine Hilliards, eleven Olivers, and fifteen Coopers with undoubted pedigrees. Nor is the collection confined to the seventeenth and eighteenth-century English masters, for it is rich in enamels by the Petitots and the foreign schools of miniaturists.

* * *

Our contemporary, *Nature*, states that efforts are being made to establish a national photographic record and survey collection, to be under the direction and in charge of the authorities of the British Museum. It is proposed to form a preliminary committee to organize the work, and to invite to act upon it representatives of the Royal Society, the Society of Antiquaries, the Royal Photographic Society, the Royal Institute of British Architects, the Royal Archæological Institute, the Royal Geographical Society, the Trustees of the British Museum, and others.

ORTHOCHROMATIC PHOTOGRAPHY IN PRACTICE.

It is now upwards of twenty years since the important discovery was made by Vogel of the possibility of special colour sensitising, but at that time, and for long afterwards, it is probable that none of the band of pioneers in that domain of photographic research had the least idea of the practical importance that the new branch of photographic science would one day assume. Indeed, it is remarkable that so entirely a new power should have been allowed to lie dormant until some five or six years later. When Tailfer and Clayton, in France, patented the practical application of the principle under the name of isochromatic photography.

Even when, a year or two later, a patent was taken out in this country for the same process, little interest was, for a time, manifested in the new departure, which, indeed, was regarded in all quarters with a considerable amount of doubt, and it was not until Messrs. Dixon and Gray exhibited what were at that period regarded as marvellous results in correct colour rendering that the photographic world awoke to the fact that there were possibilities in that direction that had not hitherto been dreamt of, save by a very few far-seeing individuals. Since then great advances have been made both in the study and in the practical application of the principles of orthochromatics or colour sensitiveness, principally, however, by Continental *savants*, for in this country, probably owing to a fear of existing patents, research in this branch of photographic science has remained in comparatively few hands, and has been of a purely scientific rather than of a practical character. Now, however, that, at a most opportune time, the ruling patents have, we believe, run out, there is nothing to hinder any one from freely applying all that is known of colour sensitising in any of the rapidly developing branches of photography in which that knowledge is useful.

At the period of Attout-Tailfer and Clayton's French patent, or, indeed, when the English patent was granted, and

for some time after, little was thought of the process except in connexion with the correct visual rendering of colours, chiefly as applied to the reproduction of works of art. For ordinary portrait or landscape work, except under certain conditions, existing methods, without the application of any special sensitising process, were found to generally satisfy all requirements, though possibly, had the importance of colour sensitising been fully recognised before the advent of rapid gelatine plates, the case might have been very different, for one of the principal advantages of gelatine plates over collodion, independent of rapidity, is the nearer approach they give to a correct rendering of colour values. This is one of the results of the vastly enhanced general sensitiveness, but more particularly it must be set down to a proportionately far higher sensitiveness to rays of lower refrangibility than is possessed by collodion plates of any kind.

Of course, in an ordinary gelatine plate, *i.e.*, one not specially sensitised for yellow or red, there is an immense preponderance of sensitiveness in the blue and violet regions of the spectrum over the rest; but there is not that overwhelming difference which, in the case of collodion, but more especially dry collodion, rendered such films practically insensitive to all rays below the blue. True, with a lengthened exposure, some traces of green sensitiveness were evident, but it was of little practical value; indeed, green glass was years ago recommended for dark-room use in preference to yellow. And we need only remind our readers of the difference between the lighting of the wet-plate worker's room and the gelatine developing room of to-day to indicate the practical insensitiveness of collodion to yellow light.

Yet, in the face of this, there remains the undoubted fact that *wet*-collodion plates—we say nothing about dry—were capable of giving very fair, if not perfect, colour renderings in capable hands. If we recollect rightly, as the outcome of a series of colour experiments made by the late J. R. Sawyer about 1879 or 1880, in which various descriptions of collodion plates were compared with gelatino-bromide, the best result, the truest proportionate rendering as regards their visual value of blues, yellows, and reds was given by a bromo-iodised collodion film. But, after all, this and many similar apparent anomalies in connexion with collodion and gelatine colour experiments are easily to be explained by the extreme sensitiveness of the iodide of silver of the wet plate to the white light reflected from the more luminous yellows and reds. Similar experiments repeated with the spectrum or with transmitted artificial colours would lead to entirely different results and conclusions, and this brings us to a point we wish to emphasise, namely, that the ultimate object in view must be studied before the means can be successfully adapted to the end.

The growing applications of orthochromatic photography, or, to speak more correctly, of colour sensitising, at the present day are constantly bringing new workers into the field, many of whom, it is to be feared, fail to recognise the most elementary principles of the subject beyond that the treatment of bromide of silver with certain colouring matters renders it orthochromatic. But what does orthochromatic mean, and what is orthochromatism? If we simply want to render the colours of nature with a certain approximation to their proper visual value, we can do that fairly well without any special treatment beyond giving a sufficient exposure. Not so, however, if the subject be an oil painting or other coloured object, such as a vase of flowers. In the case of a landscape, and to a less extent in portraiture, the actual colours of the subject are so modified by atmosphere and other causes as to become, even to the eye, subsidiary to light and shade, and such subjects, unless, indeed, they include any very pronounced effects of colour, are easily rendered without special precaution in such a manner as to satisfy the eye.

But, in the case of oil paintings, or other objects in which colour is the prime sentiment, and where the gradations of the subject are impressed upon the sensitive plate without the interference of atmosphere or, except to a very slight extent, of modelling, the onus of the work falls entirely upon the colours of the object itself; and these can be but slightly, if at all, altered or modified by simple variations of exposure. It is true some practitioners hold that, by the use of coloured glasses or other transparent media through which to filter the light, modifications in the colour values may be produced; but, though in some cases a slightly improved rendering may be secured by such means, it is, at best, so vastly inferior to that produced by chemical means, and at the same time at the expense of such an extension of exposure, as to render it practically valueless, though the use of the coloured screen in conjunction with a chemically sensitised plate is not only useful, but in many cases absolutely necessary.

The chemical treatment and the use of the screen exercise opposite effects; the one renders the film sensitive to certain coloured rays, the other cuts off certain coloured rays, and so prevents their acting on the film, or practically renders the film insensitive to those rays. Thus, in using a yellow screen in conjunction with a yellow sensitive plate, the blue is rendered more or less inert, and the actinic value of the yellow is increased; but, if we employ a similar screen with a plate that is practically insensitive to yellow, although we may cut off the blue, it is difficult to see what benefit accrues, since the yellow rays left to act possess no power. By the use of screens of different colours, too, different results may be obtained from the same film, for it is rarely in colour sensitising that the action takes place upon one set of rays alone. Thus a plate sensitised with eosine acquires additional activity in both the green and yellow, and may be said to be sensitive from the extreme violet down to the yellow. Now, by the use of a suitable screen, any or all of those rays may be cut off and the remainder left to act, and, if the sensitiveness is also increased for the orange and red, we have a film that, by the use of suitable screens, may be rendered specially sensitive to any one kind of ray, or, on the other hand, insensitive to any particular colour. It is in this application of the principles of colour sensitising that the modern worker in three-colour printing or projection will find the widest scope for his experimental ingenuity.

Mention has recently been made of colour-sensitive plates requiring no screen to bring out their qualities, and such are, no doubt, quite feasible, though, with gelatine films, the principle requires some working out. Probably every dye employed for these purposes exercises a dual purpose; while it sensitises the film for one colour, it slows it for another. Thus an eosine-stained plate becomes more sensitive to yellow and green, but less sensitive to blue, with the general result that, though the relative rendering of the two colours is better, the general sensitiveness is decreased. Similarly, while cyanine confers red sensitiveness, it almost entirely destroys the sensitiveness for yellow, and here, again, a greatly prolonged exposure is

needed. This desensitising power is undoubtedly valuable where it can be so adjusted as to perform its work in a useful direction, and this seems to be possible in dispensing with the colour filters in three-colour printing operations.

New Method of Blackening Brass.—In the *Photographische Chronik*, Herr Fleck recommends the following plan. The metal must first be well cleansed, so as to offer a perfectly pure surface to the chemicals with which it is to be treated. It is then to be dipped into a mixture of water, 100 parts; ferric chloride (40° Beaumé), 50 parts; yellow prussiate of potash (ferrocyanide of potassium), 5 parts. After removal of the article, it should be washed in water, heated, rubbed with linseed oil, and polished with a soft rag.

A New Mode of Storing Acetylene.—MM. Georges Claude and Albert Hess presented a note to the Paris Academy of Sciences, showing how they had devised an ingenious method of storing acetylene gas. This was to dissolve it in acetone, which it seems will under pressure dissolve acetylene almost as freely as water dissolves ammonia gas. When a pressure of 12 atmospheres was used, one kilogramme of the liquid dissolved 300 litres of gas. Thus 1000 cubic feet of gas could be dissolved in a little over 4 feet, say 26 gallons of acetone. We are afraid, however, that the necessity for using pressure would be fatal to the chances of its use in this country, for some time to come at any rate.

The Wet Weather of 1897.—It is very probable that the exceptionally wet weather which has so far characterised the present year is accountable for much of the abnormal depression of business of which so many photographers are now complaining. That the weather has been exceptionally wet is undoubted, and the proof of this is to be found in the statistics compiled by Mr. G. J. Symons, F.R.S. From them we learn that the total rainfall for the first three months was 8·22 inches, which was 2·9 inches above the average for the period. The years 1866, 1877, and the present one are the only years out of thirty-nine in which the maximum has exceeded 8 inches. We must remember, too, that last December was also a wet month.

Sciographs in the Kinematograph.—At a recent meeting of the Glasgow Philosophical Society, Dr. John Macintyre exhibited some remarkable Röntgen pictures by means of a kinematograph. Controlling the motions of a frog's limbs by mechanical means, he illuminated them by a Crookes' tube, actuated by a ten-inch spark coil. He then covered the instrument with lead foil, presumably removing the lens, and substituting for it a lead diaphragm, with small aperture. Then illuminating the tube, and setting the kinematograph, supplied with thirty-five feet of film, in motion, he obtained a series of views of the skeleton, which, placed in the instrument, enabled him to show to a large audience the actual movements of the bones of the limbs.

The Keeping Quality of a Star Negative.—Astronomical measurements are so minute that any variations in the direction of shrinking or enlargement of the film would be fatal to accuracy. Professor Harold Jacoby has been investigating the question by ascertaining whether any deformation of the image had taken place in plates developed about a quarter of a century ago. This he did by measuring a photograph of the Pleiades taken about a quarter of a century ago; as a result he found that the image on this old plate (by Rutherford) had not contracted or expanded in the slightest degree, as shown by comparison with a new plate on the same subject quite recently taken. We have no reason to suppose that the modern dry plate would become deformed, but it must be remembered that at the period named gelatine dry plates as at present made were unknown; wet collodion was the usual medium of expression.

The Limit of Exposure in Astro-photographs.—Mr. Isaac Roberts has stated, in *Knowledge*, his belief that there is a limit of time in photographing stars beyond which no gain is possible, owing to the production of what would, by photographers, be termed "fog." "The film of the negative is, in consequence of prolonged exposure to the latent sky luminosity, darkened in development to a degree that would obscure faint nebulosity and faint stars," and "longer exposures would not reveal additional details of nebulosity or more faint star images." Every care was taken to exclude extraneous light that might cause fog, and its absence was proved by the clear margins caused by the rabbet of the dark slide; yet still fog was there. The photograph he shows that received the maximum useful exposure had seven hours thirty-five minutes.

A New Portable Electric Lamp.—A new lamp, designed originally for bicycle use, but evidently capable of useful employment in photography, is exhibited, at the New York Cycle Exhibition, by the Bell Electric Company. It consists of a rectangular case of rubber divided into two parts, each of which forms a separate battery cell. The elements of the battery consist of a short zinc plug for the negative electrode, and a specially prepared pencil for the positive, and they are inserted through apertures in the top of the case. Each couple forms a battery, and they are connected in series, giving a current of from three to four volts. A single charge of the battery is said to last for ten hours' continuous working. The useful peculiarity of the instrument (which is intended to work a two-candle-power lamp) is that, by reason of its being only one-third filled with liquid, it can be put in or out of use by simply reversing its position. When upright, the liquid does not touch the zinc; when pivoted over, both electrodes are covered.

Art and Lunacy.—We trust our artistic friends will not be offended by this juxtaposition, art and lunacy, but it appears to be an undoubted fact that there is a close connexion between the two mentally considered. Dr. Maraudol, the Physician-in-Charge of the Ville-Evrard Asylum, finds that a considerable proportion of his insane patients show a marked aptitude for painting and drawing, although their past history shows no connexion with these subjects. Dr. Maraudol found that a cure was greatly facilitated by the patients indulging in his kind of occupation. The art classes at the asylum have in fact produced astonishing results already. As some consolation to artistic workers in photography, it may be said that there is no record of photography having any attraction for lunatics; it will put a fair weapon in the hands of the profession against artists of the brush to be able to say that lunatics are to be found among the painters, but not among the photographers.

Increased Use of Aluminium.—It is remarkable that photographic manufacturers do not make more use of this metal than so far has been the case. It is capable of supplementing other metals and wood in so many instances, that the manufacturer who would first earnestly take its use up would be likely to find it very profitable. Of course the difficulty of using solder with it is well known, but there are a multitude of articles for which it could be employed where no soldering operations would be called for. That it is growing in use in other directions is evident from the remarks of the Chairman of the British Aluminium Company, Limited, at their recent annual meeting. He stated that the demand for the metal is increasing to such an extent, that his only fear was that the Company would not be able to meet it. It appears that the Company have entered into an important contract for supplying it to the Acetylene Illuminating Company, Limited, from which we should gather that one of the supposed dangers connected with the use of this gas, the employment of copper, will be done away with. The difficulties thrown in the way of the use of this gas by the Board of Trade are very unfortunate; but we may fairly hope that, when its value and the absence of real danger from its reasonable use are better known, many of the restrictions interposed by this body, and the insurance companies, will be removed.

Physiological Effect of X Rays.—We have brought before our readers on previous occasions accounts of the serious action of Röntgen radiations upon the skin of the hands of various demonstrators; but, according to statements in the *Bulletin* of the John Hopkins Hospital, the action is by no means limited to the surface of the skin; much more serious lesions take place, the deep-seated tissues, the bones, and the periosteum having been found to be affected. If these lesions once take place, ulcers may form and dangerous results follow. The explanation given is the adoption of the emission theory of the radiations. The particles of platinum are supposed to be so infinitely small as to be able to pierce the glass, and, if the glass, the tissues of the body also. These particles then lodge in the tissue, and give rise to the various forms of irritation, the more noticeable of which have already been commented upon. Mr. Gilchrist advises any one who experiences the slightest ill effect after exposure to the radiations to at once discontinue their use.

Litmus Paper and other Indicators.—"Test paper," as it is familiarly known, is, as necessary an adjunct of the printing room as it once was, in the day of wet plates, in the dark room; but the exact meanings of its changes of colour are by no means well known. If the printing bath is acid, it is generally believed that a red colour indicates that acidity; but, when we come to a question—one of more importance than is generally understood—of the state of the toning bath, the indications are more feeble and liable to misinterpretation. Some useful information on this point is to be found in the proceedings of the Paris Academy of Sciences, by H. Lescœur. He points out that the change of litmus to red may indicate either acidity or neutrality. When phenol-phthalein is used, and a red colour is produced, we are to assume not a change from acidity to alkalinity, but from neutrality to alkalinity. Poirier's orange No. 3 is colourless in neutral or alkaline solutions, and red in presence of acids; it therefore shows the passage from neutrality to acidity. M. Lescœur's final conclusion is that a really neutral substance is indicated by phenol-phthalein remaining colourless and litmus becoming red.

Economic Preparation of Hydroxylamine Sulphate.—Any process for cheapening the mode of production of photographic chemicals is naturally of importance to photographers; hence it will be interesting to note that Professor Edward Divers and Tamemasha Haga, of the Imperial University of Tokio, have contributed to the *Journal of the College of Science* of that University a process as above. Briefly stated, the process, which is comparatively simple, is as follows: Commercial sodium nitrite (the potassium nitrite is found unsuitable) and sodium carbonate in concentrated solution is treated with sulphur dioxide till just acid, and is kept two or three degrees below freezing point by a mixture of ice and brine. A few drops of sulphuric acid are added, and the mixture is kept at a temperature of 90° to 95° for two days. The solution is neutralised with sodium carbonate, and evaporated till it weighs only ten and a half to eleven times as much as the sodium nitrite taken. Allowed to cool, most of the sodium sulphate crystallises out and the hydroxylamine salt can be obtained by evaporation of, and crystallisation from, the mother liquor. The product is, on the small scale, about equal to the weight of the nitrite employed.

A NEW POINT IN COPYRIGHT LAW.

For thirty-five years the Fine Arts Copyright Act of 1862 has remained, without alteration, the sole statutory basis of photographic copyright law. Passed at a time when photography was still in its infancy, with all its capacities for extensive development undreamt of, it speaks highly for the accuracy with which its framers moulded its provisions that it can now be so easily adapted to meet all the variations that increasing user has introduced. Of course, during that period, some alterations have been made in the interpretation of some of its more important sections by judicial decisions which have differed from popular belief. The latest of these is the judgment of Mr. Justice Collins in the case of Melville *versus* Hutton, delivered on Monday, April 12, a report of which will be found in last week's Journal.

The pith of the decision lies in this point: It is well known that the copyright of a photograph vests automatically in the person who is the author of it, unless it is made on behalf of another person "for valuable consideration," in which case it would belong to the person paying. It has, therefore, been generally held and acknowledged that, where a photographer induces a celebrity to allow his portrait to be taken, such celebrity paying nothing to the photographer therefor, the copyright belonged unquestionably to the photographer. But the decision in this case shows that it does not necessarily do so.

As lawyers are well aware, though laymen may not be, "valuable consideration" may be given in other shapes than money; and it was held that the permission to multiply and sell copies of a photograph of a celebrity was such a "valuable consideration," within the meaning of the Act, as to rest the copyright in the sitter in the absence of express proof to the contrary. In this particular case there was some conflict of testimony on this point; and it therefore behoves all photographers to be extremely careful to have a definite agreement that the copyright, in such cases, shall belong to them, for otherwise it will be seen that the presumption of the law would be that the sitter had given a valuable consideration in the permission to sell copies, and that therefore the copyright remained as much his property as it would have done if he had paid the usual guinea for a dozen copies. There must be no uncertainty in such an agreement, although it is not absolutely necessary that it should be in writing; and there should be no delay in effecting its registration at Stationers' Hall.

Ernest J. Richards.

ON THINGS IN GENERAL.

"Parturiunt montes, nascitur ridiculus mus." Who could possibly avoid remembering this old saying after reading the full details of the patent specification of the Chassagne, or, to give its full title, the "Dansac-Chassagne," colour process? I have an old "dispensatory" by me which gives working methods for preparing various remedies for the suffering human—viper's broth, stewed cockscombs, freshly deposited and warm (let us call them) unfossilised coprolites, and so on, sometimes a great deal of so on—a dozen or two—but not one out of the whole number of recipes appears half so ludicrous as the wild collection or congeries of chemicals and mammalian products tabulated in the *exposé* of this colour-process bubble; for a bubble, and nothing but a bubble, it should be called. Captain Abney almost burst it in his proposal to have a picture developed "in colours," without M. Chassagne having any knowledge of what the colours were. So far, I have not heard of the proposed experiment having been carried out, nor do I think it likely that it will be.

How very shy these photography-in-colours gentlemen are in letting their processes have a fair, honest trial under the superintendence of experts. But, from a business point of view, with syndicates looming in the distance, they, no doubt, act with real worldly wisdom. At present we know nothing whatever about the other of the two processes that have been holding the public for some time past, so that its inventor can still "ruff it" with the best. It is rather unfortunate that there should be two processes holding the field at the same time, as, though we are all familiar with the periodical hysterics indulged in for twenty or thirty years past, every eighteen months or so, upon

"Photography in Colours

discovered at last," our sympathies are naturally extended to the endeavours to distribute editorial emotion over such an extended field. I leave out of all consideration the really valuable method first described to photographers at the Dublin Convention—Professor Joly's.

Speaking of colours, one's thoughts naturally revert to coloured windows, and one thinks of the article on that subject from Mr. Valentine Blanchard's pen. That gentleman is a past

master of photography, and was one of the pioneers of artistic photographic work, so that everything he writes is entitled to respect; but—I write it with pain—I consider that this article "On the Use of a Dark-room Window looking into the Studio" is a most unfortunate one. An eavesdropper, no matter what his object is, is always spoken of with scorn; but what must be said of a photographer who has an invisible peep-hole through which he can watch the actions of those who are virtually his guests, and in what they deem perfect privacy? I protest most strongly against any such system of spying. I do not, for a moment, suggest that originally the use of the window was seen at first in any other way than as an aid to posing; but Mr. Blanchard himself supplies the most potent argument possible against it. If the truth were known, I expect Mr. Blanchard himself eventually saw the matter in this light, and had the window blocked up, or rendered useless for vision from the dark room.

How many people, I wonder, have read Mr. Seymour Lucas's remarks on wood-engraving as affected by photography? He did not believe the dismal story of wood-engraving being killed by process work. . . . . "Photography might wipe out bad engravers, but artists who put their soul into the work were bound to live," he said. This statement contains a store of truth more than meets the eye at once. When we count up the large number of weekly and monthly magazines that all carry illustrations to help the text, it is evident that, if there were no process work, wood-engravers would have been worked to death. When, however, these illustrations are examined, it is found that, with a few conspicuous exceptions, ninety per cent. of the pictures are process blocks from photographs. At first sight, we might see cause for gratulation upon this aspect of the case; but an inspection, of an exceedingly casual sort, of these pictures is disheartening in the extreme; of all the shamelessly wretched, crude, inartistic, technically below notice views or portraits that have ever been published, many of the illustrations I speak of are the worst. A photograph is a photograph; so the editors evidently think, and, if one that "costs nothing for copyright to reproduce from some inexperienced amateur or some inexpert provincial photographer, so much the better." I am led to making these remarks through seeing amongst others a set of prints, from small process blocks, occupying almost one page in last week's issue of a well-known ladies' illustrated weekly. Most of the pictures are beneath contempt. I did not believe it possible that English journalism could sink so low. I don't suppose the editor paid anything for them, and that will account for the matter.

Every one must sympathise with Mr. Fall in his endeavours to raise the status of the profession, but it is time a warning word be spoken. Photography cannot escape the fate of all other professions. Some few exceptionally clever men rise high and make good incomes. Those who belong to the ruck have to take their chance, and stand the ruinous competition described in Mr. Fall's letter. But where the trouble comes in is that duffers don't know they are duffers; they believe themselves heaven-sent geniuses, and, while sending out exceedingly poor work, expect to get the same prices as their few skilful rivals. Now, this is nonsense. As well might a sign-painter grumble that he does not get prices equal to those of a Royal Academician. I once heard one of this type of painters complaining of the low prices he got. "Yet," said he, "though I get my colours from the same shop as Mr. Mahlstick, buy the same brushes, use the same canvases, he gets fifty guineas where I get one. Is that fair?" So it is with photographers. If a man can't do very first-class work, why should he get heavy profits for making portraits that the average errand-boy could equal after six months' practice? But one word more about competition. Mr. Fall holds up a gentleman as a model photographer as regards getting high prices; and he deserves high prices, for his photography is of exceptionally high character. But I would put the question to Mr. Fall, Does this gentleman, or does he not, run other studios under a different name at what may be termed cutting prices? No one would be more pleased than I to learn that he does not run such businesses. If he does, why, then, he cannot be held up as a paragon who keeps up prices, can he?

FREE LANCE.

PHOTOGRAPHING BEAUTY.

III.

AT the age of three score years and ten man arrives at the allot span of life as set out by the Psalmist. Many, even then, would not thought old, for, as Swift says, "every man desires to live long, but man would be old," "Ætatem non tegunt tempora." Men and wom at this age have made their own beauty or ugliness—they have been architects of their own features. Lord Lytton speaks in one of his nov of a man "who was uglier than he had any business to be;" and, if could but read it, every human being carries his life in his face, and good-looking or the reverse as that life has been good or evil. Wh reader is not familiar with the pictorial advertisement of *Cassell's Popu Educator*, entitled, *What will this Child Become?* Thereon we ha faithfully portrayed the undeniable fact, and who is better able to be it up than a photographer who has daily before him myriads of faces? our features the fine chisel of thought and emotion are eternally at wo Beauty is not the monopoly of blooming young men and of white-ar pink maids. There is a slow-growing beauty, which only comes to p fection in old age. Grace belongs to no period of life, and goodne improves the longer it exists. I have seen sweeter smiles on a lip seventy than on a lip of seventeen. The beauty of old age is more fr quently found in the old armchair by the cottage fireside with gran children round its knee than in the ballroom or promenade.

"A venerable aspect!
Age sits with decent grace upon his visage,
And worthily become his silver locks;
He wears the marks of many years well spent,
Of virtue, truth well timed, and wise experience."

Husband and wife, who have fought the world side by side, who ha made common stock of joy and sorrow, and aged together, are not u frequently found curiously alike in personal appearance and in pitch ar tone of voice, just as twin pebbles on a beach, exposed to the same tid influences are each other's second self. Human life is continually gathe ing new sweetness. As the tiny ball of snow, which, rolled throug yielding fields, at length becomes a monument of crystal purity, human life is continually gathering new sweetness from the rolling year It is this power of accumulation that makes some lives so rich and ful so beautifully rounded into perfection. Kindness comes with a doub grace and tenderness from the aged; it seems in them the hoarded an long-purified benevolence of years.

A well-shaped nose is one of the chief characteristics of beauty especially in old age. The epoch of Louis Quatorze was the epoch great men, great ideas, great things, because it was the epoch of larg noses. The epoch of the Regency, on the contrary, was the epoch c little men, little art, little everything, because it was the epoch of littl noses. All great times, all great people, all great men, have been dis tinguished by large noses. The nose is the rudder of the human frame only placed in front. With a large nose one marches direct to his goa without looking either to the right hand or to the left; but, with a shor nose, a squat nose, or a nose turned up, one generally advances by takin a zigzag line, fluttering to and fro like a butterfly. This is the reaso why children, negroes &c., have no stability of character, in fact ofte have no character at all, but cry and sing without cause, and just a chance directs them. All the generals of the order of Jesuits have bee long-nosed to a man; the order indeed is only recruited from men wit long noses. All founders of empires and systems have been remarkabl for their noses, such as Alexander the Macedonian, Augustus Cæsar Napoleon, Aristotle, and Mohammed. Socrates had indeed little to boas of in this respect, but his favourite disciple Plato made up for th deficiency, and had nose enough for both.

In Japan, the nose is said to be the only feature in a feminine fac that attracts attention. The nose determines the beauty or ugliness the face according as it is large or small. This is probably due to th fact that difference in noses constitutes about the only distinction betwee one Japanese face and another. The eyes are invariably black, the chee bones high, and the chin receding. In Japan a lady who has a large pro boscis is always a raging beauty and a reigning belle. There are few large noses among the natives, and lucky is he or she upon whom nature lavishes one. In all Japanese pictures of beauty, the artist generally turns himself loose on the nose.

I have a cutting (source unknown) by me that says: "To the most casual of observers the nose will always appear a leading, if not absolutely *the* most prominent, feature of the face; and, indeed, the success of the portrait will depend very materially upon the degree of success with which we treat it. Many times the retoucher will be called upon to give absolute form to the nose, and this, it is needless to say, will often tax his ability to the fullest." There is, I find, a diversity of opinion among retouchers, for the one to whom I was apprenticed always paid most attention to the chin.

Speaking of the chin reminds me of a notice I came across in an old magazine issued some time in the fifties; it is amusing if not instructive. It was headed "Being Photographed." "When a lady," it said "would compose her mouth to a bland and serene character, she should, before exposure, say "bosom." If, on the other hand, she should wish to assume a distinguished and somewhat noble bearing, not suggestive of

sweetness, she should say "brush." If she wishes her mouth to look small she must say "flip." If the mouth is already too small, she must say "cabbage." If she wishes to look sorrowful, she must say "kerchunk." If resigned, she must forcibly ejaculate "scat."

Touching upon the treatment of another important feature—the eyes—I cannot do better than repeat the words of Mr. F. M. Sutcliffe:—

"If it be true that the eye is the window of the soul, that member should have our fullest attention in our attempts at portraiture. How often, however, do we find that everything has had more attention given to it than the eyes! but, owing to the want of care and thought in dealing with the sitter's optics, much of the labour spent in aiming for a natural picture is lost. What is the use, we venture to ask, of choosing a most suitable background, and of using all our skill in trying to make our sitter feel at home, if we allow the eyes to look as they never do except when under our treatment? Many photographers seem to think that it is the fact of having to keep still for a few seconds that makes the sitting for a portrait such a terrible ordeal to their patients; but, if they notice, they will find that, until the sitter is asked to fix the eyes on a certain object, the expression is natural, no matter how long they have been sitting still. This being so, we should try to keep this expression during the exposure, and we think that the fault lies with the photographer's everlasting desire for sharpness everywhere, than the sitter's fear of spoiling the picture by moving the eyes, for, even if the operator gives the sitter permission to blink, he too often directs the gaze of the subject to some tiny object or spot which cannot be seen without straining the eyes. To those who notice a fixed look about their sitters' portraits we would say, Try substituting a good-sized picture in place of the speck on the wall or tiny *carte* that you have been in the habit of asking your sitters to admire, and you will be surprised to find, not only no loss of sharpness in the pupil of the eye, but an entire absence of that gazing at nothing which too often stamps the work of the portraitist as lifeless and unnatural. The photographer should, of course, see that the pictures he uses are not too light or surrounded with white mounts."

As an aid to securing successful results from a picturesque or beautiful model I would suggest long exposure; this allows the model to "come down" to an average expression. I find there is far more to be gained by so doing than by just "snapping" when the subject looks "about right." Many years ago I paid a visit to one of the most successful photographers in Cambridge; in the course of conversation, I intended drawing from him his secret of successful portraiture. I, however, had no cause to do so, for, when he took a negative of me a few minutes afterwards, he gave a very long exposure—eight or ten times longer than many others had done under similar conditions. The results, say my friends, are most lifelike and better than the many others that I possess. Of late years I, too, have prolonged exposures and with every success; I consider it invaluable to those who cannot obtain satisfactory expressions.

Rapid plates and shutters, of course, have their uses; for babies they give exactly the required results, as by their aid a fleeting smile may be successfully caught, which is perhaps the only expression a baby has, at least the only one its fond parents wish to see reproduced. Shutters are invaluable when a youngster will persist in wriggling about like an eel all over the studio. For older people I do not consider a shutter advisable, for generally, when it comes to the sitter's knowledge that the exposure is being made, an inexpressible coldness and stiffness comes over the same, which, if "snapped," say, in a fifth of a second, represents an expression which perhaps none of his or her friends have ever seen, consequently they are told that the photograph is as unlike as possible. During a longer exposure the features have a chance to return to their natural state and thus a negative is secured that gives a much more truthful and satisfactory result than the aforesaid "snap." By a long exposure I mean something between twenty and thirty seconds.

A German expert once said he would never consent to take a picture until he knew the person, or had at least talked with him, interested him in the birds and flowers that filled his studio, and learned, if possible, some of the characteristics of the subject; the result was that his work was always good, and he had all that he could possibly do in taking the pictures of those who flocked to his studio. *Apropos* the studio, always keep the same neat and clean, and let it be furnished with some attempt to taste and comfort. Don't allow it to get into a neglected state, and to have the bare and forbidding aspect that many have. When a studio is made bright and comfortable, instead of cheerless and uninviting, we shall probly no longer hear our friends compare a visit to a studio to that of a dentist.

RICHARD PENLAKE.

ON THE AVOIDANCE OF REFLECTIONS.

II.

In a previous article reference was made to the advantages derived by using long-focus objectives in overcoming reflections when working at close quarters in such work as copying.

There are, however, numerous other circumstances where, when dealing with other than single objects, no end of trouble will be experienced in getting rid of eyesores in the shape of reflections. A very common instance of this is met with in a well-lighted interior, such as an elegantly furnished drawing-room. The moment an operator enters such, he is certain to be face to face with a plentiful crop of bright dazzling reflections, visible here, there, and everywhere, over the entire room; and, were the camera merely set down in the most convenient corner, and the plate exposed without any attention being given towards the removal of these eyesores, a result very far from satisfactory would be the outcome of exposing a plate under such circumstances. On the other hand, if the first thing that be attended to is the taking of such steps as will lead as far as possible to the removal of these reflections, then what a difference! Instead of the hard, spotty results, a beautiful soft picture, free from almost any of these eyesores, rewards the operator.

To attempt to enumerate a tithe of the various objects from which unsightly reflections emanate, even in an ordinary drawing-room, would be simply impossible, as there are no two rooms alike, so no two cases will be found similar. There are, however, always present one or two well-known factors that never fail to create eyesores. Among these are glazed pictures hanging on the walls, or, as is not unfrequently the case, fixtures thereon. In ordinary circumstances these yield well-pronounced reflections, so bad, indeed, as very often to cut the picture, as it were, into two portions, the one coming out fairly well in detail, whilst the other is nothing but a bright patch; and, when this result is produced in the case of some family portraits or highly prized picture, no production having such eyesores will ever give satisfaction, no matter how meritorious as a whole the photograph may be.

In making pictures for process work, much can be done to remove these eyesores by working up on the face of the print, and filling in any detail there before the process negative is pulled from such prints; but, in ordinary work, unless the operator pays strict attention to these eyesores and removes the same before exposing the plate, no amount of retouching or dodging will yield satisfactory results. Sometimes the mere tilting of the frame will suffice to remove the reflection; at others, the dispensing with the light from one of the windows may effect a cure, and very frequently it will be found that selecting a standpoint at a different angle to the eyesore will overcome it.

In any case, perseverance will generally entirely overcome, or, at least, considerably modify the trouble. Of course, it is too much to expect to be able to get rid of every patch of reflected light when photographing such subjects as interiors, nor, indeed, would such be desirable, but there are always present certain well-defined eyesores that mar a picture, and which must be removed if the most satisfactory results are desired.

Apart from such subjects as interiors, there are others that, in a sense, may be classed special, which experience alone can teach an operator how to deal with. Coins, and medals, and other articles of varying shape in silver and bright metal, for instance, have frequently to be photographed for the purpose of illustrating books or trade catalogues, in which case the important point to bear in mind is that the design must be maintained, any smothering or obliterating of such by white patches of reflected light being fatal to the results required.

In the case of coins or similar objects, some writers recommend the making of plaster casts, and photographing these instead of the actual coin. In the course of my practice, extending now over upwards of twenty years, it has fallen to my lot to photograph a very large number of such articles for book illustrations, and I have experimented, perhaps, as much as any other worker, in devising the best means of doing this particular kind of work. In this I have had the advantage of the assistance of an expert silversmith, and I can safely assert that every known method of the silversmith's craft has been brought to bear on the operation, so as to avoid the slightest trace of reflections that tend to mar the designs; and, as far as my experience goes, I have never been able to produce such absolutely clean-cut designs, when working on plaster or sulphur casts, as can be obtained by working on the coin itself. Into the various secrets of the silversmith's art, whereby the objects are made to assume not only a different colour, but a matt surface, I need not enter, suffice it to say that I am satisfied the one and only satisfactory method of working lies in dealing with the articles themselves, and photographing the same, but not by ordinary daylight, as many suppose. Any one undertaking the work by means of plaster casts never produces the fine lines in the original to such perfection as when the article itself is dealt with. It is in the method of lighting the coin that the great secret of success lies, and for this purpose there is nothing to equal a good paraffin lamp, shielded almost all round, after the pattern of a microscope lamp, with a shield of plaster of Paris. This enables a beautifully soft light to be concentrated upon the article from exactly the correct spot on the side.

Some writers advocate the use of a medium to deaden the surface of the brilliantly polished or burnished silver, such as rubbing the article with putty or grease, but my experience has taught me to discard such a method, which is very liable to damage or scratch a costly article. When very costly articles are being dealt with, the employment of ice and a few warm smoothing irons will be found to work wonders in the way of yielding an entirely dull surface to any highly polished or burnished surface. Putty should never be used; such is repugnant to any silversmith, or any one that knows the liability such highly polished surfaces have to suffer from the slightest rubbing.

Very many articles are easily treated by merely blowing or breathing upon them during exposure. Silver coins or medals need never be rubbed to deaden their surfaces, and provided they are properly lighted, so as to bring the design in bold relief, any amount of vigour can be

obtained by using paraffin lamps in an absolutely dark room, or one having no cross lights from other sources.

In working after this manner, some consideration must be given to the proper methods of holding the articles *in situ*, and the employment of the most suitable backgrounds, to which I hope to refer in my next.

T. N. Armstrong.

THE CAUSE OF THE FORMATION OF THE LATENT IMAGE ON GELATINO-BROMIDE PLATES.

[Translated from the Revue Photographique (Moscow).]

III.

The photographic plate, as is known, is not acted upon in the same way by different colours of the spectrum. The most active are the blue or the violet rays, according to the preparation of the plates. From the maximum point the curve of chemical action rapidly falls down, approaching to zero in the red and the ultra-violet part of the spectrum. But this normal relation between the plate and the colours of the spectrum can be modified at will by the use of sensitisers (eosine, azaleine, cyanine, &c.) By taking an ordinary plate and treating it with a solution of a sensitizer, we can change the sensitiveness of the plate for different rays of the spectrum. The fact of this change was established by a series of investigations of Vogel, Eder, Ackworth, and many others. The results of these investigations have extended and completed the known law of Vogel, which can be expressed in a general form in the words, "the chemically acting light is only that which is absorbed." By using the sensitisers it was found that the greatest action of light occurred in that part of the spectrum which was absorbed by the solution of the sensitiser. Strictly speaking, this expression of the law is not exact, as the greatest action is found somewhat nearer to the red end of the spectrum, *i.e.*, deflected towards the waves of greater length. As regards the *rôle* of the sensitiser, there is little doubt that its action is entirely mechanical; the sensitiser absorbs a part of the energy of the ray, and, transferring it to the bromide of silver in a strained molecular state, produces crystallisation. In this, as in every transfer and transformation of forces, there is a certain loss of energy which, in the present case, is expressed by the deflection of the band of maximum chemical action from the position of maximum absorption towards the rays of greater wave-length. That the *rôle* of the sensitiser consists only in the mechanical transfer of light energy on the bromide of silver is proved in the first place by the chemical neutrality of the sensitisers, precluding every chemical reaction with bromide of silver, and in the second place, because the action of sensitisers is independent of temperature. Joly* has found that the plate which gave the image with difficulty at the temperature of solid carbonic acid gave it easily after treatment with the sensitiser.

The above facts, as well as some experiments of my own, are most naturally explained by admitting that the light, in acting on the photographic plate, produces in the bromide of silver molecular changes resulting in its crystallisation under the mechanical action (stroke) of the light-wave. The preliminary heating of the emulsion prepares, so to speak, the bromide for crystallisation and produces the extraordinary rapidity characterising our photographic plates.

My view of the formation of the latent image explains satisfactorily all the facts relating thereto as far as they are known to me. Apparent contradiction is found only in the phenomena of solarisation; but even this contradiction is satisfactorily explained by the investigations of Eder, Liesegang, Abney, and others, who have observed that a plate which has been exposed for a comparatively long time, and gives only a weak image, has become impermeable to the developing solution. Eder explains it by the change of gelatine under the action of light; Liesegang,† by the formation, on the surface of the plate, in the beginning of the development of a continuous film, of metallic silver impervious to the developing and fixing solutions. However that may be, the phenomena of solarisation do not contradict my views on the cause of formation of the latent image.

In concluding, I cannot pass in silence some facts relative to the bromide of silver which are found in photographic literature. Many have worked on the subject, but the results of their investigations are not in close agreement. Stas admits the existence of six modifications of silver bromide; others, a smaller number; while the thermo-chemical investigations of Berthelot‡ made it probable that there are only two forms of bromide—amorphous and crystalline, the latter formed with a greater disengagement of heat. This fact confirms my views, as it is a long-established fact that chemical combinations, existing in several modifications have a tendency to pass into that which is formed with the greatest evolution of heat.

As is well known, the visible spectrum constitutes only a small part of the whole range of ethereal vibrations. Beyond the ultra-violet and the ultra-red part of the spectrum, there are long series of waves, which do not act directly on our retina. Some of those waves can be made evident by means of a photographic plate. Some were found to possess the property of passing through opaque solids and impressing a photographic plate. As long ago as 1881, Abney and Festing* have found that some of the ultra-red rays pass freely through ebonite and other solids, and can act on a photographic plate prepared in a special manner. Later on, the investigations of Hertz, Lenard, Röntgen, and others have added much to our knowledge of the waves of ether, of very short length, acting on the photographic plate. On the other hand, the investigations of Le Bon and others of the properties of black light (*lumière noire*) have shown that very long waves of ether have much in common with the Hertz-Röntgen rays. So, as in the spectrum we have a series of light waves only some of which have actinic properties, so, amongst the invisible undulations, there are some which can act on the photographic plate, and others which have not that property. In the series of undulations we find waves of very short period (Röntgen rays), which act on the bromide of silver plate; after them come the ultra-violet rays of greater wave-length, having no direct photographic action; then the violet and blue rays, of still greater wave-length, having strong photographic action. From the green, through the yellow, orange, red, and ultra-red part of the spectrum, through the little-known or entirely unknown region of waves of longer and longer periods, photographically inactive, we come, in the end, to the actinic rays of very great wave-length (Le Bon's rays).

If we admit the views expressed above, we must necessarily come to the conclusion that, for the transformation of the amorphous bromide of silver into the crystalline, there must exist a certain relation between the vibrations of the molecule of silver bromide and those of the ether waves. In fact, there is such a relation, and, although not yet quite explained, it has attracted the attention of men of science. So Abney† has shown long ago that, to increase the sensitiveness of the plates for red rays, it is necessary to prepare the emulsion in such a way as to obtain the molecules of silver bromide of larger volume, and consequently of slower rate of vibration. It seems to me that we can compare the bromide of silver on the photographic plate, in its relation to the light waves, to a stretched string, which can be set vibrating, not only by the waves of its own fundamental note, but also by its octaves. In a measure we can regard the silver bromide of the photographic plate as a resonator for the light waves.

The influence of the volume, of the molecule of silver-bromide, on the sensitiveness for different rays of the spectrum is confirmed by the observation of Vogel‡ that bromide of silver precipitated from aqueous and alcoholic solutions has different sensitiveness; this depends undoubtedly on the difference of volumes of molecules precipitated from different solutions and the rate of vibration depending from their size.

Prof. G. Lagermarc.

* *Photographisches Wochenblatt*, 1894. No. 31.
† *Photographisches Archiv*, 1886, p. 129.
‡ *Annales de Chimie et de Physique* [5], 29, 245. (1883.)

* *Philos. Magazine* [5], II. 466. † *Philos. Mag.* [5], C., 154.
‡ H. Vogel, *Handbuch der Photographie*, 4 Aufl., i. 162.

FOREIGN NEWS AND NOTES.

Physical Intensification of Gelatine Negatives.—In the February issue of the *Photographisches Wochenblatt* a formula was quoted from a contemporary for this purpose. A reader, having failed with the process, inquired as to the cause, and it was found that the quantities had been incorrectly given. This failure has led to further investigation of the subject by Herr Gaedicke. He is informed that Hans Schmidt is the author of the process. Gaedicke has endeavoured to ascertain the part played by each ingredient, and to adjust the quantities upon a rational basis. He recommends the following proportions:—

Distilled water	1000 c c.
Sulphocyanide of ammonium	480 grammes.
Nitrate of silver	20 „
Sulphite of soda	240 „
Hyposulphite of soda	48 „
Ten per cent. solution of bromide of potassium	60 drops.

The solution will keep, and for use take:—

Intensification solution	6 c. c.
Water	54 „
Rodinal	2 „

After fixation the plate is rinsed a few times and then immersed in the physical developer, or, if local intensification is desired, the latter is poured on from a spouted vessel. This formula is adjusted for the intensification to proceed slowly and finish in from five to ten minutes. If over-intensified, the image may be reduced with ferricyanide of potassium and hyposulphite of soda, and, should the reduction have been carried too far, the negative may be re-intensified by repetition of the physical development. A curious effect in the process is produced by the addition of bromide, which has an accelerating, instead of restraining, action. Its use is not to be recommended, as the intensification should proceed slowly with a

gelatine film, otherwise inequality of action may occur. It is not necessary to use rodinal only, pyrogallic acid, glycin and other reducers of silver may be substituted, but metol is uncertain, as it is known to have caused frilling. The following advantages are claimed for the method:—

It is not poisonous. It is simple and easy to use. Slowness and certainty of action. The silver image is intensified with silver. Complete removal of the hyposulphite of soda after fixing not necessary. The intensification may be reduced, or repeated. If this is found to be a certain process, it is hoped the time is at hand when intensification with bichloride of mercury will be a thing of the past.

Protection against Damp, Grease, and Acids.—The protection of photographic materials from these dangers has received much attention, and paraffin paper has been extensively used. U. Heger, in the *Photographisches Wochenblatt*, draws attention to pyroxyline papers for the same purpose, and thinks they have a great future. Certain pyroxyline papers treated with sulphuric acid require a coating of gelatine and glycerine to make them hold a collodion film, but there are other sorts with which such a substratum is unnecessary, and these are known as parchment papers. This sort consists largely of hydro-cellulose, but it is not produced by converting paper into hydro-cellulose with sulphuric acid. It is made by milling sulphite cellulose, with certain additions, until a gelatinous mass is produced. This gelatinous substance is generally held to be hydro-cellulose, although it seems extraordinary that sulphite cellulose may be converted into hydro-cellulose by purely mechanical treatment. This process is patented, and the paper can be coated with collodion without any further preparation. Papers prepared with sulphuric acid can be made to hold a collodion film by treatment with ammonio oxide of copper. By this means the hydro-cellulose is softened, and after preparation with a solution of pyroxyline the collodion will adhere perfectly. It is therefore possible to prepare a collodion stripping film on parchment paper by using a substratum of gelatine and glycerine soluble in warm water; or a parchment paper may be coated with a firmly adherent film of collodion if the other descriptions are used.

To Blacken Aluminium.—*La Photographie Française* recommends the following process:—The metal is first washed with soda and water to remove any trace of grease. It is then coated with albumen, prepared by beating the white of a fresh egg to froth and allowing it to settle. As soon as the film is dry the metal is gradually heated until quite red hot. A crust is formed upon the surface, and, upon its removal, the metal will be found, with a deep black surface, capable of resisting any acid, and so tough that it can only be removed with a file.

What shall we Learn?—Dr. H. W. Vogel gives the following answer in the *Photographische Mittheilungen*. The amateur is easily answered. Let him learn what interests him most, his aim is not business, but pleasure. The dry plate and silver print interest the many, the carbon process a few, but other processes only attract the specialist. For the professional who looks to portraiture let him study art and drawing, both being indispensable, and even of more importance than chemistry. Retouching is also necessary, and guilty of a multitude of sins, but the public demand it. The collodion process is recommended as an excellent training for cleanliness and exactitude, in which respects it is without a rival, and, although many beginners will not hear a word about it, who knows that orthochromatic collodion emulsion may not yet be used for portraiture? Every printer should learn the carbon process; but there are many studios where the more highly trained operator must do this work himself. Carbon may not be the most suitable medium for all kinds of prints, but it is unsurpassed for transparencies for enlargement. At the Imperial Technical College the carbon process is a necessary preliminary to all photo-mechanical processes. The platinum process is better known, but needs further cultivation.

Drying Films.—In the same paper a correspondent asks for a means of flattening films that had been immersed in alcohol to facilitate drying. Although several rolls had been treated successfully in this way, the last two were hard and brittle, and it was impossible to obtain a sharp print from them. The manufacturers were unable to suggest a remedy, but the editor of the *Mittheilungen* found the following treatment successful, which may interest some of our readers:—Immerse the films, after washing, for five or ten minutes in a bath of alcohol (ninety-six per cent.), to which is added one to five per cent. of glycerine. It is preferable to use a second bath, as the first may become too dilute with the water abstracted from the gelatine. Allow the films to drain well, remove superfluous moisture with blotting-paper, and dry under pressure in a copying frame, between blotting-paper, which should be changed after a short time. Any adherent fibres of the paper may be removed by rubbing with a rag moistened with alcohol.

Home-made Platinum Paper.—We also find in the *Mittheilungen* an article by Paul Hanneke, recommending the preparation of this paper to attain special effect. For a support, use unsized Rives' paper, prepared with arrowroot. Take five grammes of arrowroot, and rub down in 200 c.c. of distilled water in a porcelain dish, heat and stir with a glass rod until the paste becomes a fluid, transparent mass. Brush it over the paper and hang up to dry. For the hot-bath process make the following solutions:—

1. Platino-chloride of potassium in 12 c.c. of distilled water ..... 3 grammes.
2. Schering's solution of ferric oxalate.....
3. Chloride of sodium in 10 c.c. of distilled water ..... 1 gramme.

For a sheet of paper 50×65 c. take 4 c.c. of No. 1, 5 c.c. of No. 2, 3 c.c. of distilled water, and 6 drops of No. 3, and apply it to the paper with a wad or sable brush. The paper should be stretched upon a drawing board, and the solution brushed on in both directions. Dry in the dark at a temperature of 30. to 35° R. Paul Hanneke recommends this paper as giving softer results, but it will not keep for a great length of time.

The Free-portrait Dodge.—From the *Deutsche Photographen Zeitung* we learn that even in Germany this trick has met with considerable success. Last autumn, at the Trier Convention, a specimen was exhibited of the work sent out to the confiding public. The wife of a German photographer wished to present her husband with a pleasant surprise, and sent her photograph for enlargement. The charge for the frame was to be 5*f.*, but it was raised to 10*f.* Needless to say, the whole thing was worthless, yet it seems that some sixty people in Trier alone had been victimised. We now read that the same Mr. A. Tanqueray, 29, Boulevard des Italiens, Paris, is again offering portraits on the coupon system. If you can induce two of your friends to buy frames, they will have enlargements presented to them, and, as commission, you will receive a framed enlargement for your trouble. Our friends in Germany seem no less gullible than the British public, notwithstanding the advantages of State education and imperial rule.

From a Studio.—Old gentleman, looking at a portrait of his son: "Very like him! Has he paid for them?"

Photographer: "No!"

Old gent: "Very like him also!!" (From *Die Photographie.*)

COLOUR-SENSITIVE PLATES.

In the current number of the *Deutsche Photographen Zeitung*, Herr Vollenbruch gives the following details of home-made colour-sensitive plates:—

Erythrosine is the best dye to use unless great red sensitiveness is required, when cyanine or chlorophyll should be tried. Many processes have been suggested, but few of them give plates that will keep, particularly when the dye is used in conjunction with silver nitrate; but Vollenbruch states that he has got over all the troubles, and is able to make plates that will keep; and he does this by using the citrate, tartrate, or acetate of silver, in preference to the nitrate.

In order to do away with the yellow screen, he stains his film with picric acid, a method which, as has already been pointed out in these columns, is not new. It is open to question whether the addition of larger quantities of erythrosine would not have precisely the same effect as the addition of the picric acid, the only doubt in my mind being whether increase of the erythrosine would not dampen the green too much, a region of the spectrum which is at all times weak.

Two solutions are first prepared:—

1. Potassium citrate ..... 1 part.
   Distilled water ..... 10 parts.
2. Silver nitrate ..... 1 part.
   Distilled water ..... 10 parts.

These are mixed in equal parts, and a white precipitate of silver citrate is thrown down, from which the supernatant liquid is decanted, and the precipitate washed twice or three times with distilled water, and then 20 parts of distilled water are added to the precipitate, and 5 parts, after well shaking, are measured off, and to the remainder, sufficient ammonia is added to cause the precipitate to dissolve, and then the 5 parts previously measured off should be added, and the whole well shaken. The idea of this is probably to avoid excess of ammonia, and is similar to Hardwich's method of making ammonia-nitrate of silver.

Sufficient distilled water should now be added to bring the volume up to 50 parts, and the solution then filtered, and should be labelled Solution 3.

The sensitising solution is made by dissolving

3. Erythrosine	1 part.
Distilled water	300 parts.

To this solution should be added the 50 parts of Solution 3 by lamp light with constant shaking, and the red solution will now turn bluish-red, cloudy, and somewhat thick. To this is added—

4. Picric acid	4 parts.
Absolute alcohol	30 parts.

The mixture must then be well shaken, and 33 parts of ammonia, sp. gr. 0·91, should be added, and the solution turns red, and should be filtered and labelled, when it (Solution 6) is ready for use. It will keep a long time, but a precipitate gradually forms which dissolves on shaking.

When erythrosine silver is made with silver nitrate, it also deposits red crystals of the erythrosine silver salt, but, according to my experience, these will not redissolve.

To colour-sensitise the plates, they should be bathed, first, for two or three minutes in distilled water, and then immersed for one minute in a one per cent. solution of ammonia, and then bathed in the dye solution.

Solution 5	10 parts,
Distilled water	300 ,,

in which the plates should remain two minutes, then well drained and dried in an absolutely dark room. A clean working plate will keep after this treatment at least two months, and the most sensitive plates for six or eight days.

The plates, if required to be kept, should be separated by slips of chemically pure blotting-paper and wrapped in ordinary black paper. Great care should be taken not to touch the films with the fingers. The general sensitiveness of the plates is stated by Vollenbruch to be higher after this treatment, a statement which requires confirmation because of the presence of the picric acid.

Vollenbruch also suggests a a method of dyeing the emulsion, and suggests the following formulæ:—

1. Water	1800 parts.
Heinrich's gelatine (soft)	100 ,,
Ammonium bromide	118 ,,
Oxymethyl-sulphonate of soda	6 ,,
Solution potassium iodide (1 : 5)	16 ,,
2. Siver nitrate	180 parts.
Distilled water	1200 ,,

To this sufficient ammonia is added to redissolve the precipitate first formed.

The gelatine is soaked in water heated to 60° C., and then mixed with the lukewarm gelatine solution and digested for one and a half hours in a water bath of 60° C., and frequently stirred. The emulsion should then be poured out to set, broken up, and washed as usual. Then 240 parts of soft and 50 parts of hard gelatine should be soaked in water for half an hour, well pressed, and added to the emulsion and melted, and the volume of the emulsion made up to 4500 parts, filtered, and put in an ice cupboard to ripen. If coated when fresh, it is not so sensitive as after two days, and it has a tendency to form streaks. When the emulsion is ripe, it should be melted at 50° C., and 80 parts of the dye solution added to the above quantity.

If a very sensitive emulsion is required, *i.e.*, about 25° Warnerke, the same procedure as indicated above should be adopted, only to the bromised gelatine should be added 0·35 parts of chemically pure hypo-sulphite of soda, $Na_2S_2O_35H_2O$. The emulsion is mixed as stated above; only, after the mixing, 750 parts should be set on one side, and the rest digested as above, and then the two parts mixed and melted together.

A. D. Pretzl.

DANSAC & CHASSAGNE'S COLOUR PHOTOGRAPH PROCESS

Supplementing our leading article of April 9 on the Chassagne Colo Process, we here append the complete specification of the patent, whi is taken out in the names of Dansac & Chassagne:—

Their process, they state, relates to the application of colours, similar the natural colours on any photographic picture, whatever be the suppo paper, glass, organized or organical body, &c., of the photographical obtained picture, the pigments we use being also applicable for use any ordinary process of dyeing or printing of any kind

This result is obtained by means of different chemical products which we give the names and the manner of using them, which we sh explain hereafter. These products being mixed, we give to these mixtur different names. These names are five. Each of them corresponds to different mixture. They are the following: 1. Albumen for shadow 2. Albumen for reliefs. 3. Blue pigment. 4 Green pigment. 5. R pigment. We indicate successively the composition of each of them.

1. *Albumen for Shadows.*—We compose this albumen for the shadow in the following manner: We take 1000 grammes of distilled water, rain water, which we heat to 37° or 40° C. Then we divide this wat into two equal parts and pour each part into a vessel with a large openi —the vessel may be either in stoneware or of glass. In one of the vessels we place 200 grammes of albumen from pure blood, which w dilute strongly by mixing it every half hour during three or four hour When the albumen is well dissolved, we let this mixture repose durin twenty-four hours.

When this mixture is made, we take the other vessel in which are th other 500 grammes of water, and we add thereto 1 gramme platinu chloride, 1 gramme sodium chloride, 1 gramme palladium chloride, gramme ammonium chloride, 1 gramme iron chloride, 1 gramme chr mium chloride, 1 gramme cobalt chloride, 1 gramme gold chloride, gramme tin chloride, 1 gramme barium chloride, 1 gramme nick chloride, 1 gramme strontium chloride, 1 gramme cadmium chlorid 1 gramme mercury chloride, 1 gramme silver chloride. We let thes chlorides successively dissolve and repose during twenty-four hours i the shade. After this we take a flask of 125 grammes, and put therei 10 grammes of hydrochlorate of cocaine. We expose this flask c cocaine to the light during four or five minutes, and fill it afterward with water. We put this flask during twenty-four hours in the shade.

After these three operations are made and the twenty-four hours hav passed, we take the first vessel in which is the dissolved blood albumen and we add thereto 5 grammes of sulphate of soda, 1 gramme of oxali acid, and 25 centigrammes of corrosive sublimate, which are mixe together. When this mixture is made, we put about 100 grammes of i into another vessel, and we crush a fresh egg therein, adding a pinch o hemoglobine. When this egg is well whipped in these 100 grammes o albumen and the hemoglobine, it is added to the 200 grammes of albumen that is to say, it is poured again into the vessel where we had dissolve 200 grammes of blood albumen in 500 grammes of water. The whole i then well mixed. After this the flask of cocaine is poured therein, an the whole is well mixed together. Then we take the vessel in which w have dissolved the chlorides, and, putting before us another vessel larg enough for containing the liquids and mixtures of the two first vessels we take one of these two vessels in one hand and the other in the othe hand, and pour the whole, at the same time letting each liquid fal slowly, into the large vessel, and from a height of 15 to 20 centimetres.

In proportion, as the two liquids are poured into the large vessel, thei mixture swells, and, when the operation is finished, this mixture present a volume nearly equal to that of 2000 grammes of water. We let thi mixture repose during twenty-four hours in the shade. The albumen fo shadows is now made.

2. *Albumen for Reliefs.*—Twenty-four hours after the albumen fo shadows is made, we take the half of this albumen in an open vesse and add 1 gramme of picric acid, 1 gramme of chromic acid, 10 cent grammes of formic acid. We take another vessel, into which we pou 125 grammes of distilled water, and we dissolve in this water 5 gramme of sodium chloride, 1 gramme of platinum chloride, and add 50 gramme of fresh caseine, and we mix to saturation. When this mixture is made, we pour it into the vessel which contains the part of the albumen of the shadows into which we have put the picric, chromic, and formic acids. We thoroughly mix the whole and let it repose twenty-four hours. The albumen for the relief is then ready.

3. *Blue Pigment.*—We take 10 centilitres of the shadows albumen which is poured into 1000 grammes of distilled water, in which has been melted 1 gramme sodium chloride. We take 100 grammes of this solution and add 5 grammes of carmine of indigo, 5 grammes of oxalic acid. This is dissolved, and into this solution are poured the 900 grammes remaining of the 1000 grammes water, into which there has been put 10 grammes of the shadows albumen, and 1 gramme of sodium chloride. The whole is mixed and agitated several times during three or four hours. It is then left quiet for twenty-four hours. The blue pigment is then ready.

4. *Green Pigment.*—Five centilitres of the shadows albumen and 5 centimetres of the relief albumen are poured into 1000 grammes of distilled water, in which has been dissolved 1 gramme of sodium chloride. Fifty grammes of this solution are poured into one flask, and 50 grammes of the same solution into another flask. In the 50 grammes solution

of one of these flasks is dissolved: 1 gramme of nickle chloride, 1 gramme of chrome chloride, 1 gramme of copper chloride, 1 gramme of sulphate of copper, 1 gramme of nitrate of copper. In the other flask containing the other 50 grammes solution are dissolved 1 gramme of picric acid, 1 gramme of carmine of indigo. When this solution is made, the contents of the two flasks of 50 grammes is mixed, by pouring that which contains the five sorts into that which contains the picric acid and the carmine of indigo.

When this mixture is made, there are added the 900 grammes remaining of the 1000 grammes, into which have been put 5 centilitres of the shadows albumen, and 5 centilitres of the reliefs albumen, and 1 gramme of sodium chloride. The whole is agitated several times during the three or four first hours which follow, and it is left quiet during twenty-four hours. The green pigment is then ready.

5. *Red Pigment.*—Ten centilitres of the reliefs albumen are poured into 1000 grammes of distilled water in which has been dissolved 1 gramme of sodium chloride. Fifty grammes of this solution are poured into a flask and 50 grammes into another flask. In one of these flasks are dissolved 1 gramme of sulphide of mercury or cinnabar, 1 gramme of iron sulphate, 1 gramme of acetate of uranium. In the other flask are put 5 grammes of sulphocyanide of ammonium. The 50 grammes of this solution are poured into the 50 grammes of the other solution. After the mixing of the two solutions, about 30 grammes of caseine are mixed therewith, and then the whole is poured into the 900 grammes which remain, into which have been put 10 centilitres of the reliefs albumen and 1 gramme of sodium chloride. The whole is mixed several times during the three or four hours which follow, and this mixture is left then quiet during twenty-four hours. The red pigment is then ready.

Manner of Operation.

All the liquids which we have now made cannot be used before about eight days, and they produce a sufficiently appreciable result only when they are several (three to four) months old; but after the eighth day they can be used, tried, and judged. For this purpose 10 centilitres of the shadows albumen are put in 1000 grammes of distilled water with 1 gramme of sodium chloride and 10 grammes of the reliefs albumen in 1000 other grammes of distilled water saturated with 1 gramme of sodium chloride, which makes about 1 litre of product in each vessel. We take a photograph that has been taken on nitrate of silver paper, the photograph is wetted with the shadows albumen; this photograph, thus wetted, is extended upon a plate glass or upon a marble table, face downwards, then the reverse of the picture is wetted with the same liquid, the shadows albumen; two or three minutes are allowed to elapse, and this reverse is again wetted with the reliefs albumen. The photograph is turned and extended face upwards upon the glass or the marble. Then one takes with a badger's-hair brush blue pigment, that is to say, prepared according to the formula before described, and washes the whole photograph. Then wait two or three minutes. If the parts of the picture which are to be made blue are not blue enough, or have not the exact tint of the blues desired, one passes blue pigment again over these parts until it is sufficient. Three or four washings are generally sufficient. The application of the blue pigment gives the whites, the greys, and all the blues according to the treatment adopted and regulated by practice according to the judgment of the operator and the tones he wishes to produce. When the blues are obtained and without minding the wet state of the photograph, the latter is washed with a badger's-hair brush wetted with the shadows albumen prepared for this operation.

When this washing is done, and without waiting until the picture is dried, one passes over the whole picture a badger's-hair brush wetted in the green pigment diluted with ten times its volume of the shadows albumen and the reliefs albumen such as prepared for the operation. The parts of the picture where the greens are not enough accentuated are again treated with the green pigment as many times as desired, until the tones desired, such as yellowish green, medium green, or dark green, are obtained. Three or four times are usually sufficient. The green pigment gives all the yellow and green colours. When the greens are obtained, and without minding the wet state of the photograph, the whole picture is washed with the reliefs albumen prepared for this operation. When this washing is done, the whole picture is washed with a badger's-hair brush placed in the red pigment diluted with the reliefs albumen, and the parts of the photograph which are wanted to be more or less red are correspondingly treated and accentuated. Two or three coatings are sufficient to give the red wanted. The red pigment gives tones between flesh and black-red colour. The photograph thus ready wants only to be washed with the shadows albumen and allowed to dry. It is inalterable in the air, the sun, the damp, &c. It can be washed with alcohol of 90° without injuring it. The process is the same for photographs on other materials than paper, but it is obvious that, when the support is impervious, it is useless to apply any of the liquids to the back of the support.

The claims are for:—1. The albumen for shadows and for reliefs, and their application to photographs made upon any support, paper, glass, fabric, porcelain, stoneware, earthware, wood, substance, material, &c. 2. The composition of the blue, green, and red pigments as described hereinbefore.

URANIUM INTENSIFIERS AND REDUCERS.

The Cresco-Fylma Company's method of employing uranium for the above-mentioned purposes is described as follows:—

Uranium nitrate, when used in combination with ferricyanide of potash and acetic acid, as is usual in photographic procedure, has the objection that, when there is practically little or no silver reduced by the developer, those parts stain, and render the increase of density and colour so even or technically flat as to be of no great service.

Should this formula (with modifications in the amount of chemicals to suit special purposes) be used, the deposit of uranium is more regular, and increase of range of density or tone much greater, and the results more permanent.

The formula we prefer is as follows:—

	Water	6 ounces.
	Acetate of uranium	120 grains.
Of either	Acetic acid / Formic or citric acid	½ ounce.
	Ferridcyanide of potash	50 grains.

To this formula may be added, for toning bromides and transparencies special colours, sulphocyanide of potassium or nitrate of strontium, from five to seventy grains.

Though we may use acetic acid in the above formula in the case of tabloids, this ingredient would be omitted, the other ingredients ground together and mixed with some adhesive substance, such as celluloid and amyl acetate, which, though containing no water to start chemical action, would be readily dissolved in acetic acid and water.

The negative, positive, or bromide print to be treated is immersed in the above solution, and the increase of density judged by viewing by transmitted light, and afterwards well washed in water, to which a small piece of carbonate of soda (one drachm in twenty ounces) has been added.

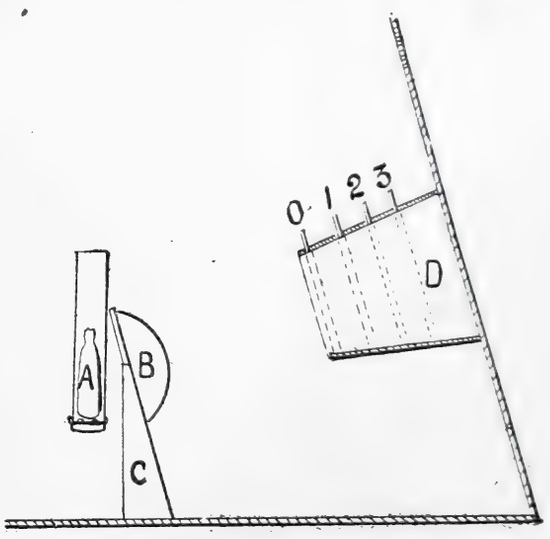
If it is desired to reduce the amount of density, the film is first intensified, and afterwards transferred to the ordinary hyposulphite of soda fixing bath, to which a few drops (one per cent.) of ammonia is added.

McNAB'S IMPROVEMENTS IN RETOUCHING DESKS.

The invention contemplates the use of a steady and powerful light, such as incandescent gas, electric light, and the like; a plano-convex lens or a spherical globe containing tinted water or other fluid, with a combination of ground and tinted glasses, inserted in a conical grooved box.

In this manner Mr. McNab produces a steady and efficient light for retouching, which can be increased or decreased at will, without losing the efficiency of the light.

In the drawing A indicates the illuminant; B indicates the plano-



convex lens with stand, C; D indicates the conical grooved box; 0, 1, 2, 3, indicates grooves and glasses inside box, open at top.

The claim is for the combination of a steady and powerful illuminant and a plano-convex lens or spherical globe, with an arrangement of ground or tinted glasses inserted in a grooved box, whereby the light can be modified or increased at will, producing a steady and efficient light for retouching.

THE SANDELL EXHIBITION.

Until Friday, May 14, there will be on view, at Rochfort Tower, 215, Selhurst-road, South Norwood, S.E., an Exhibition of photographs, organized by the Sandell Works Company. The photographs, which number considerably over 400, are chiefly the work of the able Managing Director of the Company, Mr. J. T. Sandell. They are all taken on the

multiple-coated or Sandell plates, and, to quote from the introduction to the catalogue, "it is believed that they fully illustrate that all the claims which are made for the plates are well grounded, *i.e.*, halation from support reflection is perfectly remedied; all gradations in the lights and shadows which can be appreciated by the eye are truthfully rendered." The handsome rooms of the Company are admirably adapted for the purposes of the Exhibition, being lofty and well lighted, and it is evident that great trouble has been taken to present the display in an attractive aspect. So successful have been the organizers in this regard that, even to *blasé* exhibition-goers like ourselves, there was real pleasure in going the round of the well-arranged walls.

To such a large number of photographs possessing, if we may so phrase it, an unusual monotony of excellence all through, it is only necessary for us to refer in general terms. With the views of Continental cathedrals, palaces, and similar subjects, and a great many of the home photographs we were already familiar; but, during the last year or so, Mr. Sandell has industriously increased his collection, so that the Inns of Court, the premises of some of the learned societies, the Yorkshire abbeys, the London Guildhall, and the halls of about twenty of the City Companies have supplied him with fine opportunities for demonstrating not only the valuable properties of the Sandell plates, but also his own remarkable ability as an architectural photographer. Indeed, in the latter respect, it is but bare justice to Mr. Sandell to say that it would be difficult to excel most of his productions.

Regarded collectively as a display primarily designed to illustrate the anti-halative properties of the Sandell plates, the Exhibition must be considered entirely successful, and, in the general photographic sense, moreover, it is worth all the journey to Norwood to see and study. It is difficult to select examples for individual mention; but, among others that deserve special notice, we may cite No. 93 (*The Princess Charlotte Cenotaph at Windsor*), a difficult, dark monumental subject, that had two days' exposure. As examples of harmonious lighting and good gradation, we noted No. 113 (*The Room where Anne Boleyn was Condemned, Windsor*), and No. 127 (*The Guard-room, Lambeth Palace*). A study portrait of the late Archbishop Benson is a very natural and unconventional bit of work. Some of the interiors at the Pharmaceutical Society's premises demonstrate the facility with which badly and unequally lighted subjects have been photographed, and the "latitude of exposure" is exemplified by two apparently similar views of a stained-glass window in Gray's Inn, one of which had a minute's exposure and the other fourteen hours. Both negatives were developed in the same solution, and the results are not distinguishable one from the other. Another example of prolonged exposure, yielding excellence of effect, is seen in No. 381 (*Entrance Lobby, Ironmongers' Hall*). This was exposed on from Saturday to Tuesday! Frame No. 446 contains six prints from plates exposed for one, two, four, eight, sixteen, thirty-two seconds respectively, developed together for the same time in the same dish, "illustrating the great latitude of the plates, and the practical impossibility of any one losing a negative through over-exposure." These six prints are practically uniform, and are qualitatively all that could be desired.

Besides Mr. Sandell's own work, there are contributions by Mr. J. F. Knights, Mr. Julius A. Kay, Dr. T. W. Morgan, Miss Arding, Mr. A. J. Sargeant, and Mr. G. W. Watson—all of a high order of excellence.

Most of the photographs are of comparatively large size, printed on gelatine paper, but some enlargements, on bromide paper, are included. For the 452 exhibits, some of the finest, the most varied, the most difficult architectural subjects in Europe were selected, and have been superbly photographed. The Exhibition is altogether most creditable to Mr. Sandell and his Company, and should be visited by all photographers having the opportunity.

Our Editorial Table.

The Stigmatic Lens (*f*-6).

J. H Dallmeyer, Limited, 25, Newman-street.

A BRIEF description of the form of the No. II. (*f*-6) series of Stigmatic lens has already been given in the JOURNAL (see page 171, March 12), and last week we published Mr. Dallmeyer's paper, recently read before the Royal Photographic Society, in which the principal features of the lens are fully set forth. Having been given the opportunity of subjecting one of the lenses to actual trial on the camera, we are enabled to pen the following notes on its practical performances.

Optical science, in the construction of modern photographic lenses, has a threefold problem to solve. This is, to provide objectives of large angular aperture, from which the errors of spherical aberration, curvature of field, and astigmatism have been eliminated. The first-named defect, which, practically considered, amounts to a general degradation of the image over the whole plane of definition, is one to which lenses of large angular aperture are conspicuously prone, and to destroy its effects, while at the same time reconciling the property of flatness of field with the power of the lens to transmit oblique pencils of light as perfectly as those which pass through its centre, is obviously a task which, if accomplished, renders the lens that has been thus corrected of singular value and efficiency.

The Stigmatic possesses the optical virtues named in a pre-eminent degree. A lens of six-and-a-half-inches focus perfectly covers, at full aperture, a plate whose base line equals eight inches, and thus its great covering power renders it useful for wide-angle purposes. The definition over the whole field we found to be extremely fine and uniform. At the aperture named the lens is easily focussed—a property we have hinted at in the preceding paragraph as not universally met with—and, so far as the camera test on vertical and horizontal lines was concerned, it is quite free from astigmatic errors. By decreasing the aperture to a small extent, the covering power of the lens is increased to a remarkable degree, while the illumination is singularly even. The front combination transposed to the back cell forms a useful single lens of about twice the focal length of the compound.

We may add, in conclusion, that the effective aperture (*f*-6) is calculated on the English system. It will be readily understood, from the particulars here given, that the Stigmatic is essentially a "universal" lens, that is, for the most rapid work, for copying, for landscape, architectural, and general purposes, it answers equally well, and therefore it is assured of high appreciation at the hands of all classes of photographers.

Beck's Film-developing Discs.

R. & J. Beck, 68, Cornhill.

THOSE who have experienced the peculiar sensation of attempting to develop several "cut," or rollable film negatives in one dish will appreciate these little discs, which are designed to keep the films



under the developer, and prevent them from slipping one over another. They consist of thin metal discs with corrugated centre pieces which may be attached to the corners of the films. The discs are so small, neat, and handy that a box of them should infallibly find a place in the amateur's dark room.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, April 27, at eight p.m., at 12 Hanover-square. A practical demonstration of Glass-blowing at the Lamp, by T. Bolas, F.I.C., F.C.S.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The Prize Camera for the current month has been awarded to Mr. W. J. Small, Fairholme, Spilsby-road, Boston, Lincolnshire, for his negative, *A Country Seat*.

ARCHITECTURAL POSTAL PHOTOGRAPHIC CLUB.—Mr. J. E. Underwood, Devonshire-square, Loughborough, writes: "This Club has now started with some excellent workers (including four medallists). I shall be very pleased to hear from any of your readers with a view to joining, who are interested in this branch of photography, accompanied by a specimen of their work."

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, April 28, at eight o'clock. Lantern Night. Subject: *Has the Quality of Lantern Slides Deteriorated? and, if so, to what may it be attributed?* With illustrations, ancient and modern. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

A VICTIM OF SCIENCE.—In a recent discussion on improvements in the X-ray apparatus, one of the speakers mentioned that he possessed a fluorescent screen measuring 6 × 1½ ft. It is intended to show the full-length figure all at one view, and, on an occasion when the apparatus was being inspected by a number of persons, it was the means of creating an embarrassment almost beyond the power of words to describe. A lady, having incautiously passed in the line of rays, was suddenly displayed on the large screen, and, as dress-materials are very transparent to the rays, her costume, of course, did not count for much in the picture.—*The Lancet*.

Patent News.

HE following applications for Patents were made between April 5 and pril 10, 1897 :—

GNETTES.—No. 8841. "Ground-glass Surface Photographic Printing Vignettes." W. H. EDWARDS.

LOUD NEGATIVES.—No. 8842. "Transfer Sky Negatives." W. H. EDWARDS.

IMATED PHOTOGRAPHY.—No. 9097. "Improved Means or Apparatus for Producing Animated or Kinetoscopic Pictorial Effects." W. FRIESE-GREENE.

OUNTING PRINTS.—No. 9120. "Improvements in Mounting Photographic Prints for the Production of Ornamental Articles and for Other Purposes." J. A. DE WITT.

EMBOSSED PHOTOGRAPHS.—No. 9171. "Improvements in Embossed or Relief Photographs and in the Art of producing the Same." D. F. HULBERT.

UTTERS.—No. 9195. "Improvements in Blind-shutters for Photographic Purposes." F. L. PERKEN, E. T. PERKEN, and A. RAYMENT.

LARGING APPARATUS.—No. 9217. "Improvements in Enlarging Apparatus for Photographic Purposes." L. GAUMONT.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
.....	West London	Excursion: Cheshunt, &c.
.....	Camera Club	Illustrated Counties: Surrey.
.....	North Middlesex	*Hand-camera Work.* W. Thomas.
.....	Richmond	Show of Apparatus.
.....	Stafford Y.M.C.A.	Readings from Photographic Authors, with Discussion.
.....	Bournemouth	Open Evening.
.....	Brixton and Clapham	Lantern Evening: Japanese Coloured Slides.
.....	Hackney	Sale and Exchange Night.
.....	Isle of Thanet	*How to Make a Hand Camera.* J. H. Forwalk.
.....	Munster	Closing of Annual Exhibition.
.....	Newcastle-on-Tyne	Discussion on Framing Photographs.
.....	Royal Photographic Society	A Practical Demonstration of Glass-blowing at the Lamp. T. Bolas, F.I.C., F.C.S.
.....	Camera Club	*Autocopying Process.* The Autocopyist Company.
.....	Leeds Camera Club	Annual Meeting.
.....	Leigh	Meeting to Arrange Competitions, &c.
.....	Leytonstone	Sale and Exchange.
.....	Photographic Club	Lantern Night: *Has the Quality of Lantern Slides Deteriorated? and, if so, to what may it be attributed?*
.....	Aston	*Practical Entomology.* W. J. Parker.
.....	Bradford Camera Club	*Intensification, Reduction, and Treatment of Negatives.* Mr. Cowbourn.
.....	Camera Club	*The Automatic Telephone.* S.B.Apostoloff.
.....	Goldsmiths' Institute	*The Developer and its Preservation.* W. H. Sidgwick.
.....	London and Provincial	Old Lantern-slide Show.
.....	Oldham	Exhibition of Members' Transparencies.
.....	West Surrey	Lecture.
.....	Croydon Microscopical	*The Himalayas.* Professor Norman Collie, F.R.S.
.....	West London	Technical Evening.
May.		
.....	Ashton-under-Lyne	Excursion: Knutsford.

ROYAL PHOTOGRAPHIC SOCIETY.

ril 13,—Ordinary Meeting,—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-sident), in the chair.

ight new members were elected, and it was announced that the following eties had been admitted to affiliation :—Newcastle-upon-Tyne and Northern unties Photographic Association, and Bradford Photographic Society.

COLOUR MEASUREMENT IN PHOTOGRAPHY.

Mr. C. F. TOWNSEND, F.C.S., read a paper upon this subject, with the object bringing before the Society the necessity of definite colour measurement in rly every department of photography, and of suggesting points for future estigation. He had hoped to have included the results of research on ilar lines to the work of Messrs. Hurter & Driffield, as he wished to com- e the influence of different factors in development on the colour and ting value of a negative as well as on the density or deposit of silver. en the strips were read, however, an unexpected source of error presented lf, it being found that the newly developed negatives darkened on exposure ght; he was now investigating this subject, and would submit his results future occasion. Having alluded to the need of standards for the different erials in general use by photographers, including isochromatic screens, light sitisers for isochromatic plates, glass and fabrics for dark-room illumination, t filters and printing inks for three-colour work, &c., and, having pointed the essential features of the spectroscope, Maxwell's colour box, the ur top, spectro-photometers containing Nicol prisms, Captain Abney's ur-patch apparatus, and Mr. J. W. Lovibond's tintometer, the lecturer ceeded to describe in detail the results of his examination of a number of erials, showing tables of readings obtained by means of the spectroscope and the tintometer. Thirty specimens of media for dark-room illumination were found to vary enormously, both in quality and quantity of their absorptive power, and were all of an unsatisfactory character. The ordinary worker was entirely in the hands of the dealer in purchasing his materials, and there were no proper definitions as to what constituted a particular colour either visually or spectroscopically, and he suggested that the whole question should be considered by a permanent Standards Committee of the Society. A definite standard had been fixed for lens flanges and diaphragms, and why should not this rational procedure be extended to other departments? It would be a great advantage in carbon printing, enlarging, and process work if, instead of employing an actinometer, it was sufficient to read the density and colour of a negative by glasses similar to the tintometer glasses, and to deduce from that by some easy rule the exposure required. He was not sure whether this was practicable at the present time, but there appeared to be no great difficulty in the way. The influence of the colour of the negative on the colour of the print, the action of different gold toning baths, and the toning or staining of platinum and bromide prints by uranium salts and organic substances, were suggested as useful subjects for investigation, together with the examination of the colour of the glasses of photographic lenses, especially those which had been in use for a considerable time, as it was possible that the specific absorption of a lens might have an influence on the isochromatism of the negative. An examination of ten isochromatic screens showed wide variations in character, even, in some instances, in different parts of the same screen; and some astonishing differences were observed between ostensibly identical sets of light filters for three-colour work, both by the same maker, but one of which was new and the other old. With regard to light filters, the method presenting the greatest possibilities of success was the employment of cells filled with solutions of suitable dyes, standardised, and renewed at short intervals. Many people were under the impression that the laws governing the absorption of light by materials like a photographic negative, in which there were more or less absolutely opaque particles on a transparent ground, applied also to coloured solutions, but this was not by any means the case. Of three sets of trichromatic printing ink, the blues were found upon examination to contain a large proportion of black, which would account for the dull appearance of three-colour prints. Referring to the difficulty often experienced in obtaining mounts of a particular tint, varying colours being sold under one name, Mr. Townsend suggested that the Standards Committee should consider the possibility of formulating a rational system of colour nomenclature for application to all coloured materials.

Mr. J. CADETT criticised the tintometer on the ground that the application of arbitrary numbers to different glasses did not convey to one's mind any idea of what had taken place with regard to absorption; but the instrument would be very valuable if its clever inventor would devise a means of giving the percentage absorption, measured photometrically, of the glasses. Thanks were due to Mr. Townsend for bringing up the question of standards, for the whole matter of orthochromatic screens and plates was in a most disgraceful condition, *e.g.*, the tables prepared by the lecturer showed that the screens upon the market varied very much in what could be seen, but how did they vary with regard to those rays which were not seen? A yellow screen was used to cut the blue or violet, but one saw nothing of what violet did pass, and it was quite possible to have a screen which even photometrically would appear satisfactory, and yet might allow an enormous amount of violet to pass.

Mr. F. E. IVES entirely agreed that it was the unseen rather than the seen that required measurement in colour screens. The differences indicated by Mr. Townsend's measurements were, in his opinion, of infinitely less importance in practice than the question of the transmission of ultra-violet rays, which the tintometer would not show. With regard to the fading of colour screens, he remarked that eosine, cyanine, and fuchsine, which were very fugitive in fabrics, appeared to be absolutely permanent in gelatine or collodion sealed-up screens.

Mr. E. J. WALL regarded the tintometer as a very pretty instrument, and said that, if Mr. Cadett spent an hour in examining it, he would understand and appreciate it. If the light passed through the spectroscope and the tintometer were of the same intensity, he had no doubt it would be found that the results were identical.

Mr. J. W. LOVIBOND, the inventor of the tintometer, repeated that the same light would yield similar results, but it was impossible to get concordant readings in the tables submitted by Mr. Townsend, because the glasses were measured by diffused daylight, while the spectroscopic measurements were made by a paraffin light of thirty candle power one foot from the screen. As to Mr. Cadett's remarks with reference to the "arbitrary numbers" of the scale, the numbers were applied upon a strictly scientific basis, and, if the glasses were destroyed to-morrow, they could be exactly reproduced. Mr. Lovibond also answered some of the other points which had been raised with regard to his instrument, and, after further discussion by Messrs. Ferguson, Snowden Ward, and the Chairman, Mr. TOWNSEND replied, and the proceedings closed with a vote of thanks to him.

PHOTOGRAPHIC CLUB.

APRIL 6,—Mr. Hans Müller in the chair.

Mr. W. Thomas was proposed as a member of the Club.

Museum Night,—Mr. FOXLEE gave an interesting description of some of the apparatus and objects of interest in

THE CLUB MUSEUM.

Amongst the items were some curiously tinted photographs presented by Sir Thomas Parkyn. These, said Mr. Foxlee, were probably chromotype (carbon) prints, which had been developed upon a collodion coloured with some dye. A series of moulds made in Spence's metal: The preparation was probably similar to the preparation of an intaglio plate, but the etching was much deeper, and was effected by carbon bisulphide. An early Warnerke screen: Mr. Tottem fixed the period as just before the commercial issue. An interesting example of Lambertype, made by the inventor of the process, and

also a Daguerreotype (period, about 1839), made before the discovery of Fizeau's gold toning method: This photograph is believed to have been produced by Daguerre himself. At this point Mr. Foxlee gave an account of the proper method of cleaning tarnished Daguerreotypes. The method is: First flood the plate with alcohol, then wash under the tap until the water flows quite evenly over the surface. Next apply a weak solution of cyanide of potassium to the image, and rock the plate gently until the tarnish and discolouration go. If a continued application is ineffectual, the strength of the cyanide must be increased. Afterwards wash the plate, first under the tap and finally in distilled water. The plate must be dried by heat over a spirit lamp, and it is important that no check should take place during the evaporation, or an ineradicable stain would ensue. It was pointed out that Daguerreotypes do not fade, but that a tarnish creeps over the plate. This tarnish can only be removed in the method indicated. On no account must any friction be applied to the surface, nor must it be dusted with a brush. The least touch damages the surface of the film. Sometimes defects, apparently due to the Daguerreotype itself, are really only a change in, or a deposit of moisture upon, the cover glass. In this case the remedy is obvious. A number of calotype negatives were shown, and also the unique collection of ceramic enamels, the property of the Club, given by Messrs. Haes and Cowan, and bound by Mr. Zaehnsdorf. These enamels, some made by Camarsac and others by Joubert, are in a state of perfect preservation, and represent the perfection point to which this admirable process had reached a generation since. Of apparatus an interesting example is an old camera front, made for the late T. R. Williams in the year 1865. This had a device for enabling the lens to be placed in any position in the camera front, and it is possibly the antitype of a number of inventions, the fees for securing the patent rights of which have helped to augment the national exchequer. Amongst other interesting apparatus were examples of Scotellari's exposure accelerators (depending upon the use of a supplementary exposure for their efficiency), Daguerreotype apparatus, and a series of twenty photographs of Turner's pictures (published about the year 1875).

Mr. Haes promised to add some further apparatus, and a member undertook to make a cabinet to hold some of these articles if the Club provided the wood.

Mr. Foxlee was cordially thanked for his interesting and useful descriptions

Brixton and Clapham Camera Club.—April 6.—Mr. BULLEN addressed the members on

FILM PHOTOGRAPHY,

particularly in reference to the "anti-celluloid" films recently introduced by his firm, the Gem Dry Plate Company. After an account of various substances other than glass which have been tried as a support for the sensitive coating, and an interesting exhibition of many specimens by these early methods, he referred to celluloid films, which cannot be regarded as a perfect substitute for glass plates, as they possess the drawbacks of increased cost, curling in development, and bad keeping quality, due to chemical action in the celluloid. The new A C films have none of these faults—the cost is no more than plates of good quality, development is easy, and, the base being gelatine, no chemical action occurs between the film and the sensitive emulsion with which it is coated. They also give negatives free from halation, a by no means unimportant advantage. In sizes above quarter-plate a carrier is necessary to keep the film flat when using in the ordinary dark slide. Any good developer can be used, but it is important that the developer be *first* poured into the dish, and *then* the film immersed in it, otherwise the film will probably stick to the bottom of the dish, as may be expected when it is remembered that the film consists of gelatine. After fixing, the negative requires half an hour's washing in running water, and then soaking for two or three minutes in a five per cent. solution of glycerine in water, and, without further rinsing, pinned up to dry. After this is done, it is advisable to varnish by dipping in a cold drying varnish. Provided the glycerine bath has not been omitted, or the negative dried by heat, it will then be perfectly flat. The result of the recent members' lantern-slide competition was Mr. R. Fisher, jun., first; Mr. Lovegrove second.

Leytonstone Camera Club.—April 7, the President (Dr. Turner) in the chair.—Mr. F. O. BYNOE (R. & J. Beck, Limited) gave a lecture upon

INSTANTANEOUS PHOTOGRAPHY,

the various points of which being its attractiveness as a pastime; its utility as a study; the most suitable apparatus for its application; the advantages of the use of films; some of the difficulties encountered in producing a satisfactory automatic film, changing at once without the use of sheaths; the Frena system; the value of the swing back for hand cameras; the theory of the swing back, and its comparison with the rising front; the advantages of the use of the fixed focus lens for hand cameras. The lecture was a very careful *résumé* of the subject in hand. Various forms of shutters for instantaneous work were shown, and their advantages and disadvantages pointed out. The question of plates *versus* films was fully discussed, and left little room for doubt of the advantages of films for this class of work. The lecture, which had been most ably and eloquently rendered, was considerably enhanced by means of a good show of apparatus, and the varying points clearly demonstrated with blackboard diagrams and lantern slides, among which were some mechanical slides, showing the effect of varying foci lenses and the effect of stopping down the lens when the swing back was used. After answering a number of questions, the latter part of the programme was devoted to the exhibition of a number of lantern slides taken with the Frena hand camera, which fully testified to the excellence of work done with it. A most cordial vote of thanks to Mr. Bynoe concluded a most instructive and enjoyable evening.

North Middlesex Photographic Society.—April 5, Mr. H. Stuart in the chair.—Mr. MATTOCKS gave an account of the outing to Whips Cross, on April 3. He said that it was spoilt, for photographic purposes, as a lot of the water had been drained off; the weather was rather dull, but an enjoya outing was spent. The Secretary showed a couple of setoloid films which been sent as a sample; they kept quite flat during development, and gave image of good quality. The support is not so transparent as celluloid, partakes of the same qualities. Mr. GOLDING described a sepia-sensiti paper, used by engineers for plans, &c., which answered very well if used w an ordinary negative, and several members said they would try it.

APRIL 12, Mr. Cox in the chair.—Mr. G. H. Welland was nominated membership, and Messrs. J. H. Avery and F. W. Meise were elected. A. MACKIE then gave a demonstration on

COLLODIO-BROMIDE EMULSION.

He described the whole process, from cleaning the glass to developing plate. He coated some plates with emulsion, and afterwards exposed a developed a slide, and showed the result in the lantern. The most import part of the process is the use of a suitable pyroxyline, and mineral methylated spirits will not do. He made a batch of emulsion according the following formula: 60 grains pyroxyline in 2 ounces ether and 2 oun alcohol, 65 grains bromide of ammonium in 90 minims of water, to which a 1 ounce alcohol, and mix with pyroxyline solution. Dissolve 100 grains sil nitrate in 50 minims water, add alcohol 1 ounce, and add to bromi collodion. This should be kept twelve hours, poured into a dish for solve to evaporate and washed, and redissolved in 8 ounces mixed alcohol a ether. A number of slides by this process were then shown on the screen.

Bath Photographic Society.—April 7, Mr. Geo. F. Powell (President) the chair.—There was a large attendance of visitors, attracted by the announ ment that Mrs. Shaw-Phillips had kindly promised to give an illustrat lecture on

PERSIA AND BURMAH.

Commencing with Persia, Mrs. Shaw-Phillips gave some information regardi its geographical importance, its magnitude, and its antiquity. Then slid illustrating scenes met with in daily life, were shown on the screen by mes of the Society's lantern. The series, being rare and well executed, evoked bo interest and applause. Mrs. Shaw-Phillips's description of each slide v lucid and instructive, especially concerning the ancient kingdom of Camby and Cyrus. The audience could view the ruins of cities and palaces bu 3000 years ago, now the haunts of the lion and the panther, and they co watch the proceedings of a native bazaar to-day. The national failing, lecturer said, was delay, everything would do better to-morow. Burmah w next dealt with, showing its wide rivers, dense jungles, and cities, with gild pagodas, resembling the styles in vogue in China and Japan. Portraits of inhabitants were shown, including graceful women, who were not shut up despised as in India or China and some other Eastern countries, but had th liberty as in England, and being, furthermore, not only clever enough manage household duties, but their husband and their business. Passing fr Burmah into India, the lecturer said she would show a few of her Indi pictures by special request. These were still more beautiful than the previ slides, including, as they did, many cities, temples, and mountains, the cen of attraction being the sacred city of Benares. A brief stay at Aden brou the lecture to a close. Mr. M. H. SCOTT, who had taken the chair at the co mencement of the lecture, cordially expressed the thanks of the Society Mrs. Shaw-Phillips for her splendid lecture, a remark which was warm applauded.

Leeds Photographic Society.—

LANTERN-SLIDE MAKING

was Mr. J. H. WALKER'S subject at the April meeting, held in the Societ room, at the Leeds Institute of Science, Art, and Literature. Mr. WALK commenced by informing his audience that a lantern slide is a transparency inches square, the pictures usually being matted out in oblong, square, round form, the last-mentioned being chiefly of use in case of diagra Contact printing he described as of good use occasionally, but rejected it ge rally as a clumsy and wasteful way of attempting to produce pictures, advised the composing of the picture on the focussing screen as the pho grapher wished it to be, adding that, although more trouble, it repaid in finished transparency. He used quarter-plate chiefly, on account of portability and being nearest to the size of a lantern plate. Referring to style and size of negative, he stated there was an idea that better res could be got by reduction from half-plate or whole-plate; but his convic was that no finer image could be got from larger sizes if a fine lens accurate focussing were used with the quarter-plate instrument. The nega must be well gradated, free from opacity in any part—not one with an im built as high as Babel and as dense as the builders, requiring a 16,0 candle power for its illumination. In a conversation with Mr. Birt Ac that gentleman advised backing plates, and, after adopting this method, result was as predicted—eleven good transparencies out of each dozen pla exposed. With respect to plates, he had no particular fancy for any special bra but had used Thomas's lately. The merits of various developers introduced the market during the last seven years were discussed at the close of lecture, and those members who intended following in Mr. Walker's st this season were advised to confine their attention to one make of pla and its suitable developer until thoroughly acquainted with its capabiliti A selection of sixty slides was shown by means of the lime light, illustrat the most interesting points of the lecture, many of them being thorou appreciated by the antiquarian section of the Society. A hearty vote thanks was proposed by Mr. J. W. Addyman, seconded by the Rev. J. Merry, and carried with acclamation. The President (Mr. P. Gilston) p sented medals to the successful competitors in the Society's Exhibition, v —Mr. Godfrey Bingley, silver medal, for set of six lantern slides; Mr. C. R. Pickard, silver medal, for enlargement; Mr. W. Denham, bronze medal, set of six lantern slides; Mr. A. A. Pearson, bronze medal, for silver pri In consequence of the Easter holidays, the next meeting will not be held May 6, when Mr. B. A. Burrell, F.I.C., will deal with "Weights Measures."

FORTHCOMING EXHIBITION.

1897.
ril 23–May 1 .....*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.

* There will be an Open Class.

Correspondence.

** Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

CALCIUM CARBIDE AND THE LONDON COUNTY COUNCIL.

To the EDITORS.

GENTLEMEN,—The imposing list of regulations issued on April 1 by L.C.C., call, I think, for some comment from those who have used tylene gas and learned to appreciate it. The amateur photographer lanternist who buys an occasional pound of carbide now finds himself led upon to pay five shillings a year for a licence. The refusal of the me Office to allow the exemption clause of the Petroleum Act to be y applied to calcium carbide is not only unjust, but shows a great t of practical knowledge of the material. It gives off acetylene freely en immersed in water, but, when in contact with moist atmosphere, the eration is much too slow to be dangerous, and the startling notices ch now have to be placed on the packages containing it are in a great sure uncalled for. There are other points about these rules which certainly peculiar—a licence will only be granted for carbide which is e. How is the ordinary user to judge its purity? No lights or fires to be allowed near a place where a generator is situated! This is dmotherly caution with a vengeance, and is absurd into the bargain. ere seems to be little doubt that acetylene, stored under high pressure n a liquid state, is dangerous, and its use under these conditions should orbidden. The best form of generator is one of the automatic type, the gasometer principle, hundreds of which are in use all over the kdom. One of these, when fitted with a condensing chamber and e simple arrangement for getting air out of the gas-holder at starting, a means of escape for the gas in case of over-accumulation, is fectly safe. A pressure of four inches of water in an apparatus of this l is quite sufficient, whether for illuminating a magic lantern or a rch. If the L.C.C. had laid greater stress on the dangers of generators ch work under high pressure instead of giving so much advice as to storage of carbide, their regulations would have been of vastly more ice as regards the public safety.—I am, yours, &c., C. H.

FRENCH CHALK.

To the EDITORS.

ENTLEMEN,—If you have not quite exhausted this subject, I should to say that French chalk and talc are not quite the same thing, er in their physical or chemical composition. Both of them are ates of magnesia, but not chemically alike.

French chalk is ..... $3MgO4SiO_2$.
Talc is ..... $4MgO5SiO_2$.

r photographic purposes this difference in chemical composition t not signify, but, whereas talc in powder consists of minute scales, ch chalk is less scaly and more powdery, and therefore, possibly, r for dusting on to glass than talc. Personally I use French chalk, ough really I do not think it makes much difference which is used. close you a sample of each, for microscopic or other comparison, h I obtained from one of the largest wholesale drug houses in lon.—I am, yours, &c., J. H. BALDOCK, F.C.S.

. Leonard's-road, Croydon.

PRICES.

To the EDITORS.

NTLEMEN,—I have received this morning by post an intimation, hed in very curt terms, from the house that supplies me with P.O.P., henceforth, instead of paying 12*s.* 6*d.* per quire, I must pay 15*s.* ther words, while photographers have been asleep, manufacturers been very much awake.

at it serves us right there can be no question. As far as I am con- d, the remedy is obvious. I intend to get my P.O.P. from a German e, and for plates I intend to send to a well-known house which lies a first-class plate at 2*s.* per dozen for half-plates, and allows y per cent. on a 5*l.* order.—I am, yours, &c.,

ster Monday. AN OLD PROFESSIONAL.

THE POSITION OF PROFESSIONAL PHOTOGRAPHY.

To the EDITORS.

ENTLEMEN,—I think the profession is greatly indebted to Mr. has Fall for his outspoken and refreshing letter on the above ct, and, whilst speaking of "touting," the letter of "A Country Photographer," referred to by Mr. F., has thrown a little light on the manner in which I have been treated by a certain firm, who annually call on the leading colleges and schools. The grievance to me is all the more keen, seeing that the same firm has come into this city annually for some time, and taken large school groups of a college where my own nephew and boys have been educated for the last twenty years, and thus supported by me. On my remonstrating with the head master, I was told he was free to go where he pleased, and as they had called on him, and I would not tout, I lost the orders for large groups; but when it suited his purpose, and the firm was not on tour, I was invariably engaged to take football groups, &c.—the sale of copies would necessarily be small—whereas the whole school job went to foreigners. Of course he was free, and so I have been since, by removing my son, and putting another boy elsewhere to be taught. I think, however, the free sitting to the head master, referred to in copy of circular, solves the question somewhat.—I am, yours, &c., F. A.

April 17, 1897.

THE FIRST PHOTOGRAPHIC USE OF THE TERM HALATION.

To the EDITORS.

GENTLEMEN,—Once more, in the interest of truth as Mr. T. Taylor's successor, you would do well to be familiar with the subject of halation, its birth, death, and resurrection. I have sent to Dr. Murray all the information he asks for in reference to the above heading as far as I am able, and that goes as far back as the January number of the *Journal* of the Photographic Society, 1861. According to this, 1881 is twenty years behind this date (1861). Since 1861 I have written a number of articles on this fault, and also concerning the family of halos. You will find most of them in the back numbers of your valuable paper. My original paper on the subject was printed in the *Journal* of the Photographic Society, April 15, 1861, and in THE BRITISH JOURNAL OF PHOTOGRAPHY at the same time. You will find a reply to various objections in the June number of the *Journal* of the Photographic Society. Others have appeared in the late *Illustrated Photographer*, &c. If you care to be troubled with this matter, I shall be pleased to give you the whole of the details of the references in my possession, and goodness knows how many more "original discoveries," &c., could be found in the interval between 1861 and 1897.—I am, yours, &c., G. MARLOW.

68, *Lower Sutton-street, Aston-road, Birmingham, April* 13, 1897.

"A LOST ART."

To the EDITORS.

GENTLEMEN,—Referring to a paragraph in this week's JOURNAL, "Why has photographic painting become a 'lost art?'" Because it has been killed by cheap and bad work that has flooded the market, and also the public found what they thought "a thing of beauty and a joy for ever" soon passed into nothingness.

Before the days of "retouching," photographers looked to trained artists to rectify the exaggerations of the camera, either by colour or finishing in black and white; and in those days, before mechanical processes, air brushes, and other dodges, that simply spell the word *cheapness*, there were artists to undertake it. In those days photographers could not so well stand alone, and looked to the artist to help them, and laid themselves out for painted work. In those days artists were provided with proper painting rooms, sittings were given, lay figures were provided for draperies, and the whole idea was carried out with the feelings and requirements of an artist wishful to produce really artistic work, and in those times a fair price was paid, either by salary or piece work.

In the present day the price-lists have only to be looked at to show the impossibility of really good work being produced at the prices quoted. There are, doubtless, artists still competent and willing to undertake the painting of photographs quite equal to those of former years, and the public may now look to the painting that they have paid a fair price for not passing away; but, to quote one of your correspondent's remarks in a letter in last week's JOURNAL, "it is not simply for the time taken to produce, but for the forty years' experience that the artist expects to be paid."—I am, yours, &c., A. O.

April 19, 1897.

EDINBURGH EXHIBITION, 1897.

To the EDITORS.

GENTLEMEN,—Is it not strange that the Judges at the above Exhibition have awarded all their medals to local men? It seems, from looking at the catalogue, that none of the photographs are worthy of recognition except those produced by Scotchmen. It is significant that all the Judges are of the same nationality, and possibly looked sincerely upon their brethren. Taking into account the expense of carriage charges for wall spaces, &c., workers on this side of the Tweed will not trouble them much in the future, I fancy, if they are to be ignored as in the present Exhibition. Thanking you for inserting this in your paper,—I am, yours, &c., FAIR PLAY.

THE BRUSSELS INTERNATIONAL EXHIBITION, 1897.

British Section.

To the Editors.

Gentlemen,—In August last, you rendered great assistance to the British section of the Brussels Exhibition by publishing a letter, in which I called the attention of our manufacturers to the importance it then appeared probable the Exhibition would assume, and asked them to consider carefully whether it would not be of sufficient interest for them to participate. I venture to trouble you with a second letter, now that I am in a position to state positively what are the actual prospects of the British Section, to the success of which your co-operation last summer has materially assisted. Commencing with a court of 30,000 square feet, the applications from manufacturers have rendered it necessary, on several occasions, to obtain more space from the Exhibition authorities, until to-day the commercial courts of the British section occupy no less than 70,000 square feet, besides some thousands of feet in the machinery hall, and a series of fine arts courts, which it is confidently anticipated will be in all respects worthily representative of British contemporary art. It may, therefore, now be stated that, as regards its extent, the British section at the Brussels Exhibition will leave little to be desired. It will be much smaller than the French section, which has had the advantage of a very large Government grant; on the other hand, it will be far more extensive than that of any other foreign country. I cannot claim for the industrial courts that they will contain exhibits of a very novel or monumental character; but they will be filled with contributions from exhibitors of high standing, and distinctly representative in their various branches of industry. Therefore, as regards quality of exhibits, as well as extent of space occupied, this country will be well represented. It is evident that this result could not have been obtained without united and continuous efforts on the part of the British commission, and its President, Sir Albert Kaye Rollit, and especially of the executive committee; while the undoubted success of the fine arts section is due to Sir Edward Poynter and the members of his sub-committee, who have laboured under very difficult and discouraging conditions.

In my capacity of Executive Commissioner to the British section, I would like to take this opportunity of thanking all our numerous exhibitors for their universal consideration and thoughtful co-operation with me, and to bear witness to the admirable spirit of friendliness and accord that animates them, and will continue, I doubt not, to do so till the end.—I am, yours, &c.,

James Dredge,
Hon. Executive Commissioner.

35, 36, *Bedford-street, Strand, London, W.C., April* 10, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photograph Registered:—

William Edward Jay, 8, Minnie-street, Wolesley-road, Leeds.—*Photograph of Robert Walton, of the Yorkshire County cricket and football team, seated.*

A. O.—Thanks; we had seen the paragraph referred to.

Rev. L. Macdona.—We forwarded your communications to the gentleman named.

Ignorant.—1. Send our publishers one shilling and sevenpence and three copies of the photograph, and they will effect registration. 2. The owner cannot interfere with you.

F. E. G.—Yes, you are liable, and the penalties, on the trial of the action, might be considerable. We should advise you not to run any further risks. See the Act printed in the 1897 Almanac.

Portraiture.—Amateur. The portraits sent are, as you suggest, not successful. The faces are flat and map-like, and quite devoid of *chiaroscuro*. This is due to too much front light. Stop off the direct front light and use more side light.

Non-Return of Specimens.—R. W. J. Write to the superintendent of police of the district, and do so without delay. You were unwise to send specimens to an applicant who only gave a *nom-de-plume* and a post-office as an address.

Bankruptcy.—Operator. As an *employé* you are entitled to your arrears of salary in full, but, we think, only to a limit. If you have been a yearly servant, paid quarterly, we fancy you cannot claim more than a quarter's arrears in full; if paid monthly, only a month's. For any greater arrears we imagine that you will have to rank with the other creditors.

Copyright.—W. G. C. You have, we are sorry to say, no remedy. Although you bought the business, and all the copyright negatives, you have no copyright in them unless the copyright in each was legally assigned to you, and that does not appear to have been done. Although the negatives are your property, the copyright is still vested in your predecessor in the business.

Blackening Stops.—Diaphragms asks: "Can you please tell me how to stain diaphragms of lens dead black? I find varnish will not do, as it soon chips off."—There are several ways of doing this. Perhaps the simplest is to thoroughly clean the brass, then slightly warm, and plunge in a dilute solution of bichloride of platinum. When blackened rinse in water, and dry by heat.

Double Image.—Puzzled. There is really no mystery in the matter. The plate has been exposed twice on different objects, and, what is more, the plate has been reversed between the two exposures, the foreground in the one appearing in the sky of the other. Probably you will be attempting to develop another plate that has not been exposed at all—a mistake in changing the plates evidently.

Shutter Blind.—W. F. K. says: "Will you oblige me by stating what is the best medium to use for stopping pinholes in Thornton-Pickard shutter?" We should say that, if there are pinholes in the blind, the best thing will be to replace it with a new one. This the makers will, doubtless, supply the material for; or send the shutter direct to the makers to do the needful. Any patches on the fabric would doubly impede its free working.

Frosting Glass of Studio.—R. Brett writes: "Last year you were good enough to advise me to stipple over the glass in the studio with a mixture of starch paste and whiting to keep out the direct sunlight, and it answered perfectly; but now the starch seems to have perished, and now ask you if you can tell me of anything I can do to prevent it flaking off?"—No; the only thing to do is to clean off the old coating—it will now easily wash off—and apply a new one as before.

Blinds.—C. E. R. says: "I have just had the roof blinds of my studio washed, and, although they have been both mangled and ironed, they will not run smoothly on the rollers. They bag when unrolled, and pucker and crease when rolled up. What can I do to remedy this?"—This is a very general fault with washed blinds. It is always more economical to replace dirty blinds with new ones, and then use up the old ones for dusters, and suchlike purposes.

Art Training.—Anxious writes as follows: "I should be glad if you will advise me what subjects (photographic) you would recommend for a girl with taste for drawing to take up; also if a course of training at a technical school would be to her advantage before apprenticing. If you will kindly give me your opinion, you will oblige me very much."—Retouching or finishing pictures either in monochrome or colour. Art training in a technical school would certainly be an advantage before apprenticing.

Colouring.—Princess Peace asks: "Can you give me any information as to what is used as a medium in tinting photographs in water colour and oils? Some one told me that powdered pumice stone was rubbed over the surface, but I should like to be certain."—Different colourists prepare the surface of the prints (when they require any preparation at all) in different ways. Albumen prints are generally prepared by a lick of the tongue or a thin wash of ox-gall. Bromide prints may be rubbed over with an ink eraser, or with pumice or cuttle-fish powder, to slightly abrade the surface.

Mounting Large Prints.—T. Alford says: "I have an enlarged negative, 18 × 15, from which I have made some carbon prints, but I cannot succeed well with the mounting of them. With silver prints, small size, I get on very well, using gelatine, but with the large carbon prints I cannot get the whole evenly coated with the mountant before it sets. I prefer to use gelatine, because it is said to be more inert on the picture than anything else."—Use starch paste instead of the gelatine. The carbon image is different from the silver image, and starch is quite as safe with carbon as any other mountant, and it is much easier of application than gelatine with large sizes.

Purchase of Business.—W. W. W. says: "As I am about to buy a small photographic establishment, I should be glad to know the following: 1. In buying the premises, would that include the goodwill or business, or would that be considered an extra advantage? 2. If I add a photo engraving department, could I make it pay at commencement? 3. Where can I obtain a really practical book on 'How to Buy a Business?'"—In reply: 1. That would be a matter of agreement. The premises might not be worth much if the seller took the business somewhere else in the neighbourhood. 2. Yes, if you have a connexion in that branch of photography. 3. We cannot say. We never heard of such a work.

Studio and the Building Laws.—Annoyed writes: "You were kind enough to give me some information about a studio I am building, for which I thank you. I learn now through the builder that the District Surveyor will not allow me to have wood or iron sides, but must glass *both* sides, or make south side brickwork (the studio is being built on top of a brick building which is about twelve feet high). Will you kindly say if this is correct; and, if so, which would you advise me to do and which would be cheapest?"—What your builder says is probably correct, because he will be conversant with the bye-laws of the local authorities. The builder would give you an estimate for either the two sides glass or the south side brickwork and the other glass. No doubt all glass will be the cheapest, but the south side brick will be the more substantial, and probably make the most comfortable studio to work in.

*** Several answers to correspondents unavoidably held over.

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EX CATHEDRÂ.

Paul's Animatographe, Limited, is the title of a new Company that was brought out last week. The subscription list closed on Wednesday, April 28, with what result we, of course, are unable to say. The capital is 60,000*l.*, in 15,000 ordinary shares of 1*l.* each, and 45,000 7 per cent. cumulative preference shares of 1*l.* each, the latter being offered for public subscription. The prospectus states that the Company has been formed for the purpose of acquiring the inventions and patent rights, together with Paul's Animatographe or Theatographe, "which is causing such wide-spread sensation by the display of animated photographs in the principal places of amusement," and to develop the resources of the invention and extend its present lucrative field of operation in various ways, notably in the directions of animated advertisements and animated portraiture. The business will be taken over as a going concern, and "its enormously profitable nature is proved by the fact that, even during the first year, *i.e.*, March 2, 1896, to March 17, 1897, in spite of initial expenses and difficulties of manufacture, which have now been overcome, it has yielded a net profit of 12,838*l.* 15*s.* 4*d.* on a capital of about 1000*l.*, or 1200*l.* per cent."

The prospectus adds that the Company's business will include the following branches: "1. The Manufacture and Sale of Animatographes and Accessories. The net profit on this branch during the period, March 2, 1896, to March 17, 1897, amounted to 6585*l.* 8*s.* 6*d.*, notwithstanding the small capital employed and the initial expenses necessarily incurred in bringing out a new invention and establishing a new industry. 2. The Manufacture and Sale of Animated Portraits of Individuals (*sic*). This great and taking novelty, produced at small cost, preserves for all time, and in a portable and convenient form, records of the natural movements of individuals. It is intended to open studios in London and the principal provincial towns, for the purpose of taking these portraits of the general public, and to license country photographers to take negatives, to be printed in the Company's factory. The profits of this branch alone are estimated to produce a handsome return. 3. Animated Advertisements. One of the most striking results of Mr. Paul's inventions, and probably the most profitable, is the production of an animated advertisement, adaptable to any trade, and showing processes of manufacture or use of any commodity in lifelike operation. Suitable stations for such advertisements are available at moderate cost, and several different advertisements may be shown at each station. The novelty and attractiveness of such advertisements will probably cause them to supersede all other illuminated devices. Several prominent advertisers are negotiating for such advertisements on extremely remunerative terms. Starting on a basis of only thirty advertisers at 3*l.* each per week for each station, each advertiser taking an average of five positions, this branch alone would produce an income of 23,600*l.* per annum, which would give, after a most liberal allowance for all expenses and contingencies, an estimated annual profit of about 15,000*l.* per annum."

* * *

The purchase price of the business is 25,000*l.* cash, and the whole of the 15,000 fully paid ordinary shares, which will not be entitled to rank for any dividend until seven per cent. has been paid on the preference shares. After payment of the 7 per cent. dividend on the preference and ordinary shares, half the surplus profits will be divided *pro ratâ* amongst the preference shareholders, and the balance amongst the ordinary shareholders. The above extracts are interesting as showing the rapid development of animated photography from the financial point of view. The prospectus, as such, hardly falls

within our sphere of criticism, the more especially as the subscription list has closed, and the financial and general press have already dealt with the matter in a very discriminating manner.

* * *

THE *Dome* is the name of a new artistic quarterly, the first number of which is now ready. It is printed on antique wove paper; has a story, a play, poems, and music among its contents, which are also to include "examples of all the arts." It is therefore a most superior publication. A feature is made of the fact that among the illustrations no reproductions of photographs will be found; nevertheless, of the five separately printed plates that are given, one is a photogravure. We view our contemporary's exclusion of photography from a place among "all the arts" with some amount of fortitude.

* * *

THOSE of our readers who are interested in the subject of photography in colours and are desirous of consulting the records of experimental work in that direction will, doubtless, find considerable use for the last number of the *Journal of the Society of Arts* (April 23, 1897) to which Mr. Bolas has contributed a bibliography of photography in colours, commencing with the year 1810 and coming down to the present time. The record, which gives references to the writings of Nièpce, Herschel, Hunt, Becquerel, Ducos du Hauron, and many modern experimentalists, must not, Mr. Bolas states, be regarded as even approximating to completeness, but it may serve as a beginning to which others may add, and thus become the basis of a tolerably exhaustive index to what has been published. We regard Mr. Bolas's compilation as distinctly valuable and well timed.

* * *

PHOTOGRAPHY, it appears, is being made the instrument of perpetrating an ingenious swindle in connexion with the Commemoration festivities. The *modus operandi*, says a contemporary, is to photograph a prominent house along the line of route, and forward the same to rich Americans and others as they arrive in London, quoting a low price for windows, and asking for a deposit if the site suits. In one case 170 guineas was received for a set of windows. The result of inquiries, after the deposit is paid, is that the house and windows photographed do not belong to the vendors at all, and these gentlemen are never heard of again.

* * *

IN the course of an article, on "The Evolution of Half-tone Engraving," which appears in a recently published number of the *Artist*, Mr. William H. Ward, a high authority, has some pertinent remarks on the subject of the printing of half-tone blocks in America and in this country. "The American magazines," he points out, "which had become conspicuous for the exquisite fineness of their engravings on wood, have become even more remarkable for the perfection of their half-tone illustrations. But their superiority to the magazines of other countries in this respect," he adds, "is not due alone to the perfection of their engravings. Early in the evolution of the half-tone, the New York printers discovered that, to obtain at the press the full effect of the extreme fineness of detail in the new half-tone, new conditions of printing must be fulfilled. The old traditions of printing on damp paper with the blanketed cylinder had to be abandoned, and a special paper produced to suit the new kind of illustration. The woodcut was as easily printed as type, both being deeply cut, but the 'depth' of the perfected half-tone is not appreciable to the touch, and, to obtain an impression equal in fineness of detail to the block itself, all the microscopic interstices of even the smoothest paper had to be levelled up by filling them with a calcareous deposit, and finished by heavy rolling. The printing press, too, had to be remodelled."

* * *

THERE is, we must admit, the utmost truth in Mr. Ward's remark that the half-tone block, with its almost imperceptible depth, has revolutionised modern printing, and thus American printing has become a standard in the world. But it is also the most expensive, for the American people pay for good work as no other people will. "It is safe to assert that many of the popu'ar illustrated monthly magazines and weekly papers which flood our country, published at from sixpence to a halfpenny, would not have a month's existence if issued in New York, on such cheap paper and with such inferior half-tone illustrations as pass muster here." It is pleasant to contemplate, however, that many British firms are strenuously endeavouring to educate public taste up to an appreciation of good paper, printing, blocks, and ink, and that success is surely, if slowly, attending their efforts. But to the very cheap section of the illustrated press we fear it is useless at present to look for improved half-tone work.

TINTS IN PHOTOGRAPHS.

THE question of colour in photographs is well to the front just now, and anything fresh on the subject is read with interest. There is no doubt whatever that many persons do like a little colour, or tint, beyond that of the photograph itself, that is, if it can be introduced to the improvement of the picture. It does not follow that the picture must be coloured throughout, as a distinct tint that will convey a fairly good idea, say, for example, a sunset or a moonlight effect, when used with discretion, is often an improvement on the plain photograph.

Recently we alluded to the Museum Night at the Photographic Club. At that meeting a frame of photographs—about 12 × 10—was brought forward, which had been many years in the possession of the Club, but had, apparently, been stowed away and almost forgotten. The pictures had a pleasing appearance; one in particular conveyed a very good idea of a glowing tropical sunlit landscape, others had different tinted effects. When the pictures were shown, none of the members, including the one who had undertaken to describe the Club's Museum (Mr. E. W. Foxlee) could say how they were done, until the name of the donor of them, the late Sir Thos. Parkyns, a former member of the Club, was mentioned. Then Mr. Foxlee was at once able to say how they were made. The method is one that, if used with judgment, may be made very useful, hence our reason for calling special attention to it, as well as to another one for obtaining similar effects.

The pictures in question were carbon prints developed on collodionised glass, after the manner of Lambert, introduced over twenty years ago. Sir Thos. Parkyns took out a patent for his invention in 1877, and, on reference to the specification, we find that two methods are described: one in which coloured collodion is applied to the carbon print, after it is developed, alumed, and dried, and before the final transfer; the other, in which the coloured collodion is simply

applied to the glass upon which the picture is developed. It is mentioned in the specification, and that is important, that, when body colours are employed, the collodion must not be applied to the glass plate.

It will be seen that the effects obtained under the two systems of working are quite of a different character, for, when the coloured collodion is applied to the glass plate, the tint is, of course, all over the picture—the shadows as well as the lights—the same as it is with a silver print on tinted paper; but, when it is applied to the developed print, and that is afterwards transferred, it only shows in the high lights and more delicate tones, while it is quite hidden in the shadows. It is a little doubtful if Sir Thos. Parkyns' patent would have proved valid if contested, because we know that Lambert had, a couple of years before, demonstrated to many of his pupils the effects that could be secured by tinting the collodion with different dyes.

Here is another method, practically analogous to one of those just described, by which very excellent tint effects may be produced, when used with judgment, that is recalled to mind and by which a friend of ours, some years ago, produced some charming results. In this case again it was the carbon process that was employed; but, instead of using coloured collodion, tinted transfer paper was used in place of white. This paper was tinted to suit the subject and the effect desired. For example, we remember that some Alpine subjects were very skilfully dealt with. In one the paper was tinted to a roseate hue, which produced a rich glow on the high lights of the snow, and conveyed a capital idea of sunset. Moonlight and other effects were obtained by the substitution of other tints. Fine effects with seascapes were also produced by similar means.

As the worker could not obtain the transfer paper with the tints required, he had, perforce, to coat it for himself, but he found no difficulty in doing that. All that is necessary is to float good ordinary paper on a solution of gelatine, containing a little chrome alum and tinted to the colour desired. In some cases it is only necessary to take the ordinary double transfer paper of commerce and float the gelatine side of it on an aqueous solution of the dye. But the former method is preferable.

Another New Photographic Light.—Among the exhibits at the Fourth Annual Exhibition of the New York Academy of Sciences, held in the Museum of Natural History on the 5th and 6th of this month, was one of which more may possibly be heard hereafter. It consisted of a row of seven Bunsen burners, with aluminium tubes, to show (*a*) the seven spectrum colours with the evaporated salts; (*b*) to produce monochromatic light in considerable quantities; and, among still other effects, to produce a pure Bunsen flame of great intensity as a light for photography, and illustrating its high actinic intensity. There were also shown a large number of important astro-photographic pictures of the moon, &c., the latter including negatives of some of the Lick pictures for the atlas of the moon, which is to contain a moon picture about a yard in diameter.

The Law of Copyright.—The recent interpretation, by Mr. Justice Collins, in the suit of Melville *v.* Hutton, of what is meant by "for a valuable consideration," will, no doubt, take many by surprise, and will, doubtless, materially affect the copyright of many published portraits. The article on the subject, by Mr. Ernest J. Richards, in our last issue, should be read by all, and the advice there given acted upon. There is one question that may well be asked, namely, Is this judgment to be allowed to stand without appeal, as it is quite against all precedent? It is scarcely probable that the plaintiff in the case will care to incur the expense of an appeal, yet the thing seriously affects every photographer, and, as it now stands, will be taken free advantage of by the illustrateds that demur to paying the photographer for the permission to reproduce his works. A good many will be watching to see if the Photographic Copyright Union will take any action in the matter.

A Hint.—Most photographers, when they give their consent to the publication of their pictures in any of the illustrateds, now stipulate that their names appear in connexion with them. This, of course, tells as an advertisement for them; but it may tell in two ways, for and against. Many of these reproductions, as they appear in some papers, are bad to a degree, not because the photographs were bad, or the process blocks from which they were printed were bad, but owing to the printing and the paper upon which they are printed. When looking at some of these wretched reproductions a few days back, we noticed under each "Photographed by ——," whose work, it is well known, is of the highest order. Now, the lay public, or a large proportion of it, will naturally not attribute these bad—we had almost said vile—illustrations to the printer and the paper, but to the photographer, as they were process blocks. Had the inscription been, "From a photograph by ——," the case would have been different. There is a wide difference between "from a photograph by" and "photographed by" in a case of this kind.

Remarkable Photographic Effects from Fireflies.—The ninth volume of the *Journal of the College of Science*, Imperial University, Tokio, contains a very remarkable account of some photographic experiments with these insects by Mr. H. Muraoka, Professor of Physics at Kyoto. He placed from 300 to 1000 of the flies in a flat box, and confined them in their place by a linen net. A dry plate, having in contact with it a variety of objects—plates of various metals, cardboard, thin wooden boards, &c.—was wrapped in several folds of black paper, and, after being placed in the box with the fireflies, left there for two days. The plate was then developed, and distinct images of the objects were produced. The conclusions arrived at by Professor Muraoka are: (1) The light from the flies behaves like ordinary light; (2) the light contains rays that pass through cardboard, metal plates, &c.; (3) when the photographic plate is covered by layers of cardboard, it presents an appearance which calls to mind the permeability of iron to "magnetic lines of force;" (4) the properties of these rays appear to be influenced by the materials through which they have passed, perhaps by the thickness of the materials; (5) the properties possessed by the radiations as specified in No. 2 are apparently non-existent, or, at least, undiscoverable, until after "filtration" (the Röntgen rays are similarly undiscoverable until after "filtration," *i.e.*, through the glass of the Crookes' tube, and "filtration" may perhaps afford a means of rendering the X rays homogeneous); (6) the "filtered" firefly rays can be reflected. We have not the original communication by us, the above description being an abstract from the *Lancet's* account, but it does not appear impossible that the action may arise from some cause external to the fireflies, as, for example, the influence referred to on previous occasions, whereby apparently an electrical discharge gave images of the relief matter on coins, medals, &c., a subject again taken up by Mr. James l'Anson in last week's *Nature*.

Effects of Electrical Discharge on Photographic Plates.—Mr. l'Anson now considers that the wire-skeleton radiographs, recently described by him, are not electrically produced, but are brought about by the "unequal loading of the film with silver particles, which set themselves in the pattern shown when the film is raised to a temperature near boiling point." In his latest experiments, Mr. l'Anson, to test Professor Smith and Mr. Sanford's theory of electrical radiation being the cause of the coin images, performed the following experiments: "I have placed a sensitive plate between two sheets of ebonite about one-sixteenth of an inch thick, which were placed upon a brass-face plate, and a coin laid on the upper ebonite plate.

The positive pole of the coil was connected with the brass plate, and the negative with the coin, and current passed for about two minutes. On development, an image of the coin came out, showing the design and a radiating halo, but out of focus and somewhat blurred, as might have been expected, as the coin was separated from the plate by the thickness of the ebonite sheet. This seems to point to some other action than the luminous discharge, which was plainly visible on the upper surface of the ebonite round the coil."

Art in the City.—It looks well for the appreciation of art in the City that no less than 40,000 persons visited the loan Exhibition of pictures at the Guildhall during the first fortnight it was open. It has been said that nothing is thought of in the City but Mammon; but that evidently is not the case, for all the art shows at the Guildhall have been well attended. As we mentioned a short time back, this Exhibition is specially interesting, as it is illustrative of the works of British artists who have flourished during the Queen's reign. Some critics have complained that a few of the artists are not represented by their best works; that is scarcely to be wondered at, because many owners will not part with them, hence those who had the getting together of the collection had to be content with what they could obtain. Any how, the Exhibition is a thoroughly representative and highly interesting one.

While on the subject of Art Exhibitions, it may be mentioned there is a very interesting one open at the East-end, St. Jude's Schools, Commercial-street, Whitechapel, where nearly 100 of Mr. G. F. Watts' R.A. pictures are on view amongst others. Those, however, who intend visiting this Exhibition should lose no time in doing so, as Sunday next, May 2, is the last day it will be open.

New Forms of Electric Light.—There are many rumours in the air, and actual statements made, as to recent inventions in connexion with electric lighting, which promise a greatly increased illumination from a given amount of electricity. Should they turn out to be true, the time when every portrait studio will be provided with this form of illumination cannot be far distant. We are afraid, though, that in most of the cases referred to the wish is father to the thought. For example, we are promised (the promise is "made in Germany") the introduction of an incandescent lamp giving nine or ten times the light obtained from the ordinary forms, the only change required being the adoption of a new form of globe, "which is absurd," to quote a well-remembered Euclidean phrase.

But a discovery of more serious note is described in *Wiedemann's Annalen* by Herr O. Schott, of Vienna, who explains the production of what he terms an electro-capillary light. The current from an induction coil is sent through a glass tube with a capillary bore, and fitted with aluminium or copper electrodes, the enclosed air being at ordinary pressure. This thread of air is more brilliantly luminous than the electric arc, but there is at present a fatal obstacle to its use in the fact that the current very quickly deteriorates the bore of the tube, roughening its surface, and causing the production of spherical enlargements. Tubes of increased bore were more permanent, but the light was much reduced.

It is stated that tubes twenty centimetres long can be used. It might be worth while trying a minute coil of such capillary tubing, and using it for lantern projection; the luminous area would be very small, and the electrodes could be protected beyond sparking point by being sheathed with glass for a sufficient distance.

A Novel kind of Photograph.—It does not follow that a novelty must be new, as what may be quite common now may hereafter become a novelty; so in the case before us. We were recently shown a number of small pictures that were very effective, not to say beautiful. They were oval miniatures vignetted, about one and a half inch in the longest dimension, of a deep warm black colour resembling in tone fine platinotypes. They were on glass the edges of which were bevelled and polished. Although two or three professional photographers of some years' standing were present, none of them could say how they were done. It may be mentioned that they looked quite as well by transmitted light as they did by reflected light. They were produced between five-and-twenty and thirty years ago, and this is how they were made.

A collodion positive was made from a negative in the camera, on thin, colourless glass, developed and fixed in the ordinary way. It was then toned with gold or palladium to the colour desired. The picture was then varnished and afterwards cemented with Canada balsam in optical contact with a piece of opal glass, in the same way as photographic lenses are cemented together. When the balsam had become perfectly hard, the picture was handed over to a lapidary to make oval and bevel and polish the edges. Although the pictures were made more than a quarter of a century ago, they have undergone no change, as they are perfect now, and could have been no better when they were first produced. They were, we believe, known as crystal portraits, and were introduced for brooches and lockets; but at that time portrait jewellery was going out of fashion, and, as they required considerable skill to produce, not many were done.

Should any one desire to produce pictures of this kind now, it would be necessary for him to have a complete knowledge of the wet-collodion process, a knowledge that few modern photographers possess. As an alternative, however, we might suggest that the carbon process be tried, the print being developed on glass and then mounted with the balsam on to a piece of opal. But we doubt whether the pictures so produced would have the same depth and transparency as those we were recently shown. If they would, this would be a simple method of producing them.

Preparing for the Outdoor Season.—At the present time a very large proportion of our amateur readers will be preparing for the active work of the outdoor season, for, though they may have already made a start in the Easter holidays, it will be in the vast majority of cases only a sort of preliminary canter, a stretching of the legs before the flag actually drops. Apparatus has yet to be thoroughly overhauled and examined for defects that may have developed during its months of disuse, and only those who are careful enough to give such attention to their instruments can be aware how apparently a few weeks or months of lying by seem to "take more out of" cameras and slides than the same period of actual use. It is, of course, not the mere fact of the want of exercise that produces the change, but rather the atmospheric condition of the season and the circumstances surrounding the storage of the articles while in the state of idleness. During the period of active use camera and slides may be submitted to a variety of conditions both of atmosphere and temperature, may be thoroughly soaked by rain or half baked by summer sunshine; but the general condition of affairs will be normal, for the soaked woodwork will be carefully dried before being again used, and so will take little harm when again taken out into sunshine. Not so in the case of average winter quarters, for, even if stored away in a dry cupboard during the winter months, the apparatus is subjected to a steady and continuous spell of slight damp without any interlude, and during that time the woodwork is slightly, though none the less surely, absorbing moisture and swelling, with the result that shutters and other sliding parts become jammed, and, unless carefully looked to before being taken into regular use, may be hopelessly ruined.

We have known cases of culpably careless storage which have resulted in dark slides actually becoming unglued at the points through excessive damp, but such are, we should hope, of very rare occurrence. But, even where the conditions of storage during the winter have been less trying, a little injudicious "carefulness" may result in almost as serious damage. For instance, a case came under our

otice two or three years back, in which, on turning out the pparatus after its winter rest, the shutters of the dark slides were ound to slide with difficulty, owing to the damp; so, before use, they ere placed in a warm cupboard at the side of the fire in the living om. Something of the result might have been anticipated, though arcely in so aggravated a form as proved to be the case, for the utters shrank to such an extent that they came clean out of the rooves of the slides, which had to be reshuttered entirely. If the eatment had been less sudden, from damp to actual dry warmth, is result would not have accrued, therefore we should counsel, as ell as *care*, judgment.

Apropos of the recent discussion on French chalk, far less use is ade of this material in its application to apparatus than it deserves, r it forms one of the most useful aids we have to ease and com- rt in the working of dark slides and cameras. A little of the powder pplied to the sliding parts, whether of shutters, slides, cameras, or ipods, and well worked in with a piece of flannel or an old tooth- ush, will go a long way, at all seasons, to make the parts work moothly; indeed, this treatment ought to be regularly applied to ll apparatus, but especially at this season, before starting the new ear's work. If there be any doubt, on the score of dust, as to the esirability of the application to dark slides, it may be entirely re- oved by the adoption of a plan, advocated in these columns a few ears back, of combining the French chalk with paraffin wax, to orm a solid lubricant, in which condition all danger of dust on the lates or films is entirely obviated. The paraffin is melted in any uitable vessel, and the powdered talc stirred in and thoroughly ixed; the proportions are correct when, on cooling a small portion f the mass, it just begins to be friable. If a softer preparation be referred, a small quantity of vaseline may be added, but we think his is better omitted. An additional advantage of this mixture is hat it acts, to some extent, as a protection against damp, and, if egularly employed, must eventually very effectively close the pores f the wood.

JOTTINGS.

Monsieur Chassagne, whose colour-photograph process has twice ecently been described in these pages, appears to owe Sir Henry Trueman Wood and Captain Abney—and, through those two listinguished men, the whole scientific world—an explanation, or s it an apology? That process, according to the particulars given ast week, is a method of print-staining by means of a wonderful ixture of chemicals, which, if it was used for the production of the esults shown at the Society of Arts, is, notwithstanding its omplexity of composition, possessed of extraordinary powers in orting itself out on the right parts of the photograph. But, besides ravely doubting whether the five solutions, as they are described, were either made or used for the purpose, I take it that few people ny longer place the smallest trust in the selective colour-absorption heory, upon which it was sought to base an explanation of the rocess.

Sir Henry Wood and Captain Abney were, of course, indebted to M. Chassagne for the meagre details of his process, which they published some three months ago. Those details fail to tally with the patent specification in more than one vital respect. That weird document contains absolutely no reference to selective colour absorption and the plan of setting up this strange action. Mark the following extracts:—

"Journal of the Society of Arts," *January* 29, 1897.

"A negative is taken on a gelatine plate, prepared by treatment with one of his solutions. . . . From it a print is taken on glass or paper . . . . specially prepared with the same solution."

Sir H. T. Wood.

"Nature," *February* 5, 1897.

"A negative is taken on a gelatine plate, which has been specially prepared. . . . . A transparency is taken on a similar plate, or a silver print on specially prepared albumenised paper."

Captain Abney.

The foregoing particulars are clear and definite enough, and were obviously supplied to Sir Henry Wood and Captain Abney by M. Chassagne. If my readers will kindly turn to pages 266, 267 of last week's Journal, they will notice that the patent specification is absolutely silent in respect of any special treatment of the negative plate or the printing paper. The patentees simply say, "We take a photograph that has been taken on nitrate of silver paper," to which they apply the five solutions described. This discrepancy calls for explanation. We may be sure that neither Sir Henry Wood nor Captain Abney would knowingly countenance any ambiguity of proceeding in this matter, in which, it appears to me, they have been placed in a false position. Will M. Chassagne be good enough to throw a little light on the subject?

The Yarmouth Convention will soon be at hand. I trust it will be the pleasant lot of Mr. Cembrano to preside over a gathering of photographers, numerically and otherwise, worthy of the year. One of the local papers has apparently been inspired to lay stress on the importance of having a big and imposing reception committee selected from the peerage, the landed gentry, and the "hupper suckles." An antidote to this mild attack of flunkeyism is supplied by the circumstance that previous reception committees have simply been ornamental impostures. They have never done anything but allow their names to be printed in the official programme. So why perpetuate a farce? The work is performed by the local executive, *plus* the indispensable necessary Drage, to whom be all the honour and glory that having their names printed in nice big type can bestow. But reception committees who don't receive are not worth the waste of type, ink, and paper.

The form of photographic buffoonery that has been so unpleasantly conspicuous at previous Conventions will not, it is to be hoped, put in an appearance at Yarmouth. I allude, of course, to the misuse of the hand camera, against which a timely protest has already been entered. To catch unsuspecting Conventioners in free-and-easy or ridiculous attitudes, to rapidly make lantern transparencies from the negatives, and show the results on the screen for the edification of friend and stranger alike, is a very objectionable form of childishness that has more than once given rise to unpleasantness of feeling at these meetings. Last year, a teetotal member was photographed in the act of drinking a glass of ginger beer; but the projected transparency did not label the contents of the glass, so, of course, the slide raised a small laugh at the expense of the teetotaller, whose feelings were not entirely pleasurable. Most of us, I suppose, like being photographed, and never complain of being snap-shotted, so long as good taste actuates the shutter release.

Mr. R. W. Paul, who has, for the last twelve months, prominently associated himself with animated photography, is a fortunate man. During the time named he appears to have made about 12,000*l.*, and, according to a prospectus that has been in circulation within the past few days, he is endeavouring to turn his business into a limited liability company. I notice in the prospectus that the business of the Company is expected to include, *inter alia*, the manufacture and sale of animated portraits of individuals, for the production of which it is intended to open studios, in order to take portraits of the general public. I find it difficult to understand how this idea is to be profitably carried out. The taking of these animated portraits is easy enough, but how are they to be utilised by the sitters? Are the latter expected to possess a projection system, limelight, screen, and all, for the purpose of showing their friends how they look when animated? If so, the idea is surely calculated to be a somewhat costly luxury.

The letter of Mr. J. E. Shaw published on April 2, in which he sharply criticises some of Mr. Hay Cameron's portraits of prominent men of science, and asks if the professional photographer is to abandon his old methods and endeavour to educate his customers up to tolerating the impressionistic in the divine art of portraiture, has

elicited several comments and replies not one of which, however, is of the nature of that demanded by Mr. Shaw. Probably Mr. Shaw and ninty-eight others out of every hundred professional photographers had best, for the present at all events, continue producing and supplying the "usual thing" in portraiture. The public at large, which does not consist of Wattss, Brownings, Herschels, Russell Lowells, Carlyles and Darwins, shows no appreciation of impressionistic photography, and on the principle of not supplying your patrons with what they do not want, Mr. Shaw and his *confrères*, if even their personal and private inclinations lead in the opposite direction, would do well not to jeopardise the success of their businesses by dabbling in a class of work for which the demand is so limited. A newspaper magazine article on the "art" of this, that, or the other person, is no guide to public taste, and is somewhat treacherous ground upon which to base an opinion of what pays in photography.

The education of intelligent, even intellectual, people into understanding or appreciating the "unusual thing" in photographic portraiture is a slow process. I am the proud possessor of a portrait of myself, produced by a friend whose skill in securing photographic impressions of the character of his sitters is widely admitted. For a long time my relatives and friends looked askance at this portrait; in the common phrase, they would not have it at any price. It was variously termed a caricature, a monstrosity, and other pretty things; but familiarity, by-and-by, began to breed toleration; appreciation soon followed, and now the once-derided caricature is held in the highest esteem as a truthful likeness. If Mr. Shaw and his brother professionals could afford to adopt the long and tedious process, here outlined, of educating their sitters up to an appreciation of "non-commercial" work, the Cameron cult might be worth taking up forthwith; but, as such a plan is obviously impracticable while rent, rates, taxes, and wages are to be paid, photographers are, of course, compelled to let the education of the public be conducted from without rather than from within. Still, those who are living in the middle of the next century will not improbably witness the usual thing in photographic portraiture as dominant and prominent as it is now.

Those who are to have charge of the organization of the projected national photographic record and survey collection, to be placed in the British Museum, will have a huge task; but, doubtless, the committee will frame a set of official working rules to guide them in their selection. One of the heaviest responsibilities to be faced will be that of assuring, as far as possible, that the chosen prints will be by what it is convenient to call "permanent processes." Fortunately the Royal Photographic Society is to be represented on the committee, so that the danger of this important point being overlooked is minimised.

I mentioned, for the information of Mr. J. W. Bennetto, a month ago, that other colour processes besides his were on the way. Since then, Mr. W. Brooks, no novice in photographic work, appears to have produced some results that have elicited the eulogium of those to whom they have been shown. Mr. Brooks twenty years ago published some interesting experiments on what might be termed the photography of the invisible. I trust his colour process will turn out a practical one. May I be permitted to express a belief that, if he thinks fit to demonstrate it, he will not go through the burlesque of allowing himself to be blindfolded? Yes, the air, so to speak, is thick with colour processes, and, as the poet of the music hall puts it, "there are others." COSMOS.

AMERICAN NOTES AND NEWS.

Editorial Changes in the States.—Mr. Frederick J. Harrison has resigned the editorship of *Anthony's Bulletin*, and is succeeded by Mr. W. I. Scandlin. The new editor of the *American Journal of Photography* is Mr. J. Bartlett, whose name is familiar to many of our readers. He has signalised his accession by making some interesting changes in the magazine.

The Stretching of Paper.—A useful note on this subject is given in the *Photo-American* by the editor of that journal. When printing portraits, he points out, it is necessary to know which way the paper stretches. Far better work can be produced by making use of the slight stretching, which always occurs on one way of the printing paper, than by taking it as it runs. It should properly be cut to stretch lengthways, but such is not always the case, so it is best to find out from the maker, or else buy 20×24 sheets, and cut as wanted, so as to have the aid of this property of stretching. When a man is generously endowed with adipose tissue there is no sense in using paper that will stretch sideways, nor is it to the advantage of thin people to have their already attenuated features lengthened by using paper cut so as to stretch up and down. Photographers always used to consider this point carefully when they prepared and cut their own paper, and many a customer has blessed the man who knew enough to do this simple little trick.

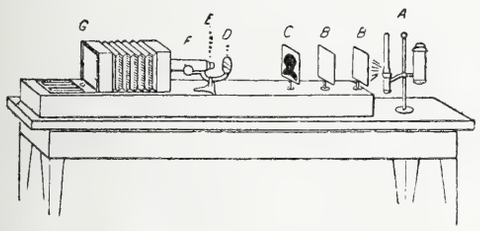
Photographing Bright Objects in Interiors.—Sheet music on a piano, windows, white *bric-à-brac*, silver ware, and mirrors, generally halate, says the same writer, if part of an interior view, when long exposure is necessary and a backed or double-coated plate is not used. "I got around it the other day in taking a well-enough lighted suite of rooms in the following manner: The silver ware, music, and white ware were removed, the windows in front of the camera were darkened with drawn shades, and wrapping paper, cut to fit, was temporarily stuck lightly on the mirrors. An exposure of fifteen minutes was given, and then, capping the lens, I replaced the music, &c., removed the paper from the mirrors, and, raising the curtains, gave two seconds more, and obtained an excellent result, with no halation whatever, the notes on the music sheet clearly distinguishable, the view out of the window well defined, excellent detail in the *bric-à-brac*, and proper reflections in the mirrors."

Wanted, a Photograph of George Washington!—It is the veteran writer, Mr. A. Bogardus, who, in the *St. Louis and Canadian Photographer*, is thus sighing after the unattainable. I have often wished we had a good photograph of George Washington; then, he says, we should *know how he looked*. A New York monthly magazine has lately published thirty pictures of him, and, to my eyes, he does not look like the same man in any two of them. To be sure, they were painted at different periods of his life; yet a man's face does not *entirely* change with age. A good photograph would have been true. We are compelled to remember him, as best we can, by these entirely different so-called portraits of him. I often think of an expression attributed to Bismarck. He was invited to see a painting of some prominent personage. He said: "It is a fine painting, and a beautiful work of art; but, when I want to see his *likeness*, I look at his photograph." Was Washington's face so entirely different from that of other men as the various portraits represent him to have been? I well know that it is impossible, and do not expect to find two faces exactly alike; yet there is often a strong resemblance, so much so that one man is often taken for another. Is it possible that no man ever resembled him? During my business career I always looked for a face that resembled his, but never (except in one instance) saw one that resembled the portraits of him. One day, as I was passing through a business street, a large young man was rolling out barrels of provisions. As I saw his side face, I thought, for the instant, that face resembles Washington. Taking the trouble to go in front of him, the illusion vanished. As Washington's face was clean-shaved, it would hardly seem possible that he should have looked so differently to the various artists.

Collodion *versus* Gelatine Papers.—If we are to credit Mr. G. Hanmer Croughton, who writes in the *St. Louis* on the subject, there is much rivalry in the States between the makers of these two kinds of printing-out paper. The makers of collodion papers, he states, claim that *no* gelatine papers are permanent, and they say the gelatine is at fault, that all emulsions made in gelatine are unstable. This is a grave charge, and cannot be sustained, for, if it is the gelatine that is the cause of fading, then, what is to become of our negatives? "It is a curious thing, with all that has been written and said on this subject, that no one has thought (or if they have, I have never seen it in print) of blaming the paper. I have prints made on gelatino-chloride emulsion, coated upon plain Steinbach paper, which are as good to-day as they were when first made; but some coated after these upon the *filled* papers, which were introduced to give an extra gloss, are faded. Gelatino-chloride emulsion coated upon opal will change by reason of the arsenic in

he opal, but the same emulsion coated upon celluloid will stand the est of time. Do we, any of us, know what is used to fill up the grain of the paper, and give the bright enamel surface which was he craze a short time since? Whatever it is, I am convinced that his filling has far more to do with the fading of both gelatine and ollodion prints than the emulsion coated upon it. If the same emulsion coated upon a plain piece of Steinbach paper will stand, while, if it is coated upon a faced paper, it will fade, I think there an be little doubt where the fault lies. Now that the craze for right-surface prints is dying out, why do the manufacturers still se a faced paper for their matt-surface emulsions? There is no eason for it, and many reasons against it; at any rate, the manu-facturers of printing-out papers have to meet this universal com-plaint of instability, and it will be well for them to look into the auses, or there will be a general return to albumen paper."

Photographing with the Eye of a Beetle. — One of nost interesting slides of the microscopist's collection has long been he cornea of an insect (usually a beetle), arranged so as to show at he focus of each of its hundred of lenses a picture of some object. This has been commonly called the multiple image, says Dr. G. F. Allen, in the *Photographic Times*. It occurred to me, some five or ix years ago, while doing other photo-micrographic work, to try to photograph the multiple image. My first efforts proved complete ailures, and it was only after repeated experiments with various yes, and different subjects, that I finally succeeded more than a ear afterwards. The best cornea I used was that of the beetle, *Hydrophillus piceus*, from which I punched out a minute circle, ontaining about 400 lenses, and mounted it in balsam, pressing t out as flat as possible. The subject should have strong contrasts, nd be without too much detail, a silhouette with exaggerated eatures seemed to suit the case best. By reference to the diagram



he arrangement of apparatus will be best understood. A student amp furnishes the illumination, the light being modified by at east two ground-glass screens, B B; then comes a three-inch sil-ouette, C, also on ground glass, and, to prevent the pictures over-apping each other, all light except a four-inch circle around the ilhouette is cut out by opaque paper. This circle is not shown in he cut. The slide of beetle's lenses is held by the stage of a micro-cope inclined to the horizontal, and its eyepiece thrust into the ront of an ordinary camera. I want to emphasise the fact, that the icroscope has nothing to do with the formation of the picture, but mply enlarges it and conveys it into our camera. The image is rmed in the air at E, and it would certainly be possible, by placing plate at that point, to take the photograph there; but it would equire a microscope to see when you had it focussed, a micrometer rew adjustment for your plate, and a microscope every time you anted to look at your finished work; so I use the microscope nce for all, and enlarge the image before it reaches the plate. The xposure is made as in other photo-micrography by an opaque object terposed anywhere between the light and the camera, preferably etween C and D. Obviously no condenser or substage is used on ne microscope. An ordinary plate is used, and developed in the sual way.

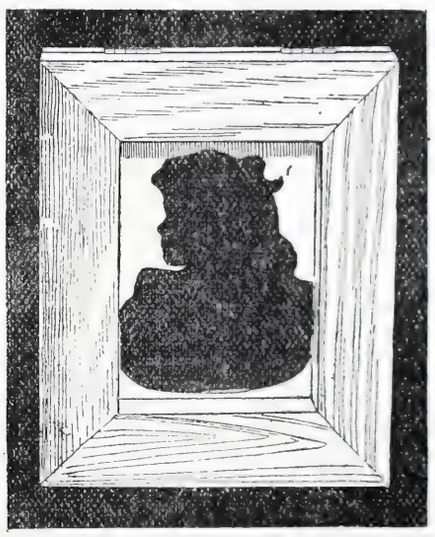
A Bas-relief Process.—Mr. George G. Rockwood, in *Wilson's Magazine*, briefly describes this process:—"A prerequisite r making bas-relief portraits is a hinged double frame as shown in g. 1. This, which may be called a modelling frame, is all the plant' essential to the process, and is an inexpensive affair. The pening for the smaller-size picture should be the size of a trimmed binet print; for an 8 × 10 print the opening should be 7 × 9. aving the frame, we proceed as follows: "1. Make a brilliant atinum print, preferably from a profile negative lighted *à la* embrandt. Now, on a sheet of very transparent paper, such as e paraffin preservers used to protect cabinet pictures, make a careful acing of the outline and principal features of the print with a *soft* ncil. 2. Mount the platinum print on thick white blotting-paper with Higgins's mountant (this seems to be a mixture of glue and starch, and is admirable for the purpose set forth). Smooth the print down gently into contact, with a roller if you have one, and then lay it aside under pressure until it is required, a few minutes later. The dampness thus permeates the absorbent base and print, giving both the plasticity required for the next operation. 3. Trim a piece of cardboard to the size of the outside of the modelling frame. Place the tracing, face down, carefully upon this cardboard, and, with the handle of a toothbrush or the thumb nail, make a 'set-off'

FIG. 1.



from the tracing on the cardboard. If the 'set-off' or trans-ferred outline is weak, strengthen it with a few strokes of the pencil. 4. Insert the sharp point of a pair of scissors just inside the out-line on the card, and very carefully cut out the design close to the pencil lines. The more accurately this is done the better will be the

FIG. 2.



final results (fig. 2). 5. Having made a good 'cut-out,' place it on the face of the mounted print, which is now in proper condition for use, and carefully register the 'cut-out' to the outlines of the subject on the print. If the print has expanded, cut the card away, preferably at the back of the head of the subject, until the 'cut-out' and outlines exactly register. Now place both mounted print and cardboard 'cut-out' in the modelling frame (fig. 1), and securely fasten the frame by the clasps at the ends. —6. With the handle of a toothbrush, or any similar smoothly blunt burnishing tool, begin to rub and press the print from the back, following the outlines of the 'cut-out' and working up the relief desired with care. The dampened print, being quite pliable, responds to every touch. This part of the work is, of course, done with the right hand, the left hand holding the frame to the table and the thumb following the working of the burnishing tool to keep the edge of the 'cut-out' close down to the print, as the dampness of the latter will cause the card to cockle and spring up, thus injuring the sharpness of the outline. When the outlines have been raised to the degree of relief desired, the inside features may be similarly and more freely treated. These may be relieved to about a quarter of an

inch. A little experience will enable the photographer to easily and accurately accentuate the light draperies and hold back unimportant details. The relief so gained will remain, and, owing to the paste used, will stiffen, and prevent any crushing of the picture unless severely handled. Suitable matts or cardboards, thick and of pliable material, may be had at the various supply houses at a cost of about three dollars per dozen, or less."

ORTHOCHROMATIC COLLODION EMULSION.

In last week's column of Foreign News and Notes, Dr. H. W. Vogel is reported to have written, "Who knows that orthochromatic collodion emulsion may not yet be used for portraiture?" It is only a question of exposure, not a question of the possibility of giving an exposure short enough for the sitter yet long enough for the plate, but one of comparison with gelatine. We have become so accustomed to the extremely short exposures required with the quicker gelatine plates, which alone give the best results in portraiture, that I doubt whether photographer or sitter will ever consent to go back much in the direction of the old wet-plate exposure, if at all. So far as actual exposure is concerned, it is possible with an orthochromatic collodion emulsion plate to work, I think, far more rapidly under "studio" conditions than with an ordinary wet plate, and I think, if the experiment were made with such a plate, and a slow or "ordinary" gelatine side by side under identical conditions, that the advantage would be in favour of the orthochromatic collodion.

I have to-day taken, in an ordinary room, with a lens of the rapid rectilinear type, a well-exposed portrait with fifteen seconds' exposure. With a portrait lens and wet collodion I am quite sure that, under the same conditions, a like result would be quite impossible. Indeed, speaking from recollection of long-past experience with wet-collodion attempts at portraiture indoors, I doubt whether the result could be obtained with any exposure that the sitter could stand, and, even with some of the popular gelatine plates of the "ordinary" grade, I question whether the shadow side of the picture would be as well brought out. At the same time the exposure is at least three or four times as long as would be required with an average "rapid" gelatine plate, and the ratio would be proportionately greater in a better or "studio" light, for the advantage of the colour sensitising is more apparent under the conditions of indoor portraiture, or where the light is bad.

So far as portraiture is concerned, the question resolves itself, then, not into one of possibility, but of whether the greater orthochromatic powers of collodion plates are sufficient to compensate for the undoubtedly longer exposures required, and I am afraid that, until some further steps are made in the direction of increased rapidity, gelatine will still continue to hold the preference; but, if the question of exposure stands in the way of the readoption of collodion for portrait work, the same arguments do not hold good with regard to other branches of photography in which the special colour sensitiveness is particularly useful, or even landscape work. In reproductions of paintings in "three-colour" work, and for all similar purposes where the length of exposure is immaterial, except so far as economy of time is concerned, the greater power of collodion is undoubted; and, even in ordinary landscape work, the orthochromatic collodion plate presents features that will recommend it to those workers who prefer a slow, brilliant plate to one of the highest rapidity.

The weak point of ordinary collodion plates—I speak now of emulsion or dry collodion when applied to landscape purposes—is the very strong contrasts they give, and, except with very long exposures, their heavy rendering of foliage and badly lighted subjects. The short range of sensitiveness of the collodion film under ordinary circumstances conduces to this result, while, on the other hand, the more extended range of the rapid gelatine plate, and its exquisite sensibility to extremely feeble illumination, tend, in a contrary direction, to flatness and want of "sparkle;" hence the preference evinced by so many landscape workers for slow gelatine plates for their purpese.

But slow gelatine plates, although they give a more brilliant rendering, and allow greater latitude in working, with an ordinary well-lighted landscape, suffer from precisely the same defects, though perhaps not to the same degree as collodion, when badly lighted subjects are in question, and this is equally the case whether it be out of doors or in the studio. They are not sufficiently sensitive to the weaker illuminations to render them in due proportion to the higher lights. If colour sensitising be resorted to, some little general improvement is undoubtedly gained, but it is at the expense of a considerable increase of exposure, and possibly also the use of a yellow screen, for, in the case of gelatine plates, the action of the sensitising dyes is small in proportion to their slowing effect on the general sensitiveness.

With collodion, on the other hand, whether wet or dry, the effect of the dye in sensitising for yellow is so great, that it practically overcomes the general slowing of the plate that would otherwise arise from its partial suppression of the blue and violet; and so it happens that a collodion plate may be rendered extremely sensitive to yellow without practically slowing it to any appreciable degree, and may even be so far "orthochromatised" as to reverse the relative sensitiveness of the blue and yellow without the employment of any coloured screen, and with, for ordinary subjects, portrait or landscape, little disturbance of the general sensitiveness.

The methods by which these effects are produced are so simple and easily applied that I am surprised more use is not made of them. No special emulsion is required, as any clean-working bromide emulsion will do, and only requires staining with eosine or eosine silver. The former, of course, is milder in its action than the silver combination, but the latter gives the greater colour sensitiveness; while, in order to secure the reversal of the values of blue and yellow, a second dye is used to specially slow the plate for the blue and violet rays.

The dyes may be used in the form of a bath, or may be added directly to the emulsion if it be a washed one; but, under the latter circumstances, the preparation will not keep more than a few days. With an unwashed emulsion, however, the dye bath is so easily applied without much addition to the labour involved that it seems to me to be the better plan. If added to the emulsion, the following solution is used:—

Erythrosine or eosine	60 grains.
Nitrate of silver	60 ,,
Ammonia	*q. s.*
Distilled water	6 ounces.
Alcohol	6 ,,

Dissolve the eosine in a part of the water—hot—and the nitrate of silver in the remainder. Mix, and when cold add ammonia until the solution becomes clear, then add the alcohol and filter. From ten to twenty minims of this solution may be added to each ounce of emulsion. For unwashed emulsion, after the glass has been coated and washed, immerse it for a minute or two in the above solution, diluted with nine times the quantity of water. The exposure will be about the same as without the dye, and in either case, before development, wash well and preferably apply the pyro and bromide before adding the alkali. With this treatment the blues or yellows have about equal activity; if it be desired to reverse them, add in proportion to the effect required a yellow dye—auramine, or picric acid.

W. B. Bolton.

THE UTILISATION OF THE LIGHT WHICH PASSES THROUGH THE SENSITIVE FILM.

Captain Colson, in a recent communication to the *Société Française de Photographie*, pointed out that a great deal of light passes through the film, and this can be utilised, and thus the exposure in the camera reduced, if a reflecting surface be placed behind the plate. The idea, as the Captain admits, is not new, but he has approached the subject from a somewhat new standpoint.

He points out that it is essential that the reflecting surface should be in immediate contact with the film, and that the image should fall on the plane of contact. This condition is essential for sharpness of definition and for the purity of the whites of the negatives, for a space between the two surfaces infallibly produces fog. It is also necessary to ensure that the plane of the focussing screen is coincident with that of the sensitive film.

A white surface, such as a sheet of white paper or card, is preferable to a polished metallic surface, in that the latter only reflects the light in particular directions, according to the well-known law that the angle of reflection is equal to the angle of incidence; whereas the card or paper diffuses the light in all directions, independent of the angle of incidence. The surface of the card ought to be glossy.

The first trial of this plan was made by placing a piece of white paper and a piece of black in contact with the gelatine. and with an exposure of 1-15th of a second. That part in contact with the white paper was much more intense than where in contact with the black.

The negatives made in this way are, of course, reversed as regards left and right, but this is no disadvantage for projection, or for printing in carbon, or for photo-mechanical printing.

The only disadvantage in presenting the glass to the lens is that there

s a slight distortion of the image towards the centre of the plate, due to he deviation of the rays, which strike the glass at an angle. Thus, ssuming the refractive index of the glass to be 1·55, and the angle of ncidence of the rays to be 30°, which corresponds to an angle of view of 0°, the distortion is equal to one-fourth of the thickness of the glass, so hat with a glass two millimetres (=1-12 inch) thick, the distortion ould be 0·5 mm. (=1-50 inch), which, for scientific work, is far too reat, but which is quite negligeable for landscapes or portraiture. These igures only apply to the edges of the plate, and the longer the focus of he lens the less the distortion.

There must be, of course, also some little loss of light due to reflection rom the front surface of the glass, and again from the second surface, nd this loss increases from the centre to the edges of the plate, but the ffects are inappreciable, even with a large field of view.

It might be supposed that the light reflected in the interior of the lass would cause fog, but that this is not so is proved by the fact that he whites remain clear.

To prove that the same intensifying action took place even when the ight was very feeble, Colson copied a chromo-lithograph with a pinhole, nd found that, with an aperture of 1-100 inch, and a camera extension f ten inches and an exposure of ten minutes, the use of a white card onsiderably intensified the negative.

In the case of celluloid films there is no loss by reflection, and it is unecessary, in consequence of the thinness of the support, to expose them rom the back.

In the case of a paper support, it will be seen, from the above reasoning, hat paper coated with the same emulsion as a glass plate, should be nore rapid than the latter.

THE GUM BICHROMATE PROCESS IN THREE COLOURS.

Ritter von Schöller, whose charming little picture was medalled at the ast Pall Mall Exhibition, has been using the gum process for producing hree-colour prints, and gives in the current number of the *Wiener Photographische Blätter* some details of his method of working.

For the yellow plate he uses a cell filled with equal parts of solutions f methyl violet and rhodamine, the strength of which is not stated, but nust be found by trial and error; as red, blue, and violet should not rint, these colours must be opaque in these places, and he used Albert's mulsion "eos," and added ten per cent. of the R. P. dye sent out herewith, but Lumière's red sensitive plate may also be used.

For the red-printing plate a yellow and green sensitive plate should be sed, and a filter of cupric chloride with some sulphate of copper.

For the blue plate a solution of aurantia, or a dark aurantia dry screen nay be used.

As pigments, Milori blue, gamboge, and Munich lake were used, and pplied to the papers with bichromated gums, and further treated as has ately been described in these columns. The process is practically the ame as that about three years ago published in the *Photographische Correspondenz*.

Herr Walzek, who has also been working this process, uses an ordinary late without a screen for the yellow plate. The red-printing plate is nade behind a Lumière dark yellow screen, with a Lumière A or Edwards late. The blue-printing plate is made behind a copper-red glass screen, nd on a red and orange sensitive Lumière B plate. Watzek uses the ame pigments as Schöller, but coats his paper with a two to five per ent. aqueous solution of shellac.

THE YERKES OBSERVATORY.

America has now obtained a very gratifying position in the scientific world, not only by reason of the individual efforts of her scientific men, but also on account of the splendidly equipped institutions maintained by the Government, or through the munificence of private individuals. The poorest citizen can write to the proper bureau at Washington on any scientific question germane to that bureau or division which may puzzle him, says *The Scientific American*, and he will receive a prompt and courteous reply, either dictated by or passed upon by some specialist of reputation. The value of the Smithsonian Institution is recognised all over the civilised world, and in astronomy it is gratifying to note that the astronomers of America have had their researches properly recognised abroad.

The United States are fortunate in possessing observatories equipped with the two greatest refracting telescopes in the world—the Lick and the Yerkes Observatories, situated respectively at Mount Hamilton, Cal.; and Williams Bay, Wis.

The Yerkes Observatory, of the University of Chicago, was founded in 1892 through the liberality of Mr. Charles T. Yerkes, prominent in railroad circles in Chicago. Williams Bay, near Lake Geneva, Wis., was selected as a good location for astronomical work. The contract for the 40-inch object-glass, the largest in the world, was awarded to Mr. Alvan G. Clark in 1892, and that for the equatorial mounting to Messrs. Warner & Swasey of Cleveland, O., who made the mountings for the great telescopes at Washington, D.C., and Mount Hamilton, Cal. The mounting of the Yerkes telescope, though not entirely finished, was exhibited at the World's Columbian Exposition in 1893. It is similar to that of the Lick telescope, but is heavier and more rigid.

The optical glass for the objective was made by Mantois, of Paris, which is the only concern capable of turning out discs of the required size. The object-glass required two years of unremitting labour to finish it. It has been examined by a committee of experts, and it was found entirely satisfactory. The definition was found to be fully equal to that of the Lick telescope, and Professor C. A. Young states that it gathers twenty-three per cent. more light than the hitherto unrivalled objective in the Lick Observatory. The great glass will do honour to the sole survivor of the famous firm whose product is recognised even by foreign governments, for the Clarks furnished the 30-inch lens of the Pulkowa Observatory.

The crown-glass lens of the great object-glass is double convex, about $2\frac{1}{2}$ inches thick in the middle, though only $\frac{3}{4}$ inch at the edge. It weighs 200 pounds. The flat surface of the plano-concave flint-glass lens faces the eye of the observer.

This lens is about 2 inches thick at the edge, and $1\frac{1}{4}$ inches in the centre, and weighs over 300 pounds. The two lenses are separated by a space of $8\frac{5}{8}$ inches, and are set upon aluminium bearings in a steel cell itself weighing 500 pounds, so that the whole mass, which has to be carried at the upper end of the telescope tube, amounts to nearly 1000 pounds.

The focal length of the object-glass is 61 feet, so that the total length of the instrument will be between 62 and 63 feet. This will be increased by several feet when the spectroscope is in place, and a dew cap about 7 feet long will project beyond the object-glass. The image of the sun or moon formed in the focal plane will be nearly 7 inches in diameter.

The magnifying power of the telescope can be made by mere change of eyepiece to range of 200 to 4000. The highest power will bring the moon, optically, to within about sixty miles of the astronomer's eye, but very much lower powers are used in practice, as more can be seen with them.

The Observatory building is situated on the northern shore of Lake Geneva, about seventy-five miles to the north-west of Chicago, in an ideal rural region, free from the dust and smoke of cities and the tremors caused by traffic. It is 180 feet above the water, and stands in a tract of ground which was given especially for it. The site of the Observatory includes about fifty acres of wooded land fronting on the lake. It is believed that the conditions will be favourable for the most delicate investigations in all branches of astronomy and astro-physics.

The architect of the building was Henry Ives Cobb, whose Fisheries building at the Chicago Exposition attracted much attention. The building is in the form of a Roman cross, with three domes and a meridian room. The longer arm, running east and west, is about 330 feet long. The great dome, in which is housed the big telescope, is situated at its western extremity, and the meridian room is at the other end. The cross arm carries a smaller tower and dome at each end. The 12-inch telescope, which was formerly at the Kenwood Observatory, Chicago, has been set up in the north-east tower, and has been in daily use. The other dome is not built as yet. In the southern dome a 16-inch telescope will eventually be placed. It is expected that a great deal of the minor work of the Observatory can be conducted with these two instruments; for any work which can be done with a moderate-sized instrument can be accomplished much more readily and rapidly with a small telescope than with a large one, and Professor Young aptly says that "an observatory equipped with one great telescope only is much like a warship with no rapid-fire guns." Between the two small domes is the heliostat room, 104 feet long and 12 feet wide. A heliostat with 24-inch plane mirror will stand on a pier at the north end of the room under an iron roof, which can be rolled away to the south.

The meridian room is designed to receive at some time a first-class meridian circle, but at present a small transit instrument is used. The room has double sheet iron walls, with an intervening air space. The body of the building is divided through the centre by a hallway extending from the meridian room to the tower which supports the great dome. On either sides are offices, computing rooms, library, lecture room, two spectroscopic laboratories, photographic and chemical laboratories, galvanometer rooms, &c. In the basement is a dark room, an enlarging room, a concave grating room, with large concave grating spectroscope, constant temperature room, physical laboratory, optician's room, &c.

The instrument shop, which has been fitted up under the direction of Professor Wadsworth, must be regarded as an extremely important adjunct in the observatory work. In this shop various pieces of apparatus needed for the investigations of the Observatory are constructed.

The optical laboratory is being fitted up by Mr. Ritchey, optician of the Observatory. It might be reasonably supposed that this work was

undertaken because of a lack of instrument makers, but this is not the case. American optical instrument makers are second to none. It is believed, however, that the best results can be obtained only when instruments of research are constructed under the immediate supervision of those who are to use them. Desirable changes in construction or design which become evident as the work progresses can, under these circumstances, be readily and inexpensively made, and it is believed that the instrument makers themselves will benefit by it in the end.

The power for working the motors of telescope dome, rising floor, and instrument shop, and electricity for lighting and steam for heating is all generated in a separate building at some little distance from the Observatory proper, equipped by Mr. Yerkes with two 40-horse power Ideal engines, direct connected to Siemens-Halske dynamos.

The telescope stands under the great dome of the Observatory. The column and head, which are of cast iron, rise to a height of 43 feet and weigh 50 tons. A spiral staircase at the south side of the column leads to the clock room, which is in the upper section, and to the balcony which surrounds the head. The polar axis is made of steel, 15 inches in diameter, 13½ feet long, and weighs 3½ tons. The declination axis is of steel, 12 inches in diameter, 11½ feet long, and weighs 1½ tons. The tube, also of steel, is 64 feet long and 52 inches in diameter at the centre, tapering toward the ends. Its weight is 6 tons, but it is so beautifully balanced that a pressure of 20 pounds would move it easily.

The driving clock is controlled by a double conical pendulum, mounted isochronously, and is kept wound automatically by an electric motor, and weighs 1½ tons. It is geared to the main driving wheel, 8 feet in diameter, which, when clamped to the polar axis, revolves it, together with the tube and all its accessories, a weight of 20 tons, in exact sidereal time.

All quick and slow motions and clamps, both in right ascension and declination, are operated electrically and also by hand, the electric motors, magnets, and illuminations being controlled from a switchboard placed within easy reach of the astronomer. The assistant astronomer also has full control of the quick motions in right ascension and declination from the balcony. The old style hand attachments for the slow motions are not entirely done away with, but are provided solely as a measure of precaution in case of disabling of the electrical plant or the breaking of a wire, electric motors being coupled directly to the different slow-motion screws. Little now remains to be done to the mounting. The dome and rising floor are also finished, and in a short time the large object-glass will be in place, and the telescope will be ready to use for actual observations.

The attachments of the Yerkes telescopes will include: 1. A position micrometer by Warner & Swasey. 2. A solar spectrograph, for micrometrical and photographic investigations of the spectra of solar phenomena. 3. A spectro-heliograph, for photographing the solar chromosphere, prominences, and faculæ by monochromatic light. 4. A stellar spectrograph, for researches on the spectra and motions of stars, nebulæ, comets, and planets.

The great dome of the Yerkes Observatory, 90 feet in diameter and 60 feet high, was designed and constructed by Messrs. Warner & Swasey. The dome consists of a framework of steel girders covered with a sheathing of wood and tinned on the outside only; it weighs 140 tons, and revolves on 36 wheels running upon a circular track of T rails built upon the masonry walls. The journals for the wheels are provided with anti-friction bearings. The dome is revolved by means of an endless cable connected with the turning mechanism and operated by an electric motor.

The two shutters are 85 feet long, covering the opening, which extends from the horizon to a point 5 feet beyond the zenith. They are supported on tangential tracks at their extreme upper and lower ends, and run on wheels with anti-friction bearings. They are so easily adjusted that a direct pull of 72 pounds at the lower end moves the shutter its whole length, its position being maintained parallel with itself throughout the entire distance of motion by special mechanism. The shutters open from the centre outward and work simultaneously.

The elevating floor, also designed and constructed by Messrs. Warner & Swasey, is 75 feet in diameter and weighs 37½ tons. The floor is circular in shape, and completely surrounds the telescope column, which is placed practically in its centre. The floor is supported by four cables 90 degrees apart, and is carefully counterbalanced by weights running in four columns which serve as guides. The ropes for operating the floor also run in the same columns over sheaves placed at the top, the other end of each of the four ropes being wound around separate drums 4 feet in diameter, placed at the base of each of the columns. The drums are operated by worm gearing, and all four of the shafts which run the worms are operated from a single point by means of an electric motor, the arrangement of the drums and operating mechanism being such that the different positions of the elevating floor are always parallel to each other.

A balcony 5 feet wide surrounds the inside of the dome at the lowest position of the elevating floor, and another one 23 feet above it at its highest position. When the telescope is directed to the zenith, the objective will be some 75 feet above the normal level of the floor.

The organization of the Yerkes Observatory is as follows: George E. Hale, director and astrophysicist; S. W. Burnham, astronomer; E. E. Barnard, astronomer; F. L. O. Wadsworth, astrophysicist; Ferdinand Ellerman, assistant; G. Willis Ritchey, optician.

When the great object-glass is in position, it is certain that the Observatory will become a place of pilgrimage for astronomers of all countries.

RAILROAD PHOTOGRAPHY.

[Read before the Photographic Society of Philadelphia.]

Photography has been very largely used by great railroad companies for years, and many fine pictures have resulted by the employment of skilled operators for this work. The pictures thus produced are usually large, and serve as advertising mediums, the officials realising the fact that the public is attracted by pictures. Each road has its peculiar features to illustrate, therefore my remarks will apply specially to those over which I have travelled with special facilities. This class of work requires quick judgment and considerable experience in handling men as well as outfits, and means real hard labour; everything must be done quickly in order to avoid accidents, and to make a good showing in results for the amount of energy and money expended. When I undertook the task of going over the main line of the Pennsylvania Railroad, I felt that I had a great undertaking before me, as this is the greatest highway to the West, and immense numbers of trains are constantly running. I was directly under the care of the passenger department, whose advertising staff is headed by Col. F. N. Barksdale, whose generous assistance and unbounded faith in the enterprise helped success. An order was given by the general manager, addressed to all superintendents of divisions, instructing them to place at my disposal an engine and crew whenever necessary, and to attach my cars to such trains as would move me from place to place as I directed. I never had to show this order, as the superintendents had all been instructed, and were prepared for me on my arrival on their divisions. I was instructed when I began my work to select views as much as possible on the main line of the road, and to illustrate special points of interest, such as the Horseshoe Curve, Packsaddle, Allegrippus, and others, and also to show, whenever practicable, the fine road bed, four-track system, track tanks, block towers, safety signals, &c., which I did on large plates, mostly 18 × 22, and with a panoramic camera, on films measuring 18 × 47½ inches. To successfully carry out my instructions, I was given the use of a car specially fitted for this purpose, in which Mr. T. N. Ely, chief of motive power, took a special interest, and gave many useful suggestions in regard to ventilation of dark room, safety brakes, storage and equipment of dark room. In this dark room are kept the lenses and exposed plates, as well as films, both exposed and unexposed.

To all appearance from the outside, Car 1382, save an elevated platform on the top and the name, "Photographic Car, Pennsylvania Railroad," is identical with the regulation coach. This elevation is half a foot high, and covers an area of some six feet square; it is especially constructed for supporting the instruments and cameras, where a commanding view is desired, at points where a foot or tripod hold could not be found on the mountain's steep side.

The forward part of the car for some twenty feet is furnished and decorated with the exclusive end in view of promoting the comfortable living of the operator and his assistant, furnished as it is with comfortable parlour chairs and a commodious desk, well lighted. The walls are adorned with road schedules and maps, framed photographs and prints, ranging from the views along the line of the railroad to points in South America and Europe. Two modern folding plush sofa berths extend their tempting softness after a hard day's mental and physical work, and add a decidedly finished appearance when made up into sofa seats during the day. In case of necessity, should a stop be compelled over night at a way station, a supply of cots can be brought into requisition for use of conductor, engineer, and crew, but this was not likely to happen any more than a call for the use of the cooking stove and utensils, for the car is a "personally conducted" one, and, running on the schedule of a special train, manages to stop over night where the hotels have a table record.

The dark room is in the centre of the car, running for a distance of twelve feet in length and five feet in width, equipped with ruby and orange windows, negative racks, and all developing facilities, together with a tank holding a three-hundred-gallon water supply.

The system of perfect ventilation, without allowing light to penetrate the dark walls and ceiling of this apartment, was accomplished by a four-inch opening where the side walls met the floor, and built out from this was a false side running to the roof and angled to an opening in the car, thus allowing a free passage of air, but not a ray of light.

Every precaution was taken for the careful transport of the valuable plates, and the rear portion of the car was devoted to the trunks, built and padded for carrying the outfits.

My first plan was to use films entirely, but I found I could not rely on having them evenly coated in large sizes, therefore I adopted Carbutt's orthochromatic plates, which were entirely satisfactory. For the panoramic views I used films, these being necessary, owing to the peculiar construction of the camera, of which I will speak again. I had with me three complete outfits—a 6½ × 8½, and 18 × 22, and the panoramic. The latter two were carefully packed in trunks in order to ship them as

baggage when it was not desired to take the car, as I made a number of trips away from the road, either by coach or waggon.

While operating in the mountains between Altoona and Pittsburg, I was given the use of a passenger engine, and a crew for my car, consisting of a fireman, conductor, and brakeman, and an extra assistant for carrying purposes; in addition to this I always had my own assistant with me. I would generally start in the early morning, and follow an accommodation train, placing myself on the platform to get a view fore and aft. When approaching what seemed a favourable location, I would signal to slow, and perhaps stop. A quick survey was made, and, if a favourable decision was reached, the outfit was hurried out and a picture made. It was sometimes necessary to unload the outfits and run the train away, to allow other trains to pass. In this way I would expose from six to twenty-four plates each good day. A record was made of each plate at the time of exposure, and the correct title of the view was noted, and each night, when they were packed, a slip containing this was placed in each box of six. After remaining out a week or ten days I came back to Philadelphia and developed—in this way I could repeat an important view if neeessary. Working along in this way, I did the main line from New York to Pittsburg, also going over some of the principal branches. It was necessary sometimes to build an elevated platform, in order to secure a foreground or get a view. This was especially the case at Cresson and the Horseshoe Curve, the latter being the show piece on the line, and never having been successfully made. I had built a special camera, which embraced an angle of nearly 170 degrees, the latter being necessary, owing to the nature of the view and natural surroundings of it. The principle of this instrument was an old one, but had not been successfully applied until a rapid gelatine emulsion, coated on either paper or celluloid, was made use of. M. Carey Lea, in his *Manual of Photography*, published in 1870, refers to a description of such a camera, published many years before. Panoramic cameras were advertised as being made in Paris, but the angle embraced would not cover the number of degrees required. I there undertook the building of one. A crude model of wood was first made and shaped in a half a circle, placing a Ross 15-inch portable lens in the centre of a revolving board in front. The rounded half back was covered with tissue paper, and an extension was made of cardboard from the lens. A handle on the top outside was attached to the board in front, in order to swing it. I was convinced it would work, and was favoured with the services of a friend who drew the working plans. These were taken to a well-known maker of cameras in New York, who declined to undertake the construction of it. The same friend agreed to superintend the building, and a number of unsuccessful attempts at flexible holders were made. I finally had the holders made of brass and the slides of celluloid. Quite a number of experiments were necessary before an even exposure was accomplished, but I continued this expensive practice until I succeeded. The greatest trouble in this class of work is difficulty in getting evenly coated films, the celluloid buckling while being coated, and allowing the gelatine to settle in pools. Owing to the waste thus produced, the cost is necessarily high. My camera was specially built to make large pictures of subjects embracing a wide angle, and within narrow limits. It is not so satisfactory in general landscape work, as only the one lens, to which it is adapted, can be used on it. It has, however, served me very well in making certain great bridges in the south and west, and again at Niagara Falls. My work on the Pennsylvania Railroad lasted from June until October, during which time I covered the line from New York to Pittsburg. Just previous to the World's Fair the same Company decided to display, in their exhibition building at Chicago, pictures of the industries along the line, also all terminals and freight stations and bridges. This was a great undertaking, but, having had experience by this time in railroad matters, I did not feel the same apprehension I did on the first venture. A similar car was fitted up and the start made from New York. Together with two assistants, both competent to handle cameras, we covered the entire system, with nearly all the branches, to St. Louis and Chicago. The plan of operation was different, as in most cases we located the car as conveniently as possible, and operated in various directions, coming back to the central point and continuing west—some days including a great many towns and cities. This work was begun in April, 1893, and in July a set of pictures was placed in the building in Chicago. A large number of these negatives were 18×22, the others $6\frac{1}{2} \times 8\frac{1}{2}$, enlargements being made from the latter.

In 1895, Mr. Chas. S. Lee, general passenger agent of the Lehigh Valley Railroad, awarded me the contract to photograph the scenery of that line. Mr. Lee fully knows the value of showing the beauties of the scenery on the line of a road, and was exceptionally liberal in equipping a car for me. The same general design for a car before mentioned was adopted, and, if anything, the comfort was greater, and the same methods were pursued. The platform on top of the car ran from end to end. My trip began at New York and ended at Niagara Falls, where I was specially fortunate in having fine weather. Of the resulting pictures the choice, of course, centres on but a few, which are used most largely, and examples of which I know have gone well around the world. The Lehigh Valley Company had more than 200 large pictures framed, and secured such places as the Union League Assembly Hall of this city, and similar places in the leading cities on its lines and connexions, as far west as Chicago, for exhibiting them. Special invitations were sent to the leading citizens to attend the Exhibition, where an orchestra was in attendance, and representatives of the Company were at hand to speak of the special merits of the road.

WILLIAM H. RAU.

PHOTOGRAPHIC EXHIBITION AT BEVERLEY.

THE Fourth Annual public Exhibition, arranged by the Committee of the Beverley Photographic and Sketching Society, was held in the Assembly Rooms, on Easter Monday. The opening ceremony was performed by the Rev. J. C. W. Burnaby, vicar of St. Mary's, who expressed astonishment at the magnitude of the Exhibition, and commented upon the high quality of the specimens shown. He also complimented the Committee upon the energy they must have displayed in getting together such a grand collection as they saw before them that day.

The entries largely exceeded in number those of last year, and included specimens from Australia, America, Switzerland, Scotland, and various parts of England. The exhibits were staged in tiers on stands draped with art muslin, and the effect was considerably enhanced by the introduction of a number of plants, and a quantity of bunting, kindly lent by Mr. C. J. Newbald. Among the exhibits not for competition were models of the Minster statues, lent by Mr. Smith, the sculptor; paintings by Mrs. Boyle, Mr. J. E. Elwell, Miss Winstanley, and Mr. T. B. Burton; a collection of thirty photographs from the Royal Photographic Society, London; twelve framed specimens of natural colour photography, lent by Sir H. Trueman Wood, of the Society of Arts, London. The attractions also included performances of animated photographs by Mr. A. Franks, of Hull and Manchester, an exhibition of prize lantern slides by limelight, promenade concerts, and refreshment bureau.

The Judges were: Photographs—Mr. E. J. Wall, London; and Rev. W. Hay Fea, Hull. Their awards are appended:—

OPEN CLASSES.

Landscapes and Seascapes.—Silver medal, J. H. Gear, London; bronze medal, Hugo Meynell, Cheadle; commended, F. A. Bolton, Oakamoor.

Architecture.—Silver medal, Edgar R. Bull, London; bronze medal, Alex. Fellows, London; certificate, George Hepworth, Brighouse.

Portraits, Figure Studies.—Silver medal, W. J. Anckorn, Arbroath; bronze medal, R. S. Webster, Edinburgh; certificate, T. Lee Syms, Tyldesley. There were thirty-two entries in this class, from all parts of Great Britain, and from the United States.

Hand-camera Work (six direct prints).—Silver medal, W. F. Ward, Bawtry; bronze medal, C. F. Inston, Liverpool; certificate, W. E. Cowan, Newcastle.

Snap-shot Enlargements.—Silver medal withheld; bronze medal, C. N. Wane, Edinburgh; certificate, J. Kearney, jun., Liverpool.

Enlargements (ordinary).—Silver medal, C. N. Wane; bronze medal, J. B. Briggs, Lancaster; certificate, H. Dowden, Bootle.

Scientific and Miscellaneous.—Bronze medal, J. F. Hammond, Wilmslow Park, Cheshire, for eight photo-micro prints; a second bronze medal was awarded to D. Hedges, Leytham, for animal studies; certificate, W. E. Lane, Walthamstow.

Lantern Slides (set of six).—Silver medals, Paul Martin, London, and E. R. Bull, London; bronze medal, Owen Hesler, London; commended, W. A. Frazer, New York.

MEMBERS' CLASSES.

Landscape, &c.—Silver medal, Mrs. W. Thompson, Molescroft; bronze medal, G. Dawson, Beverley; certificate, J. C. Cook, Beverley.

Portraiture and Figure Studies.—Silver medal, H. J. Mann, Beverley; bronze medal, G. Dawson; certificate, L. Haselhurst.

Excursion Work.—Silver medal, J. C. Cook; bronze medal, G. Dawson; certificate, J. W. Hooton, Bridlington Quay.

Enlargements.—Silver medal, A. E. Hobson, Beverley; bronze medal, G. Dawson; certificate, R. Railston Brown, C.E., Bridlington Quay.

Instantaneous Work.—Silver medal, Thos. Tanfield, Beverley; bronze medal, J. V. Kinsley, Bridlington.

Lantern Slides.—Silver medal, T. Tanfield; bronze medal, Rev. W. E. Wigfall, Beverley; certificate, J. Haselhurst, Beverley.

Our Editorial Table.

THE SANDELL PLATES AND FILMS.

The Sandell Works Company, South Norwood, S.E.

A FRIENDLY challenge to the esteemed managing director of the Sandell Works Company to send us a multiple-coated film which did not curl in development and necessitate an extra depth of developing and washing solutions led to our receipt of samples of the most recently prepared films and plates of the Company's manufacture. We were surprised at the lack of curl possessed by

the films. So soon as one is placed in the developer, the pressure of the thumbs and forefingers on the four corners of the film for a minute or two will ensure its resting as flat as a glass plate, and it will remain in that condition during fixation and washing. Besides the films, we have exposed and developed some of the Company's various rapidities of plates on test subjects, and have thus had the opportunity of confirming the powers of the plates of yielding non-halated negatives of admirable quality. Experience has undoubtedly helped Mr. Sandell to improve his method of manufacture, with the result that, though bearing two layers of emulsion, the plates and films fix in about the normal time, and dry with the average rapidity of ordinary plates and films. The Sandell Works Company unquestionably deserve congratulations on the fine qualities of their sensitive productions, the capabilities of which are well illustrated at the Exhibition now on view at the Company's offices, to which we made reference last week.

Edwards's Plates Backed with "Anti-halo."

B. J. Edwards & Co., The Grove, Hackney.

We are glad to find the long and freely tendered suggestion that the dry-plate makers should send out their plates ready backed has at length secured adoption. Messrs. Edwards recently sent us some of their plates which have been treated in this manner. The Easter vacation gave us ample opportunity for testing the anti-halative efficiency of the backing medium, which answered its purpose admirably. During development no inconvenience arises from the solubility of the medium, which does not stain the gelatine, and is easily removable from the back of the plate, by being placed under a tap of water or rubbed with a moistened rag or sponge. These backed plates of Messrs. Edwards appeal to all photographers, and should therefore secure a corresponding measure of popularity. Let us also note that the excellent qualities of Messrs. Edwards's sensitive productions are strongly evidenced in these samples of their latest manufacture — medium isochromatic and snap-shot isochromatic—which it was a pleasure to develop.

The Brilliant Developer.

Oscar Scholzig, 9, New Broad-street, E.C.

This developer possesses all the good qualities that are identified with the newer reducing agents; the solution remains colourless for a considerable length of time, it can be used for either plates or paper, and the negatives and positives it yields quite satisfy modern tastes in those directions. The Brilliant developer is sent out as a single solution, and is made ready for use by admixture with a ten per cent. solution of carbonate of potash. We note that the developer obtained a prize at the Berlin Exhibition. We append the formulæ for its use:—

For Negatives.

Distilled water, 10 ounces.
Pure carbonate of potash, 1 ounce. } 10 per cent. solution of potash.

Mix 1 ounce of Brilliant developer with 1 ounce of the potash solution.

If very soft negatives are required, the proportion of potash may be increased to five volumes of potash solution to one volume of Brilliant developer.

For Development of Bromide Paper.

The following proportions are recommended:—

Brilliant developer,	½	ounce.
Potash solution,	½	,,
Water,	1	,,

For softer results more water must be added.

Catalogues Received.

G. L. Hoffman, 28, Avenue-road, Acton.

Trade price-list of printing in carbon; platinum and silver; enlargements; bromide contact printing; finishing; retouching, &c.

Harrington Bros., Oliver's Yard, 53A, City-road, E.C.

Wholesale price-list of chemicals used in photography, for April, 1897.

Thomas Illingworth & Co., Rucklidge-avenue, Willesden Junction.

Trade price-list of enlargements in bromide, carbon, and platinotype; finishing in monochrome, oil, and water colours; printing, &c.

News and Notes.

Messrs. J. J. Griffin & Sons, of 22, Garrick-street, Covent Garden, inform us that they are now supplying polished metal plates for photo-engraving.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, May 5, at eight o'clock. Trade Night. Manufacturers or dealers wishing to exhibit novelties, please address the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.).

Photographs of Sound.—Dr. Bleyer, of New York, publishes some novel "photographs" of sound. According to the New York correspondent of the *Standard*, any tone produced before the small end of an upright funnel originates vibrations in a sensitive horizontal membrane covering the other end. These are reproduced in a tiny dancing drop of a coloured liquid, and reflected in a mirror, before which passes a continuous film like that of the familiar living photographs. Theoretically, a photograph of an opera might be made, resulting in forms curious, but always symmetrical, beautiful, and sometimes resembling flowers, though others take geometrical curves.

"I expressed the opinion in my last letter," says F.R.A.S. in the *English Mechanic*, "that the Royal Astronomical Society, among others, would be particularly cautious in identifying itself with the charming little scheme suggested under the style and title of 'the Victorian Research Fund.' I now learn that, at the meeting of that Society on the 9th instant, not one syllable was uttered by the President in connexion with this latest attempt of the Research for Endowment gentry to get their hands into other people's pockets. Of course, no outsider can learn what passes at the Council meetings, save by subsequent perusal of the formal minutes, but it certainly does seem to me in the highest degree probable that, had our Council entertained the slightest idea that the proposed fund would in any sense or way be beneficial to science, there would, at all events, have been some notice from the chair calling attention to it, and inviting such of the Fellows as approved of it to send in their subscriptions. I have heard of no more eloquent condemnation of the whole affair than that to be found in Sir Robert Ball's absolute silence."

South-Eastern Union of Scientific Societies.—The Second Annual Congress will be held at Tunbridge Wells on Friday and Saturday, May 21 and 22, 1897. The President is the Rev. T. R. R. Stebbing, M.A., F.R.S. The meetings will be held in the Town Hall, Calverley-road. Friday, May 21, 3.30 to 5.30 p.m., General Meeting. President's Address. (1) *What can be Done to Save our Fauna from Unnecessary Destruction?* Rev. J. J. Scargill, B.A., Bromley Nat. Society, and A. Rose, North London N.H.S.; (2) *How can the Technical Education Grant Assist Local Scientific Societies?* S. Atwood, New Brompton N.H.S., and J. W. Tutt, F.E.S.; (3) *Local Museums; Practical Observations on Objects and Methods*, W. Cole, F.L.S., F.E.S., Hon. Secretary Essex Field Club, and E. A. Pankhurst, Brighton. The Mayor's *Conversazione* will be held in the Town Hall, 8 to 10.30 p.m. Saturday, May 22, 9.45, Council Meeting; 10.15, General Committee; 11 a.m. to 1.30, General Meeting. (4) *The Committees of Field Clubs*, Professor G. S. Boulger, F.L.S., F.G.S.; (5) *Current Bedding in Clay—Section at New Athletic Ground, Tunbridge Wells*, Professor H. G. Seeley, F.R.S.; (6) *Search for Coal in S.E. of England*, H. E. Turner, B.Sc., B.A., and W. Whitaker, F.R.S.; (7) *History of the Weald in Special Reference to the Age of the Plateau Deposit*, W. J. Lewis Abbott, F.G.S. Saturday, 3 p.m., excursions.

Metallic Spots on Prints.—"Occasionally, when working papers or films, troubles crop up which, on account almost of the very simplicity of the explanation, are difficult to overcome. The following, which came under our notice some time ago," says the *Kodak News*, "is a case in point. At a photographic establishment, much trouble was for a time experienced from minute brown spots in the gelatino-chloride paper used, which would appear during the process of toning when using the separate toning and fixing baths. Before toning, the prints would be perfect. However, on immersing them in water, small brown spots would begin to make their appearance, and in the subsequent process of toning they would go black the same as the image. They never showed if the prints were immersed directly in a combined toning and fixing bath. Various causes were sought for; amongst others, metallic impurities in the wash water. However, the spots still continued to make their appearance in greater or less numbers, even when distilled water was used. Eventually it was discovered that they were due to metallic dust particles, which had accumulated underneath the iron pulleys over which the ropes of the window sashes in the printing galleries travelled. In windy weather this dust got blown down on to the paper when the printing frames were opened for the purpose of examining the prints. The particles were excessively minute, but, on immersing a print in water, each little iron particle commenced to reduce the soluble silver salts in the paper in its immediate neighbourhood, thus producing a halo of fine brown silver deposit. The trouble was at once stopped by carefully removing the metallic dust in the printing gallery, and by soaking all prints intended for the sulphocyanide bath toning in a solution of salt instead of in plain water. This, of course, converted the soluble silver salts into insoluble silver chloride, which was not reduced by the iron particles. With the combined bath, of course, the trouble had not been experienced, because, on immersing each print in it, the silver salts were fixed out before the iron particles had had time to act on them."

Scientists and Inventions.—*Engineering* recalls the fact that in the past scientific men have been very reluctant to take out patents for the discoveries attending their labours, a course which has undoubtedly tended in the direction of a diminution of the financial results of their work, others having stepped in and reaped the harvest. It is pointed out that scientific men of the old school considered it derogatory to take out patents for their discoveries, whilst those of the newer *régime* have no hesitation in doing so. It is to be feared that this feeling is a remnant of the ancient superstition that it was lowering the dignity of philosophy to apply it to the benefit of the race.

The application by Archimedes of his vast inventive faculties to the construction of engines of war was only held to be excusable in that he was swayed by motives of patriotism. Coming to recent times, remarks our contemporary, we have heard even leading Cambridge men censure our greatest physicist for the immense share he has taken in the practical development of electrical engineering by his numerous patented inventions. All experience shows, however, that, as the late Sir William Siemens remarked, "if a good idea were lying round in the gutter free to all, it would pay the community to make a present of a patent for it to any man competent to work it." Professor Hughes did not patent the microphone, meaning to leave it free to all. The only result was that others patented microphone transmitters for telephones and reaped the harvest which would otherwise have come to him. Again, M. Moissan, whose researches on the electric furnace have only enhanced a reputation already established by his historical work on fluorine, discovered, amongst the by-products of the aforesaid furnace, compounds of carbon with boron and silicon. The former in particular is excessively hard, and should form a magnificent abrasive. On the other hand, quite independently of M. Moissan, Mr. George Acheson also discovered the carbo-silicon compound. Unlike M. Moissan, however, Mr. Acheson did not merely record the scientific fact of the discovery, but patented the process, with the result that, whilst the former's work has not directly benefited humanity by one atom, the latter is now turning out carborundum grinding wheels by the hundred, and has established works at Niagara in which 4000 pounds of the material can be produced by one furnace in twenty-four hours. These electric furnaces are the largest yet constructed, being sixteen feet long by five feet square.

Eastman Photographic Materials Company.—An Extraordinary General Meeting of the shareholders of the Eastman Photographic Materials Company, Limited, was held on Friday, April 23, at Winchester House, E.C., under the presidency of Mr. Andrew Pringle. Mr. J. M. W. Bennett (Acting Secretary) having read the notice convening the meeting, the Chairman said: "It will not be necessary for me to take up much of your time to-day. As the negotiations proceeded between your Directors and Mr. Eastman, no alterations were necessary in the terms which were proposed and stated to you at the last extra general meeting; but it was put to us very strongly by the counsel whom we engaged that it was necessary to lay before you in precise terms the nature of the proposed contract. This is, of course, a very great advantage; it costs us a great deal more trouble, certainly, but it is a very great advantage that every one of you has had the exact terms of the document before you for a certain number of days, and consequently you will, I doubt not, have made yourselves wholly conversant with its terms. That is one reason why I think it will not be necessary for me to take up your time to-day. At the same time it should be quite clearly understood that, if any gentleman present wishes to ask any questions with regard to the document before you, it will be our pleasure to give such answers as we are able. I now beg to move: 'That this meeting of the shareholders of the Company hereby approves and sanctions the sale by the Directors to Mr. George Eastman, of Rochester, New York, of the undertaking and property of this Company upon the terms and subject to the conditions set forth in the draft contained in the printed document which is now submitted to, and is approved by, this meeting, and which, for the purpose of identification, is subscribed by the Chairman thereof.'" Mr. W. H. Walker seconded the motion. The resolution was then put to the meeting and unanimously agreed to.—A meeting of preference shareholders was afterwards held, at which the Chairman moved: "That this meeting of the holders of preference shares of the Eastman Photographic Materials Company, Limited, hereby sanctions the provisional agreement submitted to this meeting, which agreement is dated April 12, 1897, and made between Joseph Thatcher Clarke, purporting to contract on behalf of himself and all other holders of the said preference shares of the one part and the said Company on the other part, and assents to the modification of the rights of the preference shareholders to be affected by the said agreement." Mr. Whatton seconded the motion, which was agreed to; but a formal poll was taken in order to show that the holders of two-thirds of the nominal capital were in favour of the resolution. There was stated to be an ample number of votes for that purpose.—A meeting of the ordinary shareholders was afterwards held, at which a similar resolution was adopted. The proceedings closed with a vote of thanks to the Chairman.

The Use of Large Telescopes in Astronomy.—The Americans have never looked with a favourable eye upon telescopes of the reflecting kind. All their efforts, therefore, have been in the direction of increasing the size of their object-glasses. On the other hand, Englishmen have usually adopted the reflecting form of instrument, and many of the principal discoveries effected in this country have been due to this kind of telescope. In the hands of Herschel, Lassell, and Rosse, these instruments have done splendid work, but in late years the Americans can fairly claim to have made the greater number of important discoveries with their refracting telescopes. In 1877 two satellites of Mars were first seen at Washington with an instrument of 26-in. diameter, and in 1892 the fifth satellite of Jupiter was revealed by the 36-in. glass at the Lick Observatory in California, and we may reasonably anticipate that the chief discoveries of the immediate future will be made in the United States. It is true we have some large instruments in England. Besides Lord Rosse's 6-ft. reflector at Parsonstown, Ireland, there is Mr. Common's 5-ft. reflector at Ealing, London, the 28-in. refractor at Greenwich, and Mr. Newall's 25-in. at Oxford. But it would certainly be rash to expect anything great in the way of new discoveries from these, because it does not appear that they have been placed under the direction of men who have shown special observational capacity. In America large telescopes are becoming quite numerous, for our transatlantic cousins evince a more enterprising spirit and a more generous regard for scientific investigation than ourselves, and this has prompted them to devote large sums to the building of observatories and the manufacture of gigantic telescopes. The 40-in. glass, which is now approaching completion for the Yerkes Observatory, will be the largest of its kind in existence, and, as it is to be placed in the hands of some of the most able practical astronomers in the States, the outcome is likely to be very successful. It is found that the best work is usually accomplished, as we should naturally expect, by the combination of a good observer and a good telescope. It is curious that Lord Rosse's great instrument was in use for a whole generation before the two satellites of Mars were discovered. Had a proper examination been made for these bodies, it is extremely probable that they would have been seen by the Parsonstown telescope; but it does not appear that a thorough search was ever instituted. The two satellites would have been easily visible in about the years 1847, 1860, and 1862, when Mars was near the earth, had a competent observer looked for them; but the chance seems to have been neglected, and America has the credit of having effected the important discovery. Perhaps, also, the fifth satellite of Jupiter might have been discovered in England had a really good eye and powerful telescope been combined in the search. There is a great distinction in the conditions under which astronomy is pursued in England and America. In the latter country the people seem imbued with a desire to advance science, and particularly astronomy, which, it is admitted, is the most sublime study upon which man can enter. Large bequests have been, and still are being, made for the erection and equipment of observatories and mounting of large telescopes. When an American has amassed a fortune of a few million dollars, it is usual to find him devoting a part of his wealth to the advancement of astronomy, or directing that it may be so applied after his decease. Scores of instances might be quoted where private individuals have given large sums for the furtherance of the effective study of this science—in other words, for the increase and diffusion of our knowledge of the greatest works of the Creator. In England such a thing has been rarely known. The British millionaire seeks to do good and to earn a character for generosity by other channels. He gives his money to charity—he becomes the founder of a hospital, he presents a public park to his native city, or gives it a free library. Perhaps that is just as well. Some people may even think it a better method of disposing of surplus wealth than in providing the means to set men star-gazing. But, in spite of any such opinions as these, the striking fact remains that in some of our most populous and opulent cities, where hundreds of magnificent buildings have been erected for various public uses, there is not so much as an old hut standing anywhere to assist in the study of the glorious works of God. In touching upon this question as a curious exemplification of our taste at the close of the nineteenth century, I have done so in explanation of the fact that America possesses a far greater number of large telescopes than England, and that, as a natural consequence, nearly all our astronomical discoveries come from the United States. America, indeed, owes the proud position she holds in the astronomical world to-day to the munificence of her citizens, while England owes little or nothing to a similar cause. The near future will see much larger instruments erected than any hitherto employed; but it is questionable whether they will be much more serviceable or more effective as a means of discovery than smaller ones. It might be supposed by some that the efficacy or capability of these appliances increases in the proportion of their size; but this is very far from being the case. The distinctness of the images in a large glass is generally not so good as in a smaller one, owing to the unsteadiness of our atmosphere; but, notwithstanding the objections to their employment, it is fair to suppose that at no very distant date we shall have refracting telescopes of 50-in. or 60-in. diameter, and reflectors of 120-in. or 130-in. aperture in actual use. The construction of such leviathan machines is by no means impossible; but the cost will be immense, and the utility of enlarging them to such dimensions is at the best questionable.—W. F. Denning, in The *Bristol Mercury*.

Patent News.

The following applications for Patents were made between April 14 and April 21, 1897:—

Cameras.—No. 9296. "Improvements in Photographic Cameras." S. Ritter.

Developing Dishes.—No. 9574. "Improvements in and connected with Photographic Developing Dishes and the like." J. Ritchie.

Metallic Carrier.—No. 9703. "Improved Double Metallic Carrier or Slide for Photographic Plates." Complete specification. E. Wünsche.

Advertising Frame.—No. 9814. "Photographic Advertising Frame or Improvements in Displaying of Advertisements." M. Fabbrucci.

WHO SHALL BE HEN-WIFE.

"Na ye maun gang wi' me the noo, Wullie" (his name was Charles), said Henrietta, as she flung a brawny arm round the lad's neck; "sure my friend Jemmie's as Scotch as they make 'em."

"Na, na, lass; I maun gang wi' Wilhelmina, an' my name's no Wullie—hang it!—and ye need nar gar me a crick in my—what do you call it in this lingo?—craig. Your fren' Jemmie's a fause loon; didna she deceive the kirk and get the mickle rebuke o' the meeneester?"

"Then ye'll no mair keep company wi' me (hang this jargon!)" said Henrietta, who was English, and found Kailyardish trying.

Said Charles, "I care no for ye, an' I ne'er lo'ed ye nor e'r any but the Scots lassie Wilhelmina.

"You're a rude little boy," said she.

"Stay y're havers, and no clack like siccan," said the Chem. Soc., afflicted by the *genius temporum*, and involuntarily speaking the lingo.

"An' why shall we no have a bit clavers? Sair, I ken I'm as winsome as Jemmie," said Wilhelmina, as she tried to pull Wullie to her side.

"Bide a wee," said a voice. It was Jemmie's.

There was a confused struggle; Wullie squealed and kicked, the Chem. Soc. awoke with a start, and found Jemmie installed as hen-wife, and the kailyard resuming its normal gentlemanly demeanour.

Ian McCrockett, *in the Chemical News*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
3–7	Camera Club	Annual Conference.
3	North Middlesex	Informal Meeting.
3	Putney	*Practical Pictorial Photography.* A. Horsley Hinton.—Annual General Meeting.
4	Aintree	Local Views.
4	Brixton and Clapham	*Negative-making.* Chapman Jones, F.I.C., F.C.S., F.R.P.S.
4	Gospel Oak	*Lantern-slide Making (Contact and Reduction.* Messrs. Morris, Pridham, and Rayner.
4	Hackney	*Architectural Photography.* C.H.Oakden.
5	Edinburgh Photo. Society	*Shakespeare's England.* J. G. Patterson.
5	Photographic Club	Trade Nght: Novelties, &c.
5	Southport	Developing and Printing Competition.
6	Bradford Camera Club	*Printing and Toning.* A. Coe.
6	Leeds Photo. Society	*Weights and Measures.* B. A. Burrell, F.I.C.
6	London and Provincial	*The Colour of the Negative Deposit.* Herbert S. Fry.

ROYAL PHOTOGRAPHIC SOCIETY.

April 27,—Technical Meeting,—Mr. A. Haddon in the chair.

Glass-blowing.

Mr. T. Bolas, F.I.C., F.C.S., gave a demonstration of glass-blowing at the lamp, with reference more particularly to articles of use in photographic and chemical laboratories. The demonstration, which was thoroughly practical and most minute in its character, was followed with much interest by an unusually large assemblage of members and visitors. Mr. Bolas did not read a paper, but treated the subject in a conversational manner in the course of his work at the blowpipe. Glass, he said, was remarkable from its possession of two opposite properties, being perfectly elastic at ordinary temperature—as shown by a spring of glass tubing—and becoming plastic and viscous at a low red heat. In the plastic condition it had a tendency towards a spherical form, and it was shown that, when two shapeless masses of black and white glass, in this state, were twisted together, they formed of themselves a fairly true spiral of parti-coloured glass, the great art in working glass being to use no art, but to let nature and natural forces assert themselves. If a rod of glass was softened in the middle and drawn out quickly, it would form a fine thread; but, if drawn out slowly, the thin part would begin to chill, and the thicker parts which had not chilled would then be reduced in thickness, and an approximately parallel red would be produced. Any kind of glass could be worked at the lamp, but it was most convenient, although not essential, to use tubes or rods, and the two most suitable varieties could be readily obtained in these forms. These were the soft German soda glass, containing little or nothing but sand and soda, and the so-called "flint" glass, containing a great deal of oxide of lead. Several commercial blowpipes were shown and explained, and Mr. Bolas said that the laboratory blowpipe, as ordinarily sold, was totally unfitted for glass-working, and he showed one which he had made himself by which the jet could be adjusted within wide limits to suit the particular purpose in view; for flint glass working the burner should be turned down until the flame was nearly solid, the outer part being of a peculiar purplish appearance. By melting a piece of soda glass in a ring of platinum wire one could make a lens of very good defining power as a magnifier for small objects, and Mr. Bolas made such a lens by means of which the Lord's Prayer could be easily read on a micro-photograph covering an area of about one-sixteenth of an inch. If formed of flint glass, however, the lens would contain striæ of unequal density, and, although having a very brilliant appearance, would be practically useless. This experiment illustrated the natural tendency of the glass to form a sphere, the sphere being deformed by the action of gravity, and assuming a paraboloid shape, which defied opticians. Syphons and syringes were among the many things of use to photographers which could be made of glass by means of the blowpipe. The ordinary syringe, packed with cotton, was not satisfactory for chemical purposes, but the cotton could be suppressed, and a glass syringe could be made in which the tightness depended upon an annulus of water, held by capillarity between the piston and the cylinder. Various forms of syphons and pumps, for drawing off acids, &c., were made and explained. The methods of making red glass with cuprous oxide and gold were referred to, and it was stated that the so-called "gold-pink" glass, coloured with gold, was useless for dark-room illumination, as it allowed a great deal of blue to pass; the little-known process of colouring by cementation was also referred to. The peculiarities of dichroic glass were demonstrated, and Mr. Bolas alluded to the fact that the importance of baryta glass for optical purposes was originally recognised by an Englishman, Mr. Alfred Dawson, who first made the material now known as Jena glass, but he said it was impossible not to realise the fact that the French and Germans were greatly ahead of us in delicate kinds of glass-working. He showed the manner of manipulating the blowpipe in many directions, the proceedings being prolonged until much past the usual hour, for which he apologised by quoting the words of the poet to the effect that,

> "Although by no means clever,
> I could talk like this for ever."

The audience, however, disagreed with the first of these assertions, and signified their appreciation of a clever and successful demonstration by according Mr. Bolas a very hearty vote of thanks.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 22,—Mr. A. Haddon in the chair.

Mr. P. Everitt passed round a Daguerreotype stereoscopic slide which h stood the test of time very well, being in an excellent state of preservation.

Animated Photographs.

Mr. Birt Acres prefaced his display of moving pictures with a sh history of the development of that branch of photographic knowledge. thought he could assert that he was much more forward than when he l spoke upon the subject before the Association. During the interval he h devoted his attention to the manufacture of the base material itself, the fi previously obtainable being very unsatisfactory in more directions than o and he considered he had met with considerable success. Years ago he h drawn pictures for the old fashioned instrument then in use, and, later on, h worked by means of photography to the same end. His camera was fitt with twelve small lenses, giving a similar number of pictures. The subj was dropped then for years until Muybridge came over from America, wh he again worked at it, although without much success. However, in 1893, took out a patent which attracted but little notice, but which was for apparatus for taking and showing pictures in rapid succession, and he ratl prided himself upon this date. He was actually the first to take scenes current events (not the specially got-up scenes), and the first historical eve he had photographed was the University Boat-race of two years ago. Tl year he had also made an attempt on the same event, but the weather was very bad that he despaired of getting anything but a poor result. Mr. Ac proceeded to sketch upon the board the mechanism of his apparatus, drawi attention to the device for producing the necessary intermittent motion of t film without stopping the machinery, thereby avoiding a great deal of the j and shaking which would follow the latter course. He originally used spring to deflect the film and produce this effect with fair success, b eventually he abandoned the spring for a direct eccentric motion. As regar the future, he felt certain that animated photography had as much futu before it as the optical lantern we see every day; but there was one thing, must get over the brutal flickering upon the screen. During the last fe months he had perfected a piece of apparatus which he expected much from this respect. With reference to the size of the image, he was in favour keeping to the present, for, by doubling the size of the picture, you likewi double the initial cost of the film, which is high enough at present. It wou also be found that larger pictures could not be so rapidly taken as the small ones. In conclusion, Mr. Acres hoped to shortly put before photographe an apparatus that could be used by any photographer, and in which the wor difficulties would be overcome.

The large attendance which this event had brought together were th entertained with a display of these exceedingly lifelike representation including the Great Northern mail train catching the post bags at Barnet; train passing through Highgate Tunnel; a boxing match in two rounds; t practising for the boat race, taken from the stern of the *Hibernia*, steaming between twenty-two and twenty-three knots per hour; the waves at Dover; &

Mr. Acres added that with his apparatus he was not limited to the leng of a film, but by the capacity of his camera. He proposed to have enou film in his camera, on the occasion of the forthcoming Diamond Jubil Celebration, to last between two and three hours. with which he wou photograph selections of interest. He also expected to be able to show t same in natural colours.

Henderson Competition.

The competition slides for the Henderson award, consisting of three sets twelve each, were thrown upon the screen, but the Judges (Messrs. R. Becket J. S. Teape, E. J. Wall, and W. D. Welford) withheld the award, not feelin justified in bestowing it upon the work entered.

The Chairman proposed a vote of thanks to Mr. Birt Acres for his kindne in showing them his photographs, which was carried with applause.

PHOTOGRAPHIC CLUB.

Mr. Frank Haes in the chair.

The minutes were read and confirmed.

Mr. Foxlee showed the Daguerreotype which he had renovated at previous meeting. Fitted with a new cover glass, the photograph looked bright and fresh as originally. An erosive action upon the surface of the o cover glass, which was passed round for inspection, was very obvious.

It was announced that the date of the opening of the Exhibition at t Crystal Palace had been put forward from April 24 to May 6.

Mr. W. D. Welford handed round a series of six hand-camera shot illustrating the *The Posting of a Letter*. The pictures describe the adventure of a pretty little girl, a letter, and a big policeman. The conceit is quain and admirably carried out.

Mr. Hills showed a series of slides made by Mr. Reid, of Wishaw. Thes were mainly pictures of animals, and were characterised at least as much b their artistic qualities as by their photographic excellences. Perhaps the bes of all were some photographic "thumb-nail sketches" of wild birds on trees taken at close quarters.

The Exhibition of the slides was appreciated by the members of the Club and their sentiments were expressed by Captain Hayes, who proposed a vot of thanks to Mr. Reid, and by Mr. Foxlee, who seconded the motion.

Mr. Hills thanked the members for the expression of their appreciation He added that he sometimes found himself regarding photography from different standpoint to some of his fellow-members, but he was at one wit them in experiencing pleasure whilst looking at Mr. Reid's work.

Mr. Frank W. Dowell was proposed as a member of the Club.

April 21,—Mr. Thomas Fall in the chair.

Mr. W. Thomas, of Herne Hill, was unanimously elected a member.

The subject of the evening was

Reminiscences of American Photography,

by Mr. George Hana, the well-known theatrical photographer, who gave

ery lucid and interesting description of work in the United States, the ifference of apparatus and material, &c. He also showed some very excellent rints from negatives of his own, taken in Chicago, of public buildings, oulevards, and parks, which raised some discussion on American architecture.

A vote of thanks was passed to Mr. Hana in appreciation of his kindness in ttending and so thoroughly interesting the members with a subject so difficult o handle.

Mr. FALL promised to show some pictures by Sarony, of New York, on May 26.

Bradford Camera Club.—April 22.—Mr. W. W. ABBOTT gave a most instructive lecture on

DEVELOPMENT.

Mr. S. W. Scarlett presided. The lecturer described the action of various developers, and practically demonstrated the process on several plates. The lecturer was accorded a hearty vote of thanks. After the lecture there was an auction sale. Mr. Walter Booth (President) sold a quantity of apparatus belonging to members and others, and a variety of articles changed hands and fetched fair prices.

Leigh Photographic Society.—This Society held a most successful Members' Exhibition on Tuesday and Wednesday last in the Grammar-school, which was largely attended. The Committee had arranged the exhibits in a very effective manner, and the display was highly creditable to all concerned. Great interest was taken in the Exhibition, and the work shown was greatly admired. Mr. Miles F. Burrows (the esteemed President), Mr. T. J. Green, Mr. W. Hampson, Mr. Haddock, Mr. R. C. Tweedale, Mr. A. Rose Moore (the Secretary), Mr. P. Seddon, Mr. S. Peters, Dr. Jos. Jones, Mr. H. H. Wragg, and Mr. Leigh's exhibits are deserving of especial mention. A feature of the Exhibition was undoubtedly the work of Mr. T. Lee Syms, who showed a number of his celebrated *genre* pictures, most of which are well known to the photographic public, and have been exhibited at most of the principal exhibitions. The whole of the work shown was excellent. Each evening a lantern show was given, Mr. P. Seddon being the manipulator, and slides of the members were exhibited. The Society have decided to hold it annually. The last Exhibition was in 1894.

Sheerness Camera Club.—This Club held an Exhibition in connexion with the Sheppey United Football Club Art Loan Exhibition, on Easter Monday, Tuesday, Wednesday, and Thursday. Members' prints, negatives, and apparatus, &c., which were very attractive, were exhibited. Messrs. Marion sent for exhibition six large framed specimens of their celebrated plates and papers, a Perfect developing dish, samples of their adhesive cloth (Sweetheart), and show-card of their Swallow camera (hand). Messrs. Wellington & Ward, prints on P.O.P. and bromide paper, which were much admired. The Paget Prize Plate Company, Imperial Plate Company, Austin Edwards, and Messrs. Pivot sent specimen prints, printing-out and bromide papers, &c. Radiograph prints were also exhibited. The Exhibition was well attended, and was opened on Monday by the wife of Vice-Admiral Nicholson, and on Tuesday by Mrs. Gorrell Barnes, wife of Mr. Gorrell Barnes, M.P. for East Kent.

FORTHCOMING EXHIBITIONS.

1897.	
April 30, May 1	*Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, W.S., 2, George-street, Edinburgh.
December 9–11	*Aintree Photographic Society.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE FIRST PHOTOGRAPHIC USE OF THE TERM HALATION.

To the EDITORS.

GENTLEMEN,—Referring to Mr. Marlow's letter, all old photographers will remember this gentleman's classic papers, in which he described halation and its cause, read before the Photographic Society of London in 1861. These were among the most important contributions to our literature, but what Dr. Murray required for his dictionary was a reference to the *earliest use* of the term *halation*. This I was enabled to supply to him immediately after the publication of your paragraph drawing attention to the want, and it was earlier than Mr. Marlow's.

In the journal of the Photographic Society for November 15, 1859, may be found a letter from a Mr. G. W. Perry, dated Melbourne, describing a fault he has met with in his negatives. He speaks of "the peculiar appearance to which, until a better one is found, I have applied the term *halation*."—I am, yours, &c. H. P. ROBINSON.

Tunbridge Wells, April 24, 1897.

THE PROFITS OF PROFESSIONAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I was much interested in your financial estimate of a photographer's business in your last week's issue.

The total amount of the expenses is fairly correct, according to my calculations, only some items are put down at too high a rate and others rather low. For instance, a business doing only 1000*l.* a year should not consume 60*l.* worth of plates, 40*l.* would be ample; on the other hand, printing papers and carbon tissues I would place at 50*l.* instead of 25*l.*

There is one important item, however, which has been omitted; nothing has been allowed for bad debts. In a high-class provincial business, at all events, you must give credit, in which case an allowance of five per cent. for bad debts is not too much.—I am, yours, &c.,

April 21, 1897. J. M.

PRICES AND THE ASSOCIATION OF MANUFACTURERS.

To the EDITORS.

GENTLEMEN,—The Photographic Plate-manufacturers' Association has been formed, and it is making itself felt by laying down hard-and-fast rules for the photographer to buy; and, as there are always two sides to a question, it remains to be proved whether this act on the part of the Association will benefit the fifteen firms, or in the end benefit the much-trodden-down photographer.

The Association has been formed, says their circular, to protect the *bonâ-fide* dealer, or, in other words, the *chemist*, who is, no doubt, jumping for joy to think the manufacturers have gone to so much trouble for his benefit. The Association has, in all probability, not taken into consideration that it rests with the photographer whose plates, paper, &c., he uses, whether English or foreign-made, although we ought not as a body to go in for German-made material.

Any one can have dealers' terms from the fifteen firms belonging to the Association, no matter what his business may be, so long as he is not a photographer; but who is it that the Association looks up to? Every photographer knows it is the chemist who gets the extra profit on photographic material. Why? can be asked, but the only answer that can be made is that he has a good business at the back of him, and he gets this twenty-five per cent. by simply ordering what you want. Does he stock it? No; although he orders but a few shillings' worth, he gets the full discount, but the photographer, although he orders as many pounds' worth, gets nothing. Is this fair to the consumer?

The Association has not taken into consideration the German houses that are just now pushing their material all they know how into England. Only yesterday brought me by post a price-list of paper, plates, &c., much below any of the fifteen firms, and, on top of that, forty per cent. carriage paid. It is a question if the manufacturers have been, as your last week's correspondent said, wide awake; I think they will find out their mistake when it's too late for them to intervene. I know one (photographer) dealer, who, upon being struck off dealers' terms, as he was a photographer also, simply sent direct abroad for 50*l.* worth of photographic material, and is selling it much below any English make, and the material is simply splendid; having used some myself, I can vouch for the quality.—I am, yours, &c., PHOTOGRAPHER.

To the EDITORS.

GENTLEMEN,—In your last issue "An Old Professional" made timely remarks *re* above subject, and has given us a tip which I, for one, will not be slow to make use of.

For some time past plate-makers and dealers have been accumulating fortunes, while the hard-working photographer has been striving to make ends meet. In other words, they have been thriving when the photographers have been failing, and now, when prices are lower and competition greater than ever—now, when so-called amateurs are flooding the market with cheap rubbish—now, when the professional photographer is fighting for the preservation of "Art and Excellence" against the spread of daubs and caricatures—now, when the plate-makers, above all, should work hand in hand with them—behold, the everlasting (?) middleman (who generally skims the cream off the milk) prevailing upon makers to cut off the discount from professionals in order to put it in their own (dealers') pockets!

This is a first-class opportunity for a good plate-maker to come to the front, and gain the sympathy and support of professional photographers generally, by supplying professionals, direct only, with good plates at the lowest possible price for "cash with order." The first to do this will certainly succeed beyond his expectations.—I am, yours, &c., T. M.

April 23, 1897.

To the EDITORS.

GENTLEMEN,—It is probably too much to expect that photographers should take combined action to resist the action of a ring of plate-makers; but perhaps some good may result from the individual action of those who are called upon to pay an increased price for the first necessary of their business.

When the present price of plates was "set" some years since by one of the large manufacturers, the cost of silver was considerably heavier than at present, so that photographers might naturally expect rather a reduction than an increase in their expenditure for their plates.

To photographers in a large way of business, who have accounts entitling them to the maximum discount now permitted, the new conditions may not make much difference; but to those who do not run accounts at all, but pay cash for all they require, it is very hard.

"Rings" and "corners" in various lines have sometimes led to the increase of profits for a time to the capitalists who formed them, but in the end the principles of freedom in trading action have generally succeeded.

For my own part, I would, even if obtaining no advantage in price, prefer to use plates made by those who do not join in this "ring," and if, as I expect, I find myself fairly satisfied with a fresh make, I shall not be inclined to return to those who have acted in a manner so contrary to the principles of AN OLD FREETRADER.

"NO TOUTING, NO COMPLIMENTARY SITTINGS."

To the EDITORS.

GENTLEMEN,—"Free Lance," in your issue of April 23, hits the nail straight on the head in the pregnant and pertinent question which he puts to Mr. Thomas Fall anent the "Model Photographer," who is "determined to maintain prices equivalent to the work." (*Vide* Mr. Thomas Fall's panegyric in the JOURNAL of April 16).

I shall watch with some curiosity for Mr. Fall's reply to the following query put to him by "Free Lance": "Does this gentleman, or does he not, run other studios under a different name and at what may be termed cutting prices?"

I will answer the question myself for Mr. Fall; of course, he does. Now, Mr. Fall, what have you got to say?—I am, yours, &c.,

April 26, 1897. ANTI-HUMBUG.

INTERNATIONAL TRADE AND TECHNICAL EXHIBITION, 1898.

To the EDITORS.

GENTLEMEN,—I should be glad if you would make known through your columns the fact that the Council of the Royal Photographic Society is calling a meeting of the trade, to be held at 12, Hanover-square, W., on Tuesday, May 11, at 3.30 p.m.

The circular calling the meeting gives an outline of the International Trade and Technical Exhibition which the Society proposes to hold at the Crystal Palace next spring, and invites an expression of opinion from the representatives of the manufacturers and dealers upon the subject. If this be favourable, the meeting is asked to appoint three delegates to represent their interests on the General Committee of the Exhibition.

Exhibitors will incur no risk whatever in connexion therewith, their liabilities being limited to the charges for floor and wall space, which will be at the rate of one shilling per square foot for the floor, and sixpence per square foot for the walls, and no effort will be spared to make the Exhibition a complete and representative collection, fully illustrative of the development and present position of photography in its widest sense, such as up to the present has never been held.

In case any firm of manufacturers or dealers in photographic, photomechanical, and kindred trades should have been accidentally omitted from the list to whom the circular is being sent, a post card addressed to the Secretary, 12, Hanover-square, W., will secure a copy by return. Those unable to attend are invited to express their views in writing, sending them in an envelope provided for the purpose, which envelopes will be placed, unopened, in the hands of the Chairman elected by the meeting.—I am, yours, &c., H. WILMER.

The Royal Photographic Society, 12, *Hanover-square, W.*,
April 23, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Edgar Allan Basebe, 234, Mill-road, Cambridge.—*Photograph of undergraduates excited with drink, clergyman (father of host) and wife appearing in doorway, entitled "Unexpected."*

F. C. S.—Collotype.

SUBURBAN.—Yes; you had better communicate with the local district surveyor.

STEREO.—If the size is not listed by the dealers, we should recommend it being ordered of Allan, Whitfield-street, W. We presume a metal one is meant.

C. STUART.—Denison's work on *Photogravure*, published by Messrs. Iliffe Son, St. Bride-street, E.C.

E. HUNT.—Yes; you would undoubtedly run the risk of an action for fringement of copyright.

F. FOX.—There is a book on the subject by Mr. W. E. Woodbury, obtainal through the dealers, which will, no doubt, suit you. Our volumes five, six, and seven years ago contain many articles that also treat of i

BLACKING STOP.—W. WALKER asks: "Will you kindly say the best way blacken Waterhouse diaphragms?"—This query has been answer many times recently. Only last week a correspondent was answere and to that reply Mr. Walker is referred.

BROMIDE PAPER.—H. COX. The mysterious markings are readily account for. The paper has been slightly fogged by exposure to light, except the "mysterious markings." There it has been shielded by somethi laid upon it, probably a plate box, or something of that sort.

HOT-WATER APPARATUS.—R. W. WICKS writes: "Will you kindly infor me, in Answers to Correspondents, the most likely firm to apply to f apparatus suitable for giving a good supply of hot water for carbon pri ing?"—Maughan's Geyser is a good one; address, Queen Victori street. Ewarts, Euston-road, also supply a very good apparatus.

BLURRED PICTURES.—T. ATWOOD.—So far as we can judge, there is fault in the lens. The pictures are blurred to a degree, but that is d to the camera not being held still during the exposure. We are n saying that the lens is perfect, as we have no means of judging of tha because the camera was very perceptibly moved while the exposure w being made.

CRYSTOLEUM.—J. C. A. says: "I should feel greatly obliged if you would kind let me know what printing paper is used for crystoleum work, if any the printing-out paper would do, and which is the best way to mou them on the glass, also the best way to rub them down?"—Albumenise paper is generally used, or used to be used, for the method is rarely en ployed now, and, of course, that is a printing-out paper. Mount t print on the glass with starch paste. The paper backing may be rubbe away with fine glass paper.

PRINTER.—The formula is as follows:—

A.—Potassium bromide	.....	180 grains.
Water	.....	10 ounces.
B.—Cupric sulphate	.....	240 grains.
Water	.....	10 ounces.

Mix the two solutions and, after standing a few hours, decant or filte out any potassium sulphate that may be precipitated. The solutio may be used over and over again.

STUDIO BUILDING.—C. B. WESTOW. The design for the studio is excellent and we do not see how it can well be improved. The price quoted fo its construction seems to us exceptionally low; but perhaps labou and material is cheaper in your district than it is in the neighbourhoo of the metropolis. It is false economy, in the long run, to sacrific stability for the sake of a few pounds, and we are doubtful if a sub stantial structure could be erected for the sum stated, unless under th conditions intimated above. See article on the subject a few week back.

SIZE OF STUDIO.—T. WEBB asks: "Will you kindly answer the followin question? What would be the smallest size studio that would be of us to me professionally? Wanting to erect one 25 × 12, the Counc have rejected it as not being in accordance with the by-laws a regards space," &c.—We do not see that a studio any smaller than th size mentioned would be of much service for general professional wor of the best kind. The only advice we can give is, Make it as little les than that size as possible. Of course, you can build it the size name if you conform to the Act by building the studio of brickwork, wit glass lights.

GLASS POSITIVES.—W. L. DUNEDIN says: "I have three portraits (old gla positives) by the wet-plate process, which were taken about 1861 1862. Of late years a dark band has been growing gradually from t margins inwards, which bids fair to ruin them. Can you tell me ho to remove this blemish, or prevent it going farther?"—If the pictur are glass positives, the best thing to do will be to varnish them. H they been varnished, they would not have gone in that way. As a co lodion film which has been exposed to the air for so long a perio apt to undergo such a change that it becomes partially soluble i alcohol, a spirit varnish should not be employed. One in which benzo is the solvent will be preferable—dammar varnish, for instance.

CYANOTYPE, STUDIO.—JAMES BENTLEY says: "I want to ask you two questions The first is relative to a cyanotype process for post cards on page 76 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1895. Could yo tell me where I could get the chemicals mentioned, as I fail to do so i this district with exception of ferrieyanide of potass, or how to mak them? The second is, I am about erecting a small studio, chiefly fo pottery work of the kind enclosed (reglazed tiles). Its size will b fourteen feet long by six feet wide. I cannot get more. Could yo advise me as to the width of lights and height; whether you would hav a ridge roof or a lean-to, as I can only light from W.N.W., and wha distance from ends; and also whether it would be possible to tak photographs or life studies in it with a Wray half-plate rectilinear lens figures, of course, not full length, bust and three-quarters?"—1. The things can be obtained at any operative chemist's, such as Hopkin & Williams's, Cross-street, Hatton Garden. 2. The studio will be very small indeed for any purpose whatever. We should say, Have a "lean to," as you can only have one light. About three feet at either end may be opaque. Portraits, of course, *can* be taken in the studio, but they will have to be confined with that lens pretty much to heads and busts.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1931. Vol. XLIV.—MAY 7, 1897.

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EX CATHEDRÂ.

MR. WILMER'S letter, which we published last week, is a reminder that the preliminary arrangements of the suggested International Trade and Technical Exhibition for 1898, concerning which we have been constantly writing during the past year, have been advanced another stage. A Committee of the Royal Photographic Society has had the matter under consideration for several months, and the upshot of their deliberations is that it has been decided to convoke a meeting of manufacturers and the trade, which will be held at No. 12, Hanover-square, W., on Tuesday afternoon next, at half past three. The object of the meeting is primarily to invite an expression of opinion from the trade as to the desirability of holding the proposed Exhibition. It is obvious, therefore, that, the larger and more representative the meeting, the greater the force that will attach to any expression of opinion that it may take.

* * *

MR. WILMER points out that, if the opinion of the meeting is in favour of holding the Exhibition next spring at the Crystal Palace, it will be asked to appoint three delegates to represent their interests on the General Committee of the Exhibition. It is added that exhibitors will incur no risk whatever in connexion therewith, their liabilities being limited to the charges for floor and wall space, which will be at the rate of 1*s.* per square foot for the floor, and 6*d.* per square foot for the walls, and no effort will be spared to make the Exhibition a complete and representative collection, fully illustrative of the development and present position of photography in its widest sense, such as up to the present has never been held. Attention may also be directed to the request that those unable to attend are invited to express their views in writing, sending them in an envelope provided for the purpose, which envelopes will be placed, unopened, in the hands of the Chairman elected by the meeting.

* * *

IT is to be hoped that a fully representative meeting of manufacturers and the trade will respond to the Royal Photographic Society's invitation. All the arguments we can adduce in favour of holding the proposed Exhibition have long since been used, but we might reiterate the opinion that there is no branch of photography which will not be benefited and stimulated by the comprehensive and international character which it is desired to give to the proposed Exhibition. That Exhibition, as is well said by Mr. Wilmer, is designed to be a complete and representative collection, fully illustrative of the development and present position of photography in its widest sense. Photographic science, art, industry, and manufacture, in all their many divisions and subdivisions, are here referred to, and there is probably not a single individual whose interests lie in any one department of photography who will not also be interested in the success of what should be the greatest photographic Exhibition yet held.

* * *

IT is announced that, in consequence of the numerous applications received for an authorised photograph of the Queen for the purpose of reproduction, Her Majesty has been pleased to appprove of a likeness, with autograph signature, taken by Messrs. W. & D. Downey, Ebury-street, who have undertaken to give permission for its reproduction, without charge or fee, provided that their formal leave is obtained, and that Messrs. W. & D. Downey's name and address are printed under each impression.

* * *

IN connexion with the foregoing announcement, we have re-

ceived from Mr. F. Godfrey Cole, of 248, Caledonian-road, N., proofs of woodcuts and engraved half-tones of the photograph referred to. The portrait of the Queen appears an excellent and most dignified presentment of Her Majesty in state robes. Mr. Cole is prepared to supply blocks, and Messrs. Downey are also granting formal permission for their use.

* * *

The Meisenbach Company, of West Norwood, have produced a portrait of Her Majesty the Queen, which is intended to form a Jubilee supplement to newspapers. The block has been engraved very deeply to meet the requirements of rapid printing. The Company supply either electros or prints without the electro, and offer to submit a specimen print free of charge. Doubtless the conductors of many publications will take advantage of this offer.

* * *

In the last number of our contemporary, the *English Mechanic*, there is a reproduction of a photograph of a horse having apparently only three legs. The author of the photograph, Mr. G. E. Neeves, Cromer Lodge, South Croydon, says that the picture was taken in July, 1893, with an Optimus camera, rapid rectilinear lens, and a Paget XXX plate, with an exposure of about two seconds. There is no doubt that the animal, which had been hired for the drive, had four legs, yet the photograph, which has not been "faked" in any way, omits to reproduce one altogether, and only represents the horse as having three. "Can any one," asks Mr. Neeves, "explain satisfactorily the mystery of the disappearance of the other leg?" At the first blush one would be inclined to suggest that, during the exposure, the animal's extremity—it is the near hind leg that is missing—was very rapidly moved, and that, the lens being stopped down, the exposure was insufficient to register the "blur" thus produced.

* * *

According to a contemporary, a society was formed at the Congress of Art Critics, at Nuremberg, 1893. Its object was to give good photographic reproductions of masterpieces which are little known, being preserved in galleries which are seldom visited. In the private and often in the public galleries of England, France, and Germany there are many splendid works of art which have never been photographed, and are therefore not readily accessible to students, who are almost always largely dependent upon nearly complete collections of photographs. The first series of reproductions of the Society has appeared.

* * *

A writer in a monthly magazine—the *Cornhill*, to wit—has some reflections on being photographed. "What is the explanation," he asks "of the something ridiculous that attaches to the photographer's art? No one feels absurd in sitting to a painter. Is it the under-breeding of the presiding genius that gives one shame—his airs and graces, his injunctions to 'look pleasant,' or 'moisten the lips,' or 'let the light flash in the eye,' his twisting of one's elbow and spreading of one's fingers? I am inclined to think it is not altogether this, for even a Royal Academician must pose you; nor, again, is it the mere interposition of the mechanical camera, but rather the fact that everything depends upon the expression of a moment; and the attempt to choose a decent expression and maintain it on one's face, even for ten or twenty seconds, is disgusting. And then, too, the production of so many copies has the same banal effect as the hackneying of a phrase; so that a photograph is fitly styled a counterfeit presentment."

* * *

The correspondent who draws our attention to the foregoing poor attempt at smart writing remarks that he always understood that sitting to an artist was a most painful operation; in fact, he says, he has heard of ladies fainting in consequence of lengthy sittings in uncomfortable positions. Be that as it may, it is to be regretted that the writer of the above extract has so little acquaintance with the way in which a first-rate photographic studio is managed that he is betrayed into terming portrait photography "ridiculous," and into advancing the gratuitous assumption that the photographer is necessarily an under-bred person with "airs and graces," &c. Our pity for such ideas is only equalled by a feeling of regret that the honoured pages of the *Cornhill* should have been made the vehicle for these and the other absurdities contained in the extract.

CHEAP CHLORIDE OF GOLD.

It is not our purpose to dwell upon the so-called chloride of gold purchasable at 1*s.* or less a tube, the proportion of the precious metal present depending solely upon the elasticity of the conscience of the maker. Pure gold is worth close upon 4*l.* 5*s.* an ounce. The makers of genuine chloride, as has been pointed out in these columns before, guaranteeing seven grains of metal in a fifteen-grain tube of chloride of gold, have to face an original outlay of 1*l.* 19*s.* 8*d.* for the metallic gold in each ounce of the familiar yellow crystals, which is just under 1*s.* 3*d.* a tube, or 1*d.* a grain. Hence it will be seen that whatever sum a photographer pays beyond 1*d.* a grain is, theoretically, so much loss, provided he knows how to convert gold into chloride, the value of the small amount of acid necessary to dissolve it being virtually infinitesimal. As a matter of fact, according to how, and in what quantities, it is bought, the chloride stands its purchaser in from fifteen to fifty per cent. more than its metallic value.

But a profit shown on paper is not always realisable; let us see whether or no we can have cheap chloride of gold. If we buy fine gold from, say, a jeweller, we cannot get it for 4*l.* 5*s.* an ounce—far from it—for the refiner must be paid for his work, and thus we see a portion of profit lopped off at once; but, if we take a gold coin, say a sovereign, it contains exactly a pound's worth of gold, but, along with it, about nine per cent. of copper, &c. To get rid of this copper it is necessary, first, to dissolve the coin, then to precipitate the gold with ferrous sulphate or with oxalic acid, collect and wash the precipitate, and redissolve. Unless an experienced hand performs this work, there is great probability that an appreciably large proportion of the gold will be entirely lost during the washing operations; it is remarkable in what an extremely finely divided state the metal is precipitated, and the time required for it to settle is, consequently, unusually great. Here, again, there is chance of our paper profit going to the wall, so that, up to the present stage, we cannot be said to have explained how to get cheap chloride of gold, as what we have shown to be gained with one hand is lost with the other.

Is there any other alternative? There is. Whether it is a sufficient one remains to be discussed. We refer to the plan of simply dissolving a gold coin, and using the mixture so

btained, without taking the trouble to remove the impurity, hat is to say, mainly copper, which is found in all gold coins, hough less in the Australian than the English. The lver in the metal removes itself—it is precipitated. What is now required to be known is whether the presence of he chloride of copper with the chloride of gold has any in-urious effect. We made three batches of chloride of gold olution, No. 1 with pure gold, No. 2 with an Australian coin, No. 3 with a coin from the British mint. From each of these 'e made, under otherwise identical conditions, batches of oning solutions with acetate of soda and with sulphocyanide f ammonium. Choosing sets of prints as near alike as ossible, we used each bath in turn for the sets, and found it mpossible, after the toning, fixing, and drying, to discover the lightest difference in action between the gold toning and the opper-gold toning solutions. To make assurance doubly sure, 'e gave a quantity of the copper-gold chloride solution to a entleman through whose hands a great deal of printing passes, nd asked him for a report. He did not perceive anything ifferent in it from any other chloride of gold he had used, nd, as a matter of fact, we find that he never uses the gold hloride of the shops, he always makes his own direct from oins. He reckons that, not counting time or establishment orking expenses, he at least saves something between 3*s.* and 4*s.* or every sovereign used. In these days of competition this mount is well worth considering, for, as we showed in a recent rticle, that touching Professional Photographers' Profits, things are not what they seem."

We may conclude with a little advice as to the mode of naking. When the gold is all dissolved, it is desirable to rive off by heat the major portion of the free acid, as, if this e not done, and the acid be neutralised with chalk, the mount of chloride of calcium so introduced may have an effect pon the action of the toning solution. In driving off the cid it is just possible that too much heat may be used, and ome of the gold precipitated; but, should this occur, all that s necessary is to dilute the solution, filter, and then weigh the recipitate. The amount of gold in solution must, of course, be eckoned as less than the recognised amount by just so much s there is found to have been thrown down. The precipitate s not always gold, but by heating it to redness all chlorine or xygen is driven off, and pure metal remains behind, and can hen be weighed when cool. The means here shown suggest erhaps the only useful method for the every-day photographer's ands that will enable him to use home-made but cheap chloride f gold.

Gas Cylinders.—The recent destructive explosion at the ldersgate-street Station excited the suspicion of some writers that t might be due to a cylinder of compressed gas carried surreptiously by a passenger, and reference has more than once been made o the fatal explosion of one at another station; but at present here are no grounds whatever for the suggestion, and there appears o be no reason why any reference should be made to gas cylinders t all, unless it be to raise another scare about them. One of the ailies, by the way, describes a gas cylinder as "one of those tubes which are used to convey oxyhydrogen gas."

The Picture Season.—The Royal Academy was opened to he public on Monday, and, of course, the rooms have since been rowded daily, as usual. The picture season is now fairly with us—s witness the number of exhibitions at present open. Pictures, alore, are to be seen week days and Sundays in the National and loan collections, and it will be interesting to note if the lordly Royal Academy will ever open its doors to the public on the Sunday. Possibly it may do so, as we are aware that many of the Academicians, and knights of the brush generally, are by no means strict Sabbatarians. It is surprising how comparatively few photographers visit the Royal Academy, for they might often profit by it if they did. Photographers may learn much from paintings—in the same way that painters have learnt much from photographs. Many pictures are now painted almost entirely from photographs, though, of course, the artist does not say so. Paintings and photographs are different. If a painting is made from a photograph, there is no means of knowing it; but, if a photograph is made from a painting, the thing is palpable to every one.

Trade Marks.—A case of some importance to those about to register a word as a trade mark was decided in the Court of Appeal on Thursday, last week. Five years ago, it appears, the Eastman Photographic Materials Company, Limited, decided to register the word "Solio" as a trade mark for their photographic paper, but the Comptroller refused, on the ground that the word had reference to the character or quality of the goods, and that is against the Act. Since then another house has been allowed to register "Solanite" as a trade mark for a photographic printing paper, and, in consequence, the Eastman Company, in 1895, again applied to register the word "Solio" as a trade mark, and were again refused. An application was then made to the Board of Trade, who referred the matter to the Court, where Mr. Justice Kekewich upheld the decision of the Registrar. From this the Company appealed, but the appeal was dismissed with costs. The Lords Justices Lindley, Lopes, and Rigby held that, while "Solio" was an invented word, it was used in connexion with photographic paper, hence it would suggest something sensitive to the light of the sun, and therefore could not be said to have no reference to character or quality. It is a little difficult for the lay mind to understand why "Solio" has reference to character or quality while "Solanite" has not, when both are applied to photographic papers.

The Royal Arms.—We have more than once referred to prosecutions for using the Royal Arms without the proper warrant to do so, as many photographers did, and some do still. Although most of our readers are now aware that it is illegal to put up, or to have on letter headings, &c., the Royal Arms, and "by Appointment to the Queen," simply because Her Majesty has patronised the user, all are not so fully aware that it is equally as illegal to do so with reference to any of the Royal Family. There exists, as our readers know, the Incorporated Association of Her Majesty's Warrant-holders, Limited, who have generally taken up the prosecution of offenders; but hitherto this Association has been limited to those who possess the Queen's warrant. On Saturday last, in the Chancery Court, Mr. Justice North heard a petition to alter the memorandum of this Association, so as to include tradesmen holding warrants from the Prince of Wales and other members of the Royal Family, the Association to be known in future as "The Incorporated Association of Her Majesty's and other Royal Warrant-holders, Limited.' Both the Queen and the Board of Trade, it was mentioned, had consented to the alteration. The learned Judge granted the petition subject to some little formalities being complied with. Hitherto, we think, no action has been taken against any one for illegally using the terms, with the Arms, "by appointment" to (say) the Prince of Wales, or any other members of the Royal Family. This may, possibly, be due to the fact that there was no organ zed body to take action against the offenders. The case is different now, hence our reason for calling attention to the matter.

The Diamond Jubilee.—It is very evident that the Jubilee has brought grist to the mill of those who possess negatives of the Queen, particularly those of recent taking. Portraits of Her Majesty of earlier periods are also in demand, and, thanks to her love of photography, there are plenty of them to be had. Some of the photo-mechanical workers have also benefited greatly, as witness the

number of photogravures, process, and other works to be seen in the shop window at the present time, though, we regret to say, they are not all made within the Queen's dominions. The export of portraits by all processes of the Queen to the colonies, we are given to understand, has been enormous during the past few months, and still continues. So much the better for trade.

Apropos of the Jubilee and the large amounts, it is rumoured, that have been offered for advantageous sites by cinematographers and photographers, it will be interesting to see what results will be obtained. Photographs of processions are always disappointing, as they have, as a rule, to be taken from elevated positions, and the view is generally much obstructed by the lavish display of bunting. Further, there is usually a haze of dust and mist in the streets above the heads of the crowd, which materially interferes with getting much in the distance. The procession will pass the premises of many photographers, and it will be interesting to see how many have reserved the best window for photographing the pageant, or have let it in seats, and which, in the end, will prove the most profitable. We opine the latter, but, since the great "slump" in the price of seats, the case may be different. Any how, we do know that some photographers have let the whole of their windows, and reserved none for themselves.

DIGRESSIONS.

No. XVII.—Conventions.

"The spring makes us hope for summer, the summer for the middle of July, and then the Convention makes our bliss complete. All other delights pale before this, and then the desire to hybernate until another July comes upon us." So raved an enthusiastic friend the other day, and I was tempted to agree with him; for surely the one holiday of the English—I mean the British—photographers (for Ireland and Scotland supply some of our most popular Conventioners) is worth looking forward to with interest.

I have made the present subject a matter of considerable research, and, as far as I can ascertain, photographic Conventions, like cricket, football, art loan collections, and some other things, are only possible to English-speaking races; any way, I have never heard of anything of the kind on the Continent, or even in the Channel Islands.

Let me clear my soul, to begin with, concerning the one held at Leeds last year. It is, I believe, generally known, or was for a week or two, that I occupied the honourable position of President, and, in fact, do so now for a little longer. Nobody can know with what real reluctance I accepted office, feeling quite sure it would be a dreadful trouble to me and infinite worry. Having avoided everything of the kind all my life, and had no experience, I felt certain that there was nothing before me but ignominious failure, that I was a ridiculous old round peg trying to fit myself into a square hole; but I had overlooked the skill, indefatigable attention, and ingenuity of others. As time went on, I felt that everything I ought to do was done splendidly—*by somebody else*, and I began to think myself peculiarly suited to the position, and confidently felt I could rule a kingdom if I could have Mr. Drage as Prime Minister, and Mr. Bingley, Mr. Bothamley, Mr. Pringle, and a few others in high office. I never felt before how well everybody was making *me* behave; and I must have behaved a good deal, for I slept for nearly a week when I got home.

Was this to be wondered at when we consider the pace of our pleasures? The last day at Leeds, for instance, began at 7.50 a.m., and consisted of a round of excursions to distant regions, returning too late for dinner; papers at the Philosophical Hall at 8.30 p.m.; a lantern show; a Council meeting; a large smoking concert at another place; and a visit to the municipal fire brigade in the small hours. And this day of "violent delights" concluded by the President and a dozen Conventioners getting lost in the streets in their endeavour to return to headquarters.

Our Convention is not entirely original with us, or probably we should have called it by another name. "Congress" would have been more in accord with English usage. The American photographers were before us, or rather it would perhaps be truer to say the American dealers in photographic materials, and I believe their early Conventions were entirely devoted to business and advertisement. On our side we have made business a very subsidiary affair. We have a very useful, but not obtrusive, show of the materials we use, for we want to see what is new, and what survives because it is good; we have an Exhibition, sometimes specialised, as last year, when we got as near to unadulterated pictorial effect as—I won't say the art, but as circumstances would allow. On other occasions they are more general.

This year the Exhibition will probably, pictorially, be local. Perhaps the secret of our success is that no good Conventioner takes anything too seriously. We give ourselves up to healthy pleasure, social intercourse, a little exhibition, less science, no work, endure being photographed, no trouble, except after pleasure. We survive mayoral receptions, *conversaziones*, paper-reading, smoking concerts, banquets, excursions, A. M. S. gatherings, and lantern shows; and we even find ourselves all the better for it both mentally and bodily. Now, in our cousins' Conventions, if we may judge by the reports, everything is a good deal more formal, called to order, precise, done with a purpose, and, I almost fear to say it, done for the purpose of the advertisement or notoriety it will bring to the individual. This cannot be so enjoyable as when pure holiday is the rule.

We differ also in another way from our friends across the water. We have only one Convention in the year, they have many. They have not only the one great Convention, but many others in connexion with the various States.

What appears exceedingly curious to us is that, except in a recent instance where he was admitted under restrictions, very little consideration seems to be given to the amateur; indeed, ignoring the amateur appears to be accepted as the only way, the dealer is the most prominent person, and a competitive exhibition and a display of goods the chief features. Vast quantities of prizes are given, some even for impossible subjects, such as scenes from *Hiawatha* and *Idylls of the King*, and the reading of papers is an important part of the proceedings—a once important function with us of which we are now perhaps a little tired, but do not much object to when a man has something to say, but we greatly object to the reading of a paper for the sake of "filling up an hour," for we have none to spare. I must confess that some of us are still terribly fond of a formal meeting, no matter what the subject may be.

Will it be believed that our goahead cousins are only now making tentative experiments, through a State Convention, to see if it would be judicious to admit the amateur into their body. We do not look on him over here as so fearsome a wild fowl.

On our side, we cannot get on without the amateur; a Convention of professionals only would be meat without salt. We never see any harm in the sort we get, and a good deal of good. We are on pleasure bent, and he is always good at that. He joins in our excursions, he helps in everything, and greatly adds to the life and soul of the whole concern; and, what it would perhaps be difficult just yet to make the American photographer believe, he can often give a hint that will promote picture-making, and even business. We are, in fact, half amateur; this alone adds much pleasant variety to the gathering. Not, however, that we violently recognise any separate classes; it is quite enough to be "a photographer," no other distinction is necessary.

There seems to be another difference between us which I do not know how to interpret. To me it seems as though the ladies have been found difficult to entertain, or in the way. But I will give the suggested difficulty as I find it in *Anthony's Bulletin*, for fear of making a mistake: "It is intended this shall be the red-letter Convention of the Association. There will be a Ladies' Entertainment Committee, to take charge of the visiting ladies while the meetings are in session, which will leave their escorts no responsibility in that direction, and make it more agreeable to the visitors than if left to their own devices for means of entertainment."

I don't know whether it is the fault of the reporter, but the chief feature of all the American Conventions seems, to the onlooker from a distance, to be that nothing is done for the pleasure of the thing,

r the honour and glory of the art. Prizes, medals, certificates, seem o be absolutely necessary to attract a company. A little extract rom the *Photo Beacon*, on the doings at Detroit in February, will how how much the medal-awarding is a matter of business, and ikely to cause heart-burnings and want of harmony.

"Another anomaly happened at the Detroit Convention. Two photographers from the same town entered their work in different lasses. One gained somewhere about sixteen points out of a ossible thirty, and, being sole competitor in the class, was awarded a old medal. His rival in business was rated fully three points igher, but gained only fourth place in his class. So the poorer workman takes home a gold medal to boom business with, while he better man will, in public estimation, be rated as being the nferior. Is it not about time to stop this medal business altogether? t is nearly as bad as estimating a man's success in life by the amount f money he has accumulated."

It is very satisfactory to see the writer—one of the most indeendent of the American press—come to so sound a conclusion, but e fears he cannot suggest a means of avoiding this anomaly as long s medals are given. I don't think such a thing could happen with s. We don't class photographs with horses, dogs, or cats, and herefore don't judge them by points; then, the sixteen-point man, eing sole competitor, what did his exhibit compete with? With s he would not get a medal without competing, and it takes at least two to make a competition.

At British Conventions it would be strange to see a photographer without his camera, and it is singular that the American photographer loes not seem to care to take one with him. Last year he went o Chautauqua, a beautiful locality, within reach of Niagara Falls, nd this is what *Antony's Bulletin* says in mentioning the arrangements for this year which will be held in the same place: "A source f regret among many last year was that they had not provided hemselves with hand cameras, by which they might have taken home with them many reminders," &c.

In fact, the difference between the two kinds of Convention is enormous. The one has "Push business" written all over it; the ther says, "Let us get away from business for at least a week." And, after all, who shall say that at our Conventions a great deal of useful business is not very pleasantly done?

I don't think I intended to criticise the American Convention so freely when I began to write, but these Digressions afford sad opportunities for being led astray. I hope our friends will forgive me, for I owe them much in many ways, and it is quite possible their institution suits them much better than anything we could suggest. I send them brotherly greeting.

Conventions, whether for business or pleasure, are good any way, and for their own sakes, as well as my own, I should like to see many fresh faces, as well as the old ones, next July. The next probably will be the most *picturesque* Convention of the series, for Great Yarmouth will be the location, and Mr. Cembrano the President. All who know both know that such a combination promises much; besides, Mr. Drage is still our Hon. Secretary, and I think, from what I have seen, I may take the liberty of assuring the members that they are in for their usual excellent good fortune in the local Honorary Secretary, Mr. H. Harvey George, whose business energy, enthusiasm, and devotion to the comforts and delights of the Conventioners seem unbounded. A programme has been arranged, beginning in the usual way, and ending with a regatta on the Broads, including every variety of subject, from solid architecture to sea voyages, and it was ordered, at the last meeting of the Committee, that the moon should be at full as much of the time as kindly nature would allow. It promises to be an event that will be a lasting regret to every photographer who does not attend.

H. P. Robinson.

THREE-COLOUR PHOTOGRAPHY.

I.

An important work on this subject has just appeared under the title of *Die Dreifarbenphotographie** from the pen of Freiherr von Hübl, the author of works on collodion emulsion and platinotype.

After a brief sketch of the various methods which have been used for the reproduction of colours by photography, an explanation of the vibratory theory and light is given, and in this he divides the spectrum up as follows:—Red reaches from the extreme limit of the spectrum to the Frauenhofer line, C. From C to D the red changes gradually into orange, and very close to D lies the pure yellow, which forms a very narrow strip and shades off into yellowish-green, and between E and *b* lies a yellowish-green, and close to *b* begins the pure green, and close in front of F lies a narrow zone of blue green, the pure blue which Helmholtz called cyan blue, lying at F. This blue corresponds to that of deep masses of water or glacier ice. Behind F the blue loses its greenish shade, and shades off into a reddish-blue, and finally passes at G into violet. From G to the end of the spectrum the colour is a bluish-violet, and may be likened to the colour of methyl violet. For three-colour work it may be assumed that A, B, and C fall together, as do also G and H.

The purity of a colour is defined as the absence of white and black, and all transitions from the pure colours to their mixtures with black, grey, or white, are called shades. From the physical standpoint there are three factors in colours: (1) The colour tone, which is dependent on the various wave-lengths of light; (2) the brightness or intensity, which is dependent on the amplitude of the ether waves; and (3) the saturation, which is dependent on the singleness of the light—that is to say, if waves of only one length are present, we have the impression of the most complete saturation; if there are other waves present, then we have the sensation of white, and the saturation is more or less incomplete.

Complementary colours are two spectral colours which form white, and the following are complementary: Red light of wave-length 656 is complementary to blue-green of wave-length 492; orange of wave-length 608 is complementary to blue of 490; yellow of wave-length 578 is complementary to blue 477; greenish-yellow of wave-length 571 is complementary to violet of 455.

If two spectral colours, which lie nearer to one another than the complementaries, an intermediate spectrum colour and some white are formed. If light is allowed to pass through coloured glasses or dye solutions, which have approximately pure spectrum absorptions, then the mixed lights behave like spectrum lights, and thus orange and green make yellow, and, if to this blue be added, we have white, and upon this fact is founded three-colour projection and the instruments called photochromoscopes, &c.

The formation of colour by pigments is explained by selective absorption and reflection, *i.e.*, white light penetrates the surface of the pigment, and some of its constituent rays are observed, and the rest are reflected from the underlying particles, and, reaching our retinal nerves, give us the sensation of colour.

A very valuable method for finding the absorption of any dye is given, which was suggested, in the first place, by Helmholtz, and it consists in replacing the ordinary ocular of the spectroscope by a narrow slit, and comparing the colour of the solution with the spectrum. When this is found, the complementary colour will be the mean absorbed colour of the dye. Thus the colour cyanide solution was found to correspond to the spectrum between F and G, and to this the yellow just beyond D is complementary, and this is the colour absorbed by cyanine.

The various methods of determining the colours formed by the admixture of pigments by rotating sectors, according to Clerk Maxwell's plan, is fully described, and the explanation of the formation of the colour in the three-colour printing, not by the superposition, but by laying down with very small interstices dots or lines of the different colours.

The practical position of the three-colour printing is treated at great length, the first subject touched upon being the choice of the colours, and Hübl shows, by means of a chromatic circle and the formation of equilateral triangles, which colours can be used, and one triad is cadmium yellow, nachtrosa, and a mixture of one part of peacock blue and two parts of viridian green lake; but these colours need not be closely adhered to, as rose Bengal lead may be used instead of the nachtrosa, or Paris blue and madder lake may be used.

For projection, by means of the staining and superposition of three films, naphthol yellow, erythrosine, and echtgrün.*

The author gives numerous curves to show how the plates should be sensitised for making the three negatives, but these would require to be reproduced to make any comment intelligible, whilst Hübl points out that only by numerous spectro-photographic experiments can suitable sensitisers be found; but, as he points out that it is not easy to compare the intensity of the bands, so he recommends the use of control colours.

* *Die Dreifarbenphotographie*, von A. Freiherrn von Hübl. Published by Wilhelm Knapp, Halle a/S. Price 8s.

* The translation of this term would be fast green, which, according to Benedikt (*Chemistry of the Coal-tar Colours*, p. 144), is malachite green; but it is doubtful whether this is the dye meant, as there is probably no greater confusion of names in any other branch of commerce than in the aniline dye industry.—A. D. P.

i.e., patches of the chosen pigmentary colours on paper, and that, if these be photographed, two must photograph like white, *i.e.*, be opaque, whilst the third must be transparent; and he adds that this result can only, however, be hoped for when the colours are of absolutely equal purity, which, as a rule, especially with the blue dyes, is not the case. He suggests photographing squares of colour which are complementary to these colours, and at the end of the work is an illustration of the same.

The relation between the printing ink and the light filter or coloured screen is, fundamentally, that the filter should be spectroscopically complementary to the printing ink, which agrees with Vogel's principle, that the printing and sensitising colour should be spectroscopically alike; but, as the former can hardly be carried out in practice, the latter is the basis that should be chosen for work.

The author, in speaking of the sensitising of the plates, points out that photographic plates are sensitive to the invisible ultra-violet rays beyond H, and that Dr. Eder's experiments have shown that these rays play only a very subordinate part in the formation of the photographic image, and their influence has been much over-estimated. Daylight contains only few ultra-violet rays, and that they are for the most part absorbed in passing through the glass of the lens and the filter, and that the sensitiveness of the silver bromide does not extend far into the ultra-violet. These rays exert thus, with normal times of exposure, practically no influence on the photographic action of pigments.

Hubl's work on the screening action of the dye is well known, and he naturally lays stress upon the differentiation of this and the sensitising action. He further points out that the sensitising action of the dye depends greatly upon the nature of the plate and the process of sensitising; thus a collodion emulsion plate is principally sensitised for wave-length 557, *i.e.*, D ½ E., whilst a gelatine plate, after bathing in a very dilute dye solution, shows a maximum at λ 560, whilst, with a deep-coloured bath, it will be sensitised up to λ 535, or almost up to the D line.

The following notes upon the sensitising of plates will be of practical value:—

1. *Sensitising for Blue-green.*—A sensitiser for blue-green, between B and F, is unknown, but acridine, first examined by Eder,* is the best, and acridine, NO, which can be obtained from Leonhard, of Mühlhausen, is the best, and can be applied equally well to gelatine and collodion plates.

2. *Sensitising for Green.*—Uranine, the sodium salt of fluorescein, is the best sensitiser for green, and it should be used in the form of a silver salt, and it acts better with collodion than with gelatine.

3. *Sensitising for Yellowish-green and Yellow.*—All the eosines may be used for this, or rhodamine, or, better still, chinoline red.

4. *Sensitising for Orange and Red.*—Bluish rhodamine, which is tetraethylrhodaminethyester, is the best sensitiser for yellowish-orange, and cyanine may be used for orange, and nigrosine, alizarine-blue bisulphite, or chlorophyl may be used for spectral red.

Naturally, the composition of the filters takes up considerable room, and the author points out that they may be placed before or behind the lens, or just in front of the plate, and they may be either a sheet of coloured glass, or glass coated with a coloured film of collodion or gelatine, or a cell filled with liquid. With increasing saturation of the filter, rays which a weak filter would pass are absolutely absorbed, and it is not sufficient to designate a dye solution as the filter, but its concentration and thickness must be given. The more sensitive a plate is to the rays which are absorbed by the filter, the more rapid the objective and the brighter the illumination of the original, the denser must be the absorption band of the filter in order to attain the desired end. The absorption of a dye differs in the dry state to that of a solution.

Picric acid does not absorb the whole of the ultra-violet, but fades off gradually towards M. It can be used either in solution or in a collodion film, and, to prevent the crystallising out of the acid when the film is dry, a few drops of aniline should be added to the collodion. Naphthol yellow, or Martin's yellow, should, for intense screens, be dissolved in negative varnish, whilst if aqueous solutions, or to colour gelatine films, naphthol yellow, S, should be used.

For orange filter aurantia can be used, but this, according to Buss allows the ultra-violet to pass; but, except in long exposures, this can be neglected. Chrysoidine allows visible violet to pass, but very much dampened. Acridine allows the whole of the visible violet from G to H to pass.

Red filters are best prepared with eosine, or rhodamine and a solution of Biebrich scarlet, or collodion dyed with saffranine, may be used. Potassium chloroplatinite also forms a good filter.

* *Photographische Correspondenz*, 1894, p. 320.

Pyoktamin coerl, a kind of methyl violet, is the best for the violet screen, or for a collodion film Victoria blue.

Acid green and picric acid should be used for the green liquid filter, or for a collodion film brilliant green should be used. Cupric chloride may also be used.

A. D. Paetzl.

PHOTOGRAPHIC EXPORTS.

Compiled from the Customs Entries.

April, 1897.

	£		£
Adelaide	156	Brought forward	5550
Amsterdam	34	Madras	111
Antwerp	649	Mauritius	43
Auckland	77	Malta	80
Bangkok	114	Melbourne	575
Beyrout	10	Monte Video	11
Bombay	672	Montreal	9
Boulogne	133	Napier	61
Buenos Ayres	214	Newcastle	12
Brisbane	308	Odessa	77
Brussels	506	Oporto	72
Calcutta	331	Ostend	90
Canterbury	111	Otago	155
Capetown	403	Perth	135
Christchurch	91	Piræus	25
Christiania	58	Port Elizabeth	303
Colombo	53	Rangoon	55
Constantinople	11	St. John's, N.F.	21
Durban	446	Shanghai	173
East London	63	Seville	5
Flushing	264	Singapore	35
Foochow	29	Stockholm	82
Fremantle	20	Sydney	1129
Ghent	301	Teneriffe	25
Gibraltar	40	Tokio	120
Gothenburg	12	Trinidad	24
Hamburg	246	Tunis	6
Hong Kong	12	Wellington	126
Jamaica	14	Yokohama	405
Kurrachee	134		
Las Palmas	18	Total	9515
Lisbon	20		
Carried forward	5550		

April, 1896.

	£		£		£
Adelaide	102	Brought forward	2728	Brought forward	4527
Alexandria	28	Flushing	349	Otago	105
Algoa Bay	125	Genoa	25	Perth	90
Amsterdam	70	Ghent	46	Port Elizabeth	7
Auckland	279	Gisborne	17	Reval	4
Bangkok	55	Gothenburg	27	Santander	17
Barcelona	35	Hamburg	282	Shanghai	22
Bombay	630	Hiogo	43	Singapore	35
Boulogne	224	Hobart	22	Sydney	348
Buenos Ayres	70	Hong Kong	140	Wellington	61
Calcutta	651	Invercargill	30	Yokohama	48
Cape Town	190	Kobé	69		
China	14	Kurrachee	37	Total	5264
Christchurch	90	Launceston	22		
Colombo	53	Lyttleton	49		
Demarara	17	Madras	102		
Durban	52	Malta	30		
East London	43	Melbourne	509		
Carried forward	2728	Carried forward	4527		

THE PHYSICAL INTENSIFICATION OF EMULSION PLATES.

Attention has been called by several correspondents to the formula reprinted at page 264 (April 23) from the *Photographisches Wochenblatt*, for the physical intensification of gelatine negatives, which is said to fail in giving any increase of density. Curiously enough, this formula is said to be a correction of one "in a contemporary," where the "quantities had been incorrectly given;" but surely there must be something wrong with the proportion of silver in the correction. We have tested the formula, using the quantity of silver indicated, and find that, so far from the action being complete in from five to ten minutes, practically no effect was produced in five hours, though, when more silver was added, intensification proceeded readily enough. In fact, when the intensifying solution was diluted down for use, with the addition of three grains of

pyro and three minims of strong ammonia added to each ounce, it remained perfectly clear, and had only moderately discoloured after twenty-four hours, not a symptom of any precipitated silver being apparent, so that it is difficult to imagine how any intensifying action could take place, since in any physical intensifier the result is produced by metallic silver thrown down from the solution itself.

This process, attributed by our contemporary to Hans Schmidt, was in reality, we believe, first made public by Mr. J. B. B. Wellington in our ALMANAC for 1889, and further improved or modified in the following volume for 1890. But Mr. Wellington's proportion of silver, as compared with the sulphocyanide of ammonium, in his original formula was just ten times as great as that given in the formula complained of, while in the modified formula it works out to a little more, and Mr. Wellington remarks that success depends upon the solutions being fairly concentrated, as weak solutions are of no use except for collodion. Unless, therefore, there is some mistake in copying out the recent formula, it is evidently based upon wrong lines, though the process as originally given is an admirable one.

The reason why the method has not come into more general use is probably to be traced to the fact that it is, as Mr. Wellington pointed out, not a cheap intensifier, each ounce of solution, as used, containing nearly twenty grains of silver nitrate and twice as much sulphocyanide of ammonium, besides pyro and ammonia; but, with this exception, it is without a fault, and for collodion negatives, where a much smaller quantity suffices, even this objection disappears. For this latter purpose we have used it a good deal, and also for strengthening transparencies and lantern slides, and have not found it in any way expensive. Even with gelatine plates intensified in a dish, it does not prove so expensive as might be expected, as the same solution may be used for several negatives by simply strengthening it from time to time with concentrated silver and sulphocyanide solution and ammonia as occasion may require.

A most convenient way to use it, or rather to keep the solutions, is in the concentrated form, and for the silver solution we want no better formula than that given originally by Mr. Wellington, only adding a little hypo as well as the cyanide. This will make the formula as follows:—

Sulphocyanide of ammonium	240 grains.
Nitrate of silver	100 ,,
Hypo	30 ,,
Water	2 ounces.

When required for use, we take for a half-plate negative ten to twenty minims of this concentrated solution, and make it up to two drachms with the ingredients of the ordinary developer, pyro, bromide and ammonia, using all perhaps in rather stronger quantity than for ordinary development, as the only effect of increasing the strength is to expedite the action, and not, as in the case of development, to cause fog. Of course, this quantity will only answer for a collodion negative intensified in the hand; but the same proportions answer for gelatine, and, if several negatives are to be intensified at one time, probably a couple of ounces will answer for all with a little timely strengthening from the stock solutions.

The rationale of the process appears to depend upon the silver solution being in such a state of concentration or saturation that the addition of the reducing agent upsets the equilibrium, and causes the precipitation of the silver on the metallic form; for, if the solution of intensifying strength be allowed to stand for a short time in the developing glass, it will become muddy, and deposit a sediment of grey metallic silver precisely resembling that given with the wet-plate developer. In fact, the action of the solution and the appearance of the image it gives exactly resembles the wet-plate iron developer; but, if the silver solution be not sufficiently near to saturation, the solvent power of the sulphocyanide and hypo suffice to counteract the reducing action of the pyro and prevent the deposition of the silver; in fact, as we have already mentioned, with the small quantity of silver given in the formula quoted a fortnight ago, precipitation does not take place in twenty-four hours.

There is another point to which attention is called in the article quoted from the *Wochenblatt*, namely, that the addition of soluble bromide hastens instead of retarding the action as in development. This we believe to be due to the conversion of the sulphocyanide of silver into bromide, which, being less soluble than the former, is more readily reduced, or, at least, the solution is brought to a point nearer to saturation, and therefore nearer to the precipitation point when the silver it contains is in the form of bromide rather than sulphocyanide. Probably the use of a soluble iodide would have a still stronger action in the same direction.

There is one precaution that should be taken in using this process to which sufficient attention has scarcely, we think, been called, and that is, that the negatives should invariably be refixed after intensification. Mr. Wellington, in his ALMANAC article for 1890, certainly mentions that they are to be fixed, but does not lay any emphasis on the direction, but it is in the very highest degree necessary. We have on more than one occasion recently pointed out that silver bromide is proportionately more soluble in strong sulphocyanide than in weaker, and that, when a strong solution is diluted, a portion of the bromide is thrown down, and the same with the chloride, so that films fixed in sulphocyanide retain some of the silver haloid in consequence of this reprecipitation when the negative or print is washed. The same thing occurs in intensifying, and, though it may not be immediately palpable in the case of a gelatine negative with slightly veiled shadows, it is unmistakably so in the case of collodion, and more especially if the subject be a lantern slide. Here, immediately the intensifier is washed off, the clear glass portions of the image will be seen to be covered with a dense layer of silver bromide or sulphocyanide, not so dense, of course, as before fixation, but sufficiently so to be much more than merely visible, or to be describable as opalescence. In the case of gelatine films, though the result may not be so easily noticeable, it is none the less present, indeed the probability is that the quantity of precipitated bromide will be much greater than with collodion. Hence the absolute necessity for refixing.

With regard to the first fixing, it is probably unnecessary, and perhaps, by dispensing with it, intensification is hastened. Such at least we deem to be the case with collodion, for, if the intensifier be applied to the unfixed plates, its first and almost instantaneous effect is to fix it, and the added silver thus introduced seems to expedite the intensifying action. We have not tried this plan with gelatine; but, though the fixing action would be slower, there is no reason to doubt that the same hastening effect would accrue. It is possible, though, if an abnormally strong reducing solution were applied to the unfixed gelatine plate, that green fog might result, and probably would, as all the elements for its formation would be present. This, however, is only a matter of conjecture, but, if the operation of fixing can be usefully and safely dispensed with, so much the better.

PHOTOGRAPHY AS AN AID TO THE ARCHITECT.

[Transactions of the Edinburgh Photographic Society.]

To my friend, Mr. Lamond Howie, I am indebted for rekindling, many years ago, an early but nearly extinguished love for photography. My then cumbrous camera had begun to make me realise how much of a feeling of slavery we could disguise under the spell of enthusiasm for a hobby. At a meeting of our Society, when various models of cameras were exhibited, I was started anew on seeing how compactly modern ingenuity had contrived to group a perfect touring outfit; and so, like the blown-out candle whose vertically ascending smoke becomes relit by the touch of a distant flame, I was by the touch of that Exhibition started afresh with a new outfit, which, during the ten years I have used it, has afforded me more enjoyment and interest than any pastime I ever engaged in.

My first and most recent stand cameras are here, and will be explained, but meanwhile I shall proceed to my subject.

Coming after our friend, Mr. Penman, who so generously at the last meeting gave us what might be called a view of his official diary, revealing to us the purposes in which he found, in the exercise of his profession, a camera could profitably be employed, I almost feel like the last speaker on an extended after-dinner toast list, who reflects that the man who has just sat down is likely to be more thought of than he who gets up, because most of what the speaker could say has already been said. Yet, on a closer examination of the previous paper, I am glad to find there are a few points not directly touched upon. In that we have most interesting records of business labours faithfully represented, and most practical in their application. Up to that stage the camera stands equally related to the civil engineer and the architect, but it does not seem to me to carry the former beyond that point, from which, however, it becomes a closer and more helpful companion to the architect. Freed from the mechanical bonds of being a mere recorder, the eye of the camera becomes to the architect the charming delineator of picturesque groupings, with all their poetry of light and shadow. It measures to the architect the exquisiteness of grace in form and of beauty in proportion, and, when brought face to face with architectural art's noblest conceptions, as at York or Salisbury, it reflects indelibly the silent teachings of their geometric harmonies of composition, and conveys to the mind something akin to the sweet musical cadences of maidenly graces. To the student who would woo his charmer still nearer, the camera harmlessly plucks such choice flowers of detail as have charmed his eye, to be relit in his studio, and to become to him a never-failing source of fresh inspiration. We say harmlessly, because, while enriching him, it renders his subject no poorer. Such flowers are everything to the archæologist, who learns from them more of the people of bygone centuries than written books can

tell. Surely, if it were no more than this, the camera, more than a mere commercial friend, proves itself to the art-seeker a loving companion and instructor.

To art in every department the camera has proved itself an invaluable aid. It is likewise an exponent of art. But, confining ourselves to the art of architecture, we have only to take a retrospect of about fifty years, and glance at the enormous and rapid developments in architectural design, as illustrated in modern examples, to read that somewhere a special influence has been at work. Undoubtedly that influence, to a large extent, has been the camera. The great accompanying factor to the camera is the steam engine. By its means distant lands—the birthplaces of art—have been visited and explored, and, instead of imperfect impressions of monuments visited being carried home, the camera quietly and without inconvenience imprints every object, every detail, with incomparable fidelity. Later on, under comfortable home conditions, those imprints can be leisurely and contemplatively studied. It is thus that the architecture of Britain has, during the past fifty years, undergone such rapid changes. A free people, with strong vital energy and ever pressing forward, we rapidly assimilate all that crosses our path. The architect shares liberally the facilities for travel, and he has now freely brought under his notice accurate representations of the most distant architectural monuments, with the result that, from a condition of classic rigidity, the art of architecture has loosened the bonds and started afresh in a new life, placing nearly every country in Europe under tribute for its sustenance. Perhaps the most prominent revival has been in the section of ecclesiastical architecture. The long untrodden districts of France—the home of Gothic architecture—have been explored, and their wealth of cathedrals and village churches revealed. Those have been collected by the sketch-book and camera. The result is an unmistakable advance in the spirit of church design everywhere in Britain. In whatever style expressed, whether in the robust dignity of Norman, the graceful, maidenly simplicity and purity of Early Gothic, or in the florid exuberance of Later Gothic, we find the main principles underlying those styles better known, and their relative details better interpreted, than can be traced in like works of the early part of the present century.

With the restlessness characteristic of the people, the practice of Gothic architecture, which for a while was applied alike for municipal as for ecclesiastical edifices (inappropriately, I consider), fell aside before the quaint Renaissance of the Low Countries. Their contributions of whimsically shaped gables and restless decoration became fascinating by the artistic renderings of the camera. Italian fields, more distant, found favour, and their wealth of purer detail of the fifteenth century was poured in from the camera, until now the elaborateness of the Renaissance from Spain finds expression in such grand national works as the recently erected Colonial Institute in London. There, too, modern examples of all the styles and periods may be found.

Thus during fifty years we have retraversed the ground of architectural styles of from the tenth to the sixteenth century. It must not be supposed, however, that the modern works in those styles are merely imitative. The older works are the text-books more liberally than ever placed within reach of the student architect by the generous camera. While thus accepting the spirit of the styles, new ideas have been evolved in adapting them to the modes and requirements of modern time. Apology need not be thought of for working from the past. The past is the soil out of which the future grows, and it is he who has studied the past most truly who is most fitted to deal with the present.

But what has assisted in bringing about all those rapid changes in architectural design? In my opinion, the camera is the chief factor. From its productions eager minds have been fired and prompted to visit and personally examine buildings and their details, to endeavour to grasp the lineaments which have produced successful effects in old work. If, then, such good results may follow the distribution of works from the camera, what an immense field yet remains for the architect amateur! His sketch-book comes to his aid. But who can afford the time and leisure required to make careful records of all detail of a building? Let the architect study his subject under the changing lights of a summer day, and mentally receive the impressions its worth may convey. Before leaving it, take the camera's impression, which can be done from the fraction of a second to three minutes. When home again, his memory will be awakened with all the features from his negative which pleased him on first acquaintance.

Among the many uses to which the architect amateur may apply photography as an aid in the practice of his profession, those, I have said, of a mechanical nature have been very fully treated by Mr. Penman. In my illustrations one or two further uses of that nature will be shown. It is chiefly as a means of instruction to himself and an education for others that I venture to advocate the architect making photography an indispensable study and practice in correlation to his art. While a building is in progress, the effect of details so far as executed is to be studied, that suggestions may be taken for remaining details in the situation. For new buildings, the site and surroundings should be studied. The camera here gives what a sketch could not comprise. For alterations and additions upon existing buildings the true proportions of that building to the eye should be known as only the camera can give them, and, from an enlargement thrown on a sheet of paper, the suggested additions can be tried in various treatments with a truer effect than by small scale hand sketch. For the study of architecture at home, the camera, lantern, and screen are invaluable. For lecture purposes, the best illustrations are from existing examples taken by the camera, and such cannot be had in detail from dealers, so have to be taken by the amateur.

The dissemination of art knowledge by means of the many very excellent illustrations weekly distributed from the camera makes it incumbent on the architect not to continue in the old ruts, but be continually seeking out more treasures; and so, out of a mind filled with a knowledge of the best examples, he may give forth only that which is true and beautiful. By the camera the best examples of old and modern work are weekly circulated among the architectural profession, so unknown gems of architectural art are distributed, and an increasing supply of new materials disseminated. As water poured into the pump of a dry well will start anew a water supply, so shall the supply of a knowledge of old forms inspire new. Life is too short, and architects might as reasonably deny themselves the use of the railway for travelling, and walk their tours instead, as refuse the gracious assistance of the camera. When the bicycle riders have all returned to walking, and steam goes no further than the fireside kettle, then shall I consider putting aside my camera. HIPPOLYTE JEAN BLANC, R.S.A.

TRI-SODIUM PHOSPHATE AND PYRO COMPARED WITH SODIUM CARBONATE AND PYRO.

IN the following are given the results of a few experiments made to determine the relative values of tri-sodium phosphate and sodium carbonate as developing alkalies in connexion with pyro. For the sample of tri-sodium phosphate used I am indebted to the Mallinackrodt Chemical Works of St. Louis. It consists of small six-sided prismatic crystals, some of which had slightly effloresced, intermingled with small amorphous lumps.

"Tests for carbonate" writes Mr. Milton B. Punnett in *Wilson's Photographic Magazine*, "showed that it contained little if any. When exposed to the air for a day or two, it still gave negative results; but after a week's exposure, also when dried in an evaporating dish on a steam-heated radiator, it absorbed carbonic dioxide from the air and effloresced quite freely when tested with acetic acid. The following formula, I think, will illustrate the change, although I have made no experiments to verify the supposition, nor does any authority at my command mention the matter:—

Tri-sodium phosphate.		Water.		Carbon dioxide.	
$2Na_3PO_4$	+	H_2O	+	CO_2	=
Common (di-)sodium phosphate.				Sodium carbonate.	
$2Na_2HPO_4$			+	Na_2CO_3.	

"I have seen it stated that it was this property of absorbing carbonic dioxide during the course of development that caused it to act as an accelerator. The sense of the original statement must have become changed, as the amount of carbon dioxide absorbed from the air during the course of development would be relatively very small, and, besides, the salt has in its pure condition a strong alkaline reaction.

"In making the developing tests the following solutions were used:—

A.

Crystallised tri-sodium phosphate	4 ounces.
Water	16 ,,

B.

Crystallised sodium carbonate	4 ounces.
Water	16 ,,

C.

Crystallised sodium sulphite	4 ounces.
Pyro	1 ounce.
Water	16 ounces.

"B and C are Seed's standard pyro-soda solution. The exposures were made on Seed's 26-sensitive plates to a sensitometer.

"*For the first Experiment* I took of B 4 drachms, and of C 4 drachms, with water to make 5 ounces of solution (regular pyro-soda developer). The high lights appeared in 12 seconds, and development was finished in 120 seconds. The negative had average density, printing speed, and clearness.

"*For the second Experiment* I took of A 4 drachms and of C 4 drachms, and added water to make 5 ounces. The high lights appeared in 24 seconds, and development was complete in 240 seconds. The negative was quite a little faster, denser, and hazier than that produced by the first experiment. As I had developed the plate in the first experiment to ten times the time of the first appearance of the high lights, I also treated the plate used in the second experiment the same (Watkins's method).

"*Third Experiment.*—In this experiment double the amount of phosphate solution as used in experiment No. 2 was taken, and a correspondingly less amount of water. The high lights appeared in 12 seconds, and development was complete in 120 seconds. The resulting negative was very dense and quite a little fogged. From Experiments Nos. 2 and 3 we see that, taking the time of appearance of the high lights as a basis, the

development proceeds much more rapidly with the phosphate than with the carbonate.

"*Fourth Experiment.*—With 6 drachms of the phosphate solution the high-lights appeared in 15 seconds, and development was finished in 120 seconds. This gave a denser and foggier plate than the regular soda developer used in the first experiment.

"*Fifth Experiment.*—I now returned to the same proportions used in experiment No. 2. The high lights appeared as previously in 24 seconds, but development was stopped at 120 seconds. Compared with the result in the first experiment (soda) the negative was brighter, but lacked speed and density. Comparative experiments showed that of two developers made up as in Experiments Nos. 1 and 2, the phosphate developer oxidised much more rapidly than the carbonate, and also gave an almost immediate precipitate of lime and magnesia when well water containing those ingredients was used, while the carbonate gave a precipitate only after standing some time.

"The conclusion drawn from these experiments is that, as an accelerator in connexion with pyro, tri-sodium phosphate has no advantage over sodium carbonate, but has the disadvantage of causing the pyro to change more rapidly; of being unstable when exposed to the air, thereby causing an uncertainty as to its exact constitution and power; of causing the developer to cloud the plate when hard water is used; and, finally, being much more costly than carbonate. Great advantages when used in connexion with metol have been reported, but a few comparative experiments have not borne out these claims.

"The greater rapidity with which development proceeds with the phosphate might be taken as an advantage, but it is only apparent and not real, as the same result can be obtained by increasing the amount of carbonate used.

"Whether the phosphate has less tendency to cause frilling than the carbonate can be settled by experiments made under the natural conditions prevailing in summer."

PHOTOGRAPHY AND THE IGNITION OF POWDER.

On Thursday, the 29th ult., Mr. W. D. Borland delivered a lecture, on *Caps and the Ignition of Powder*, to the members of the Gunmakers' Association, at the Lecture Hall of the Royal United Service Institution, Whitehall.

That the method of ignition of the powder of a gun charge has an influence upon its explosion has long been recognised, and, while with ordinary black powder it was not an unimportant matter that the precise manner in which the cap to be used behaved on detonation should be able to be investigated, with modern intense powder this matter is one of extreme importance. The methods that have been up to recently in use for determining the characteristics of the explosion of the cap seem to have been somewhat crude, and subject to accidents, which made them uncertain, even as far as they went. Mr. Borland, however, has attacked the subject in a truly scientific spirit, and, calling to his aid that invaluable recorder, the sensitive plate, has ingeniously contrived methods of attaining the end he had in view, which, while being far in advance of anything before attempted in the same direction, seems to leave little further to be desired.

The principal points to be determined about the explosion of the cap are—the size and shape of the flame produced, the duration of the combustion of its explosive material, and the heat produced; and these have to be taken in conjunction with the way in which the detonation has been effected, whether by a sharp blow, such as that of a small weight falling from a considerable height, or a dull blow, such as that from a comparatively heavy weight with a short fall.

The method employed by Mr. Borland for determining the extent of the flash is an extremely simple one; it consists of photographing the flash itself. The apparatus consists of a stand, having an arrangement for placing the cartridge case to be fired cap uppermost, the case of the cartridge being cut away to its base, so as to allow the flame issuing on explosion to be exposed. Immediately above the cap is placed an electro magnet, adjustable as to height to hold the weight, which, on cutting off the current, falls to cause the explosion. At a convenient distance is placed a small camera, with a repeating back, constructed to show the results of five successive experiments on a quarter-plate. The apparatus must, of course, be used in a darkened room. Mr. Borland finds it imperative to use a lens of the widest possible angular aperture—that employed by him working at *f*·2—and plates as rapid as they can be obtained, but they should be uniform in rapidity. He emphasised the importance of the same energy also being used throughout a series of experiments, and gave the preference to ferrous oxalate.

To determine the duration of the combustion, an equally ingenious piece of apparatus had been devised. A small electro motor was fitted with a contrivance to revolve a lantern-size plate at a definite number of revolutions per second. In front of the plate was placed a screen, having a narrow slit arranged so that the slit crossed the centre of the revolving plate. The plate being made to revolve, the cap was fired in front of the slotted screen, and, from the measurement of the broadening of the image of the slit, at a distance from the centre, the duration of the flash was calculated. The principle involved is exactly that of the well-known method of determining the speed of a shutter by means of the image of a bright spot on the periphery of a revolving wheel.

The apparatus Mr. Borland employs for determining the heat evolved consists of an adaptation of a thermopile with a swinging mirror, throwing a beam of light on a scale for recording the effect.

In the discussion which followed the lecture all the speakers testified to the advance Mr. Borland had made in the device of means of observing and recording matters in connexion with the action of percussion caps. One of them, however, pointed out that explosive materials which may be used for loading caps differed in the colour of the flame they produced in ignition, and that, on this account, an error might occur in a record made on a photographic plate, due to the difference in the actinic value of the light.

The lecture was illustrated with numerous examples of the results obtained with the apparatus described, lantern slides having been made from the negatives obtained, which were shown on the screen.

We have naturally referred more particularly to the means employed for producing the results shown, since that was the only part of the lecture of photographic interest. The principal object of the lecture was, however, to deal with the results themselves; and, as far as we could judge for ourselves, and from the remarks which followed it, Mr. Borland's improved methods of testing caps will be of great interest and value to the makers and users of guns and ammunition.

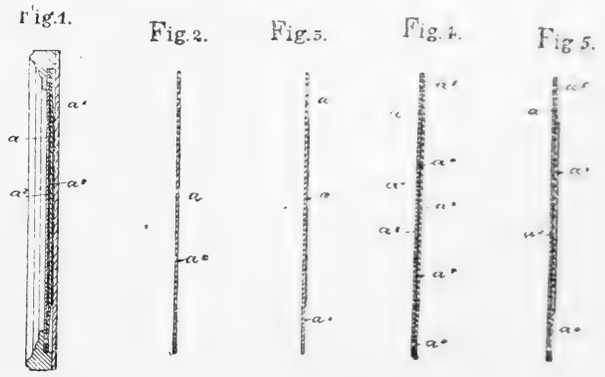
SERSHALL'S PROCESS OF COLOURING PHOTOGRAPHS.

A photograph with coloured effects, or a coloured photograph constructed or built up according to this invention, consists chiefly of two transparent plates of celluloid, gelatine, ivory, talc, or other suitable material of a like nature, fixed face to face or one upon the other at a certain stage in the process of producing the coloured picture, the one to constitute the front thereto, and the other the back. These two transparencies carry upon their surfaces sections or parts of the resultant picture, the one forming the front thereof having developed upon it the photographic print or film, and the other, which constitutes the back, the colouring matter for giving the coloured effect, and, when the same are put together during the process of working and their surfaces developed, the coloured parts of the back blend with the photographic positive upon the front, and form a beautifully finished portrait.

In the finished picture the position of the photographic film or print is between the two transparencies, so that it is protected from moisture, scratchings, and atmospheric action, and will not lose its tone or fade

Fig. 1 shows a section of a coloured photograph constructed according to this invention enclosed within a frame, and figs. 2, 3, 4, and 5 represent sections of parts of the same during the process of production.

In carrying the invention into effect a clean, transparent, thin celluloid plate, a (fig. 2), of any suitable dimensions is first taken, and upon one of its faces, a^2, is developed a photographic print or film, a^3, of the subject to be ultimately set forth, a section of the said plate at



this stage being shown by fig. 3. Any well-known photographic transfer process may be used for printing the image upon the celluloid plate, the said image being laid down thereon reversed or left-handed.

Another clean thin plate of celluloid, a^4, of any suitable size, is now placed with one of its sides face to face with that side of the first-named plate having upon it the photographic film or print, and the same are fixed together by suitable means in such a manner that they shall be perfectly rigid one to the other. A section at this stage is shown in fig. 4, the means of connexion of the two plates shown being soft metal rivets, a^5. Thus, so far in the process the transparency is built up of two fixed together celluloid plates, a, a^4, between the faces, a^2, a^6, of which is a photographic print or film, a^3, of the subject to be coloured. This transparency, as shown in fig. 4, has now to be coloured upon the outer face, a^7, of the plate, a^4, and this is accomplished, as shown at a^8, through the transparent nature of the celluloid, the same admitting sufficient light therethrough to enable the photograph to be painted through on to the said surface with great accuracy and effect, the affinity of the surface, a^7, as aforesaid, for the colours, helping greatly in the

operation. In speaking of the photograph as being painted through on to the back, a^7, of the plate, a^4, it does not mean of necessity the whole of the same, as only parts may be coloured to set forth the different points, but sufficient to blend with the photographic print and portray a lifelike and accurate representation of a photograph with colour.

To the painted surface, a^7, of the back transparent plate, a^4, is applied a coating of varnish, or its equivalent, which completes the production of the coloured photograph, after which the same can be framed in any suitable manner as shown in fig. 1.

The thickness of the celluloid plates may vary in relation to each other to effect a different shade or tint, in the ultimate product, and oil colours are preferably used to give the effects (being much deeper in their tone, and having for their application such an accommodating surface), but water colours may in some instances be more appropriate, in which case the face, a^7, of the transparency, a^4, to receive same may be, if necessary, prepared.

Glass is not intended to be in any way used as the transparent material of which the plates are constructed, as this material is well known as a transparency for photographic purposes, and would not give the results sought to be attained by this invention.

CAMERA CLUB CONFERENCE.

The Ninth Annual Conference of the Camera Club was opened on Monday evening by the President of the Club (Captain W. de W. Abney, C.B., F.R.S.).

The President's Address.

Captain Abney, in reviewing the progress made during the past year, said photography had been a good deal like a "quiet family;" there had been no births, deaths, or marriages, in the photographic family, and, consequently, there was nothing of very great interest to record as far as pure photography was concerned. The main subject which had attracted attention during the past year was the production of photographs in colour, and two processes had been brought forward, one very prominently by M. Chassagne and the other by Mr. Bennetto. Regarding the former, the recently published specification told a good deal, but how much of it was useful remained to be proved, and how much of it might be omitted had yet to be learned. It was clear, however, that a specially prepared plate was not essential to the production of the negative for that process, which appeared to be entirely dependent upon the print, and upon nothing else, a fact which his published opinions had anticipated. The preparation of the colouring solution was very remarkable, the number of chlorides employed in one of them being simply appalling. The experiments which he had seen carried out were apparently quite genuine, and the explanation of the results must probably be looked for in some chemical change that took place in the silver salt and the colouring matters employed. Of Mr. Bennetto's process all that could be said was that the results were excellent, and the time must be anxiously awaited when the secrets of the studio were revealed by the officials of the Patent Office. As distinct from chemical processes, there were also the "mechanico-chemical" processes of Mr. Ives and Dr. Joly, in which external aids were employed for the production of colour. Mr. Ives had attained in his kromskop an exquisite degree of perfection, and his work was carried out on scientific principles, and gave lifelike results. Captain Abney outlined the method of Dr. Joly, and showed three lantern slides produced by it, and proceeded to deal with a point which he thought might have some bearing on this kind of colour photography. Starting with the assumption that a red, a green, and a blue gave equal densities on a plate, and that, if each light were equally diminished, the densities remained equal if the exposure was more prolonged, he said he had already shown that time, exposure, and intensity of light, when a constant quantity, would not give the same result if the intensity was diminished, and also that the temperature of the sensitive surface altered the gradation of a plate and its comparative sensitiveness. He had now tested the relative sensitiveness to colour, or rather the gradation obtained from colour, and summarised the results which he had obtained. With an ordinary plate, whatever ray of the spectrum was used, the gradation remained the same with a diminished proportion of light; but, if, say, a violet ray and a red ray were made to give the same density, the density would not remain the same if the intensity of the rays were diminished; the red would be much steeper in gradation, and all trace of any action in the red would disappear long before the action in the violet ceased to appear. A curious factor was that an isochromatised plate followed the law of an ordinary plate where the isochromatism had no effect, but that all the parts rendered more sensitive by the isochromatising solution followed the steeper gradation; the plate thus contained, as it were, two sensitive salts—one the ordinary, or bromide, and the other the dye. It seemed that the plate was sensitive to rays in its bromide constituent, and in its colouring matter by those rays which could bleach or alter it in composition, the action of the silver salt in contact with the dye being a secondary action, the altered dye being the means of effecting the small change in the silver salt which enabled development to take place. Whether these considerations would enter into the question of colour photography he did not know; but, if so, they must also enter into ordinary photography, where screens were used, in which case the gradations would be more harsh, for instance, where a deep orange screen was used than where it was omitted, or where a lighter one was used. The President concluded with a few words about the Club and the Conference, saying that, although at the time of the last Conference everything was not rosy, happier circumstances were now prevailing, and that, when the Club was regarded as for the benefit of photography as well as of the members individually, the annual Conferences would be hailed with as much fervour as in the early days of the Club's existence.

Photography at Sea.

Captain Wilson Barker, F.R.S.E., read a paper, entitled *Photography at Sea*, in which he alluded to the wide scope afforded for the use of the camera on the ocean, where opportunities for its employment were generally regarded as few and far between. The ever-changing forms of clouds, weather phenomena, the flight of birds, zoological subjects such as the fishlike movements of penguins, beautiful islands and points of land, icebergs, vessels at sea, and innumerable other interesting matters, all suggested possibilities for photographic operations. For scientific and practical purposes, the camera could be brought into requisition for the determination of a vessel's keel, damage to sails, spars, or hull, collisions, the appearance of the shore from a good anchorage, the taking of lunar observations, and recording the appearance of surface organisms and deep-sea surroundings as seen through the microscope. Socially, the camera could be made the cause of much interest and amusement in the delineation of life on shipboard, and in procuring souvenirs of scenes and events occurring in the course of a voyage. Captain Barker showed a large series of slides of clouds, birds, fishes, deep-sea soundings, peculiar rocks, icebergs, collisions, the manipulation of sails, &c., the formation of waves on a vessel's side at varying rates of speeds, one illustrating the taking of lunar observations at sea for the determination of longitude, and many others. He regarded a hand camera, with a good finder and a spirit level, as the best for sea photography, and advised the use of cut films in preference to glass plates or rollable film.

Mr. R. Inwards, in the course of a brief discussion which followed the paper, said that the Earl of Crawford had invented a very clever camera for taking photographs at sea. It had been made by Mr. Hilger in 10×8 size, and appeared to be a most excellent piece of apparatus.

Dr. Charters White referred to the sharpness of some photo-micrographs of deep-sea soundings which had been shown, and

Captain Barker said a little of the sounding was smeared on a slide as soon as it was taken from the sea, dried over an electric light, and at once placed in the microscope, so that the photograph was taken within a few minutes of the sounding being taken.

The President suggested that an attempt should be made to secure photographs of halos, which Captain Barker had said had not yet been done. The process of taking longitude by lunars was now a *fait accompli*, owing to the researches of Captain Hills, whose instruments were now carried by expeditions into many parts of the world, and used with much success.

A vote of thanks was passed to Captain Barker.

Architectural Studies.

The Conference was resumed on Tuesday evening, when Mr. Bendall took the chair, and

Professor F. J. Allen, M.A., M.D., read a paper on *Architectural Studies, with Hints to Amateurs*. Vulgar, modern civilisation, he said, was fast destroying or changing the beautiful buildings which our more refined ancestors bequeathed to us, so that it behoved every photographer to make systematic records of such buildings as came within his reach, and to leave his collection of negatives as a gift to posterity. As an instance of the advance of civilisation and its effect, he showed two views of Shepton Mallet Church; one taken in 1882, with an old inn in the foreground and some picturesque old buildings in the middle distance, and the other taken recently, when a gaudy gin-shop had replaced the inn, and a huge and ugly technical school had blocked the view of the tower—symbolising the eclipse of religion by science. It should be a truism that in photography everything depends upon the lighting, yet few photographers seemed to realise this fact. Personally, he preferred direct sunlight, which, if the proper time of day was chosen, enabled one to render delicate details and gradations of surface more effectively than diffused light. Before photographing a building it was advisable to visit it at leisure, and, by observing its orientation, to calculate the hour at which the light would fall upon it at the most suitable angle. Halation formed a great drawback to architectural photography, and could be detected in most prints presented to one's view. It depended more on the intensity of the light than on the duration of exposure, and was as prevalent with rapid and thickly coated plates as with ordinary plates. He backed every plate, either for negatives or lantern slides, with a solution of asphaltum in chloroform, which he did not remove until after development. Halation could not be so readily prevented with isochromatic plates, because the plate was, to some extent, sensitive to the coloured rays reflected by the backing. In seeking subjects for photographic record one must not be content with great and striking buildings, such as cathedrals, abbeys, and castles, but the smaller details of such structures would afford ample scope for study, particularly specimens showing the dawn of architecture in

England from the eighth to the eleventh century, the relics of which period were of great historical value. Many workers were afraid of wide-angle lenses, on account of the extreme perspective effects sometimes produced by them, but the fault lay rather in the way the lens was used than in the lens itself. Photographs of the tower of Shepton Mallet church, taken from varying distances with lenses of different foci, were shown to illustrate the effects of different lenses. With regard to perspective, writers on photography almost invariably insisted upon the necessity of having the camera back absolutely perpendicular; but in many instances this was a mistake, as the result was that buildings, through being too upright, appeared top-heavy. As one was accustomed to see perpendicular lines converge upwards, it appeared unnatural to see them quite parallel in a picture; it was necessary, in taking a photograph, to aim at a compromise between absolute perspective and absolute perpendicularity. In travelling with a hand camera, one need never neglect a good subject from fear of perspective distortion, for the perpendicular could be rectified by copying the negative, the sensitive surface and the original negative being sloped towards each other at the same angle. In this connexion it was important to remember that, the narrower the angle, the greater was the slope required, and in copying distorted pictures it was therefore desirable to use a wide-angle lens. Certain subjects, such as ceilings, vaultings, &c., could not be properly represented except in so-called distorted pictures, which, however, gave an approximately accurate rendering of the appearance seen when looking up into a roof. Upon the subject of focussing, the lecturer said that, as a physiologist, he was inclined to give a physiological explanation of the difference in the opinions held by photographers upon the subject of definition. It appeared to him that the persons who favoured indistinct pictures were those who had some defect of vision, such as short sight, which caused them to see all objects indistinctly unless they were brought close to their eyes. A picture in which everything was sharp would appear to such persons as unnatural, and hence they regarded a fuzzy picture as naturalistic. On the contrary, a person with correct vision saw sharply everything at which he looked, and felt giddy when looking at a picture which he could not focus. There was no pictorial danger in correctly focussing every part of a picture, for the eye saw distinctly only a very limited area on the centre of the field, and a part at a little distance from the centre would fall into indistinctness, quite as naturally as if it were out of focus.

Mr. Webber expressed his astonishment at the statement that isochromatic plates were more liable to halation than ordinary plates, and held strongly to the opinion, in which he was fortified by considerable experience, that the lecturer was in error on this point.

The Rev. F. C. Lambert expressed some difference of opinion with Professor Allen upon the subject of sharp definition, and suggested that, if each one of a row of pillars, one behind the other, or nearly so, were brought to an equal focus on the negative, an effect would be produced contrary to that which one actually saw.

Mr. A. Pringle said that to him all the pillars would appear equally sharp. This was a recurrence of the old question of normal vision, a question which had been discussed over and over again, and as to which he thought a definite settlement would never be arrived at.

The Earl of Crawford thought the whole of the picture should be perfectly sharp, so that, on turning the eye to any one point, that point would be as clearly defined as if one viewed the original in the same manner.

The Rev. Courtney Gale also dealt with this point, and, upon the question of halation, said that, when a perfect isochromatic plate was produced, of which there was no prospect, there would be no halation, or such a plate would be black, and would absorb all the rays of light which impinged upon it.

Mr. C. Hussey decried the use of asphaltum backing, and said caramel and burnt sienna, mixed with methylated spirit, was much to be preferred for the purpose.

After further discussion, a vote of thanks was accorded to Professor Allen, and the Conference adjourned.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

Annual Exhibition.

This, the Twelfth Annual Exhibition of the Society, is being held in the Exchange-rooms, New-street. So far as mere numbers are concerned, the Exhibition under notice does not compare favourably with those of the last few years, but the falling off is in numbers rather than quality.

There are twelve classes, open and closed, and, in addition to the competitive work, there is, or rather will be, for at the time of writing it was not to hand, an exhibition of work by Messrs. Ashton, Robinson, Brooke, Golding, Greger, Cadby, Lambert, Alfieri, Warren, and Horsley Hinton, the latter being responsible for the collection of the works.

Each evening there will be a lecture, illustrated by views, by by Messrs. Perkins, Wright, Barrow, Taylor, Jones, and Snowden Ward, preceded by a series of animated photographs, shown by Mr. C. S. Baynton.

Class I. (Open, Landscape) is uniformly good, the majority of the work leaning to the sombre side of nature, parting days, lonely locks, wintry waysides, and frozen marshes indicating the tenor of the class. The Judges award first place to an *Evening on the Moor*, by F. A. Bolton, very closely followed, we should say, by *On a Sussex Common*, by Charles Job, *On the Dooey*, a deserted-looking estuary, by F. Coop, taking third. A group of cygnets and swans, by H. P. Clifford, is a success, as also *Low Tide*, by H. W. Bennett.

Class II. (Seascape, open).—Here the first is awarded to W. T. Greatbatch for *Sunset*. Another *Sunset*, of a subdued and harmonious nature, is bracketed with *Eventide*, by Mr. Beethand, for honourable mention. *Low Tide*, by Smedley Aston, is a work which only seems to lack a little brilliancy to make it more successful; while *The Wreck*, by C. E. Cowper, might well have been noticed.

Class III. (*Genre* and Figure Subjects) is a heterogeneous collection, including portraits, groups, nude studies, and what not. Percy Lankester gets a silver medal and certificate for *A Portrait Study* and *Irene*, which is just as much a portrait study, and a bronze medal is awarded to Mr. Greatbatch for his *Village Blacksmith*, a good interior, with the smith before the anvil. Another forge, by W. E. Stevens, is good, but a trifle too full of detail. The class contains many of those artificial interiors which too plainly betray their nature, and to one such, *Cupboard Love*, by T. Lee Syms, a certificate is awarded. Some large direct heads, by Byrne, are in his well-known style.

Class IV. (Enlargements)—Two local men, Messrs. Baynton and Greatbatch, well hold their own, and take the awards, well backed by another local worker, Smedley Aston, whose *Contemplation* is a good work. *Une Reverie*, by Mr. J. P. Croft, is a nude study, well lighted and effective.

Class V. (Lantern Slides, open).—A very strong class, Mr. Beetham taking a silver medal for a series of hoar-frost studies; Mr. Greatbatch takes one also for a series of architectural details. A series of kitten studies, which will, no doubt, prove very popular on the screen, by Mr. Ferguson; a series of flower pictures, by C. J. Fowler; and a series by Mr. Baynton, secure bronze medals; while Mr. Bagnall and Mr. Bull obtain certificates—rather a formidable series of awards for a class of sixteen.

Class VI. (Home Portraiture).—Dr. Hall-Edwards takes first position with a man's head, of good gradation, and rather a favourable subject. Mr. Greatbatch takes the second award for a portrait of a young lady. *Sweet Marjorie*, by S. P. Croft, and an old man's head, by Greatbatch, are also good.

Classes VII. and VIII. (Architecture) are wofully weak in numbers for Birmingham, where we usually see such fine architectural classes. In the former Mr. Baynton takes top place with *Bolton Abbey*, a detail which would have been improved by leaving the gate open. Mr. Fowler's doorway and Mr. Underwood's portion of *Buildwas Abbey* are both excellent. Of the interiors we prefer P. T. Deakin's *Market-place*, but this takes second place to Mr. Baynton's *Crypt, Gloucester*, a carbon print treated in a novel manner. Mr. Fowler again shows excellent work in *Lincoln Cathedral*.

Class IX. (Landscape, closed) is a large and, we should think, difficult class to judge. The three medals are all given to Greatbatch. *Where Reeds and Rushes Grow* is a fine work, and so is *Low Tide*, which sounds a strange title for a landscape; but there are several works we prefer to *A Cool Spot*, notably *The Rugged Path*, by J. P. Croft, and *Evening*, by Smedley Aston.

Class X. (Flowers, Fruit, and Plants).—Mr. Fowler here scores with narcissus, closely followed by *A Grassy Bank*, by Greatbatch.

Class XI. (open to members who have never won a prize) is divided by Mr. Gare and Mr. Barnsley.

In the Survey Class there is a fine display of work in carbon and platinum, and the cause will reap much benefit from this competition. Mr. Baynton shows a fine series of *Cheverel Manor*, of George Eliot, and its immediate district, and Mr. Greatbatch shows an equally interesting series of the district around Compton Wyniates. These two exhibitors take a silver medal each, and Messrs. Deakin and Moore certificates.

Three years ago the Birmingham Society instituted a challenge cup award to the most successful exhibitor at the annual competitions. Mr. Greatbatch, having this year won the same for the third time in succession, claims the cup as his property.

Our Editorial Table.

The Austin-Edwards Setoloid Films.

Manufactured by Austin Edwards, Park, Tottenham, N.

We have recently tried some of the Austin-Edwards Setoloid films, and were extremely pleased with them. Setoloid has been introduced as a substitute for celluloid as a support. Its physical properties are all in its favour. It resembles celluloid as regards thickness, and in the dark slide and the developing dish it remains quite flat. Time and experience will show whether setoloid is inert as regards the keeping properties of gelatine emulsion superimposed upon it; but, in the meanwhile, there can be no doubt that the new substance is a serious rival, not only to celluloid, but to glass, as a support for sensitive films.

Edwards's Zylo Paper.

B. J. Edwards & Co., The Grove, Hackney, N.E.

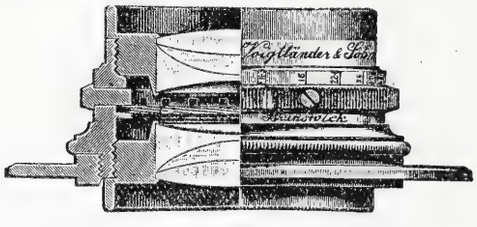
The new printing surface which Messrs. Edwards & Co. have introduced is a collodio-citro-chloride paper. It is made in three tints—white, pink, and mauve—and with glossy and matt surfaces. There are two qualities: first quality, glossy and matt surface; and a specially prepared paper, glossy surface only, for professional use. The paper in our hands exhibits all the good qualities of a collodion printing surface. It tones easily and evenly, and to a good colour in the ordinary sulphocyanide bath. The whites are pure, and the film does not split or crack. Altogether, Zylo is an admirable paper of its class, and is assured of considerable popularity among users of print-out papers.

Voigtlander's Lenses, Series II. and IV.

Manufactured by Voigtlander & Son, Brunswick, and 92 Hatton-garden, E.C.

In the Journal of January 22 last we reviewed one of the latest productions of Messrs. Voigtlander—namely, their Series III. lens, working at *f*·7·7, an objective suitable for a variety of purposes, constituting it of universal utility. More recently Voigtlander lenses of two other series have been entrusted to us for trial.

Series II.—This series is designed for hand-camera and instantaneous work. The aperture has accordingly been opened out to the fullest available extent, viz., *f*·5·6. We were surprised to find that a No. 2 of the series, of $4\frac{3}{4}$ inches equivalent focus, very well covered a half-plate, although of course the acme of definition was not obtained at the margins; by diaphragming down to *f*·8, however, the half-plate is well and easily covered. On the quarter-plate, at full aperture, the definition is exceedingly fine and crisp, the illumination even, the field flat, and the errors of spherical aberration and astigmatism not apparent. This lens should prove an excellent instrument where short exposures are essential, for it appears to have been corrected so as to reduce the aberrations to the minimum.



Series IV.—This lens is intended exclusively for work of a wide-angle character, where, of course, rapidity of exposure is not a desideratum. Its full aperture is *f*·11·3, and a No. 5 of $10\frac{1}{4}$ inches equivalent focus covers a 11×9 plate, thus embracing an angle of 75°. At *f*·32 a 12×10 plate is covered. The field of the lens is remarkably flat, and, as befits an objective of this character, its defining power is unexceptional. We could detect no astigmatism of the image. There is no doubt of the Series IV. proving an invaluable instrument for reproductions, copying architecture, and allied purposes. The Voigtlander lenses are noted for beauty of finish and purity of glass, and are well calculated to hold their own in the field of photographic optics.

Catalogue Received.

Clement & Gilmer, 8 and 10, Rue de Malte, Paris.

Messrs. Clement & Gilmer's Catalogue is mainly devoted to a description and prices of their apparatus for taking and projecting animated photographs. The usual projection accessories are also referred to in the catalogue, which gives a list of cinematographic films that are available.

On Sea and Shore.

Published by the Aberdeen Steam Navigation Company, 102, Queen Victoria-street, E.C.

This is a capitally written account of a trip to the Highlands, the journey to Aberdeen being performed aboard one of the Company's favourite vessels regularly plying to and from the granite city. There are many illustrations of Scotch scenery, and the book includes a great deal of information calculated to be of use to the tourist availing himself of the Aberdeen Company's service. Page 14 contains a life like picture of a famous steward of the line, Mr. W. Atkins, who is known to many readers of this Journal. With a camera for a companion, what could be a pleasanter way of approaching Scotland than on board one of the Aberdeen's well-appointed ships?

The "Yalus" Hand Camera.

Adams & Co., Charing Cross-road, W.C.

This is a low-priced hand camera of great excellence. Among its principal features may be mentioned a self-capping ever-set shutter, which admits of time and instantaneous exposures, and is regulated for various speeds, two finders, showing a brilliant image, and an excellent single lens. It takes sheaths for plates or films, and this brings us to the changing method, one of the simplest, as it appears one of the most certain yet devised and introduced. The sheaths



bear against an inclined plane, the consequence being that the front sheath is always elevated above the rest, and being readily grasped through a cloth bag, is easily removed to the rear, No. 2 sheath then being ready, and so on throughout the twelve. As we have just said, the changing method is simple and certain, and should make the "Yalus" very popular.

News and Notes.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, May 12, at eight o'clock. Members' Open Night.

Royal Photographic Society.—Ordinary Meeting, Tuesday, May 11, at eight p.m., at 12, Hanover-square. *Portraiture*, by Mr. Harold Baker. Mr. Rogers, of Watford will show his acetylene burner for portraiture.

Death of Mr. M. Carey Lea.—We are sorry to learn, at the moment of going to press, of the death of Mr. Carey Lea, which took place recently at Philadelphia. An account of the deceased gentleman's photographic labours will appear in our next.

The Prestwich Camera for Animated Photography.—We are pleased to learn that this ingenious and compact camera for animated photography, which we noticed at length on April 16, is meeting with success. It is made by the Moto-photograph Supply Company, 744, High-road, Tottenham, N.

New Companies Registered.—Radiotint, Limited. This Company has been registered by Messrs. Cheston & Sons, Great Winchester-street, E.C., with a capital of 100,000*l.* in 1*l.* shares. The object of the Company is to make, produce, buy, sell, or otherwise deal in, photographic and other pictures, whether coloured or uncoloured, to enter into an agreement with John Ornstein, and to carry on the business of manfacturers of, and dealers in, chemical compounds and any photographic materials, photographic artists, printers, publishers, dry-salters, chemists, druggists, oil and colourmen, makers of, and dealers in, proprietary articles, &c. The subscribers are W. Thompson, 32, Chandos-road East, Leytonstone; B. Young, 58, Fullerton-road, Wandsworth, S.W.; G. Dickson, 31, Howland-street, Fitzroy-square, W.; H. T. Yarman, 66, Park Grove-road, Leytonstone, E.; C. W. Morgan, 110, Croydon-road, Anerley, S.E.; J. F. Norris, 13, Alkham-road, Stoke Newington; W. Warman 67, Newington Butts, S.E. The first Directors are not to be less than three, nor more than seven. They are to be nominated by the subscribers; qualification, 200*l.*; remuneration, 200*l.* each per annum (an extra 150*l.* for the Chairman) and a percentage of the profits.—Eastman Kodak Company, Limited. This Company has been registered by Messrs. Kerly, Son, & Verden, 14, Great Winchester-street, E.C., with a capital of 2000*l.* in 1*l.* shares. The object of the Company is to carry on the business of manufacturers of, and dealers in, photographic materials and apparatus, photographers, photograph dealers, &c. Registered without Articles of Association.—Northern Photo-engraving Company, Limited. This Company has been registered by Messrs. Hooper & Son, Ludgate-hill, E.C., with a capital of 4000*l.* in 10*l.* shares. The object of the Company is to acquire and carry on carry on the business of photo-engraving and zincotyping carried on at Manchester as Messrs. E. & J. Spencer. Qualification, 100*l.*; remuneration to be fixed by the Company. Registered office, 14, Barton-square, Manchester. Automatic Photo-printing Syndicate, Limited. This Company has been registered by Messrs. Mellor & Co., Moorgate-place, E.C., with a capital of 10,000*l.* in 1*l.* shares. The object of the Company is to acquire, under a certain agreement, the patents and patent rights of Mr. W. Friese-Greene and his assigns, in respect of his inventions for the production of prints by photography, and to carry on the business of printers, photographers, lithographers, publishers, stationers, &c. Qualification, one share; remuneration, fifty guineas each per annum.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—A meeting of Council was held at the rooms of the Royal Photographic Society, by kind permission of the Council, on April 28, Mr. R. Beckett in the chair. The Secretary reported that the Council of the Royal Photographic Society had stated that it was unable to take over the pension fund of the Association or to appoint a Benevolent Committee for that purpose. The Secretary was therefore instructed to take legal advice, and under such advice to transfer the funds to a Benevolent Committee appointed by such photographic society as might be acceptable to the Registrar of Friendly Societies.

Patent News.

THE following applications for Patents were made between April 20 and April 24, 1897:—

PORCELAIN PHOTOGRAPHS—No. 9916. "A Process for Producing Photographic Pictures on Porcelain." J. F. FRITSCH.

OPAQUE PROJECTIONS.—No. 9932. "Improvements in Apparatus for Projecting Representations of Opaque Bodies upon a Screen." Communicated by P. Picard. H. H. LAKE.

OXYGEN.—No. 9953. "An Improved Retort to be used in the Manufacture of Oxygen Gas from Atmospheric Air." C. E. MELVILLE and J. HORNE.

PHOTOGRAPHIC PLATES.—No. 10,098. "Improvements in Photographic Plates.* Complete specification. M. LEVY.

COPYING PHOTOGRAPHS.—No. 10,265. "An Improved Method for Making Plans from Photographs and Apparatus for applying the Method." J. B. LEE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
3.....	**Ashton-under-Lyne**.....	Excursion: Compstall. Leader, Major Bradley.
3.....	**West London**	Excursion; Brent Junction.
0.....	**Aston**	Committee Meeting.
0.....	**Halifax Camera Club**.....	*At Home Subjects.* W. Thomas, F.R.P.S.
0.....	**North Middlesex**	*Plate-backing Convenience for Amateurs.* W. E. Debenham.
0.....	**Stafford Y.M.C.A.**	Exhibition of Prints, Lantern Slides, and Negatives taken on Easter Monday.
1.....	**Ashton-under-Lyne**.....	Excursion: Bramhall. Leader, S. Sharp.
1.....	**Birmingham Photo. Society** ...	Social Evening.
1.....	**Hackney**.....	*Astronomical Photography.* W. Taylor.
1.....	**Isle of Thanet**	*Enlarging.* John A. Hodges.
1.....	**Royal Photographic Society** ...	*Portraiture.* Harold Baker.
2.....	**Photographic Club**	Members' Open Night.
3.....	**Aston**	Microscopical and General.
3.....	**Bradford Camera Club**	*Carbon Printing.* W. T. Wilkinson.
3.....	**London and Provincial**.....	*Negative-making.* Chapman Jones, F.C.S.
4.....	**Bournemouth**	Annual General Meeting.
4.....	**Ireland**	Smoking Evening.
4.....	**West London**.....	*Actinometer and Slide-rule.* T. Coysh.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 29,—Mr. Robert Beckett in the chair.

Mr. P. EVERITT showed a couple of small interiors of Southwold Church, and said they were taken with a three and a half inch focus Steinheil lens (type No. 2), at *f*·10, with an exposure of a minute and a half. By using a small size and a short focus lens, it showed the facility given in taking interiors, the exposure being one-tenth what it would be under ordinary conditions.

Mr. E. H. Bayston showed two prints, one being from the original negative, the other an enlargement. The latter was made in an ordinary camera, without special enlarging apparatus.

The feature of the evening was a display of slides dating back as far as forty years ago, consisting for the most part of hand-coloured scenes, with many humorous effects produced by mechanical means.

Mr. T. E. Freshwater led off with a number lent by Messrs. Newton & Co., which, being too large for the lantern, were passed round. Amongst them were representations of the heavenly bodies in different phases, skeletons of extinct animals coupled with human skeletons for comparison of size, and several amusing extravagances; also, upon the screen, some more modern work, coloured by Japanese artists.

Mr. W. D. WELFORD, through the kindness of Mr. W. C. Hughes, contributed others of like character, causing some degree of merriment, and a couple of smoked glass slides, upon which intricate patterns were traced in the lantern.

Votes of thanks were accorded to the above for their displays.

PHOTOGRAPHIC CLUB.

APRIL 28, Mr. Frank Haes in the chair.

Mr. Dowell was elected a member of the Club.

Circulars containing information as to the forthcoming Convention were distributed.

Mr. FOXLEE showed some interesting and well-preserved photographs which he described as pseudo-enamels. These appeared to consist of collodion positives on glass, the latter being cemented upon opal or pot metal, so as to hermetically seal the image.

Mr. Frank Haes presented a ceramic enamel by Lafon de Camarsac, and also a Decoudun's photometer for the Club Museum. He was heartily thanked for his gift.

Mr. BRIDGE suggested a vote of thanks to the editors of the Annual Report of the Club, which had just been published. He said that a book of that kind was not compiled without work, and he thought the Club would like to thank the workers, Messrs. Thomas Bedding and S. H. Fry.

Mr. FRY acknowledged the vote of thanks on behalf of Mr. Bedding and himself. He was sure, he said, that he might say on Mr. Bedding's behalf, and he had no hesitation in stating for himself, that their joint labours were given with a sense of pleasure at being able to do work for the Photographic Club. That the members appreciated their labours was a source of further gratification to them.

A considerable gathering of members and visitors had come to see the

REPRESENTATIVE SETS OF LANTERN SLIDES

collected by Messrs. Bridge and Welford. These were passed through the lantern, and some good-humoured badinage was indulged in between the rival supporters of the two sets. The slides exhibited as illustrative of the work done by Club members before 1890 were contributed by Messrs. Wellington, Hastings, Cembrano, and Klosz. Mr. Welford's collection was contributed by Messrs. Howard Esler, Evelyn Barrow, C. H. Oakden, George E. Thompson, Edgar R. Bull, H. E. Farmer, W. Rice, W. A. Farmer, U.S.A., Edgar G. Lee, George Hankins, Paul Martin, Mrs. Welford, and Mr. Walter D. Welford.

A discursive discussion took place after the exhibition, in which Messrs. THOMAS, OAKDEN, GEAR, HASTINGS, BRIDGE, NESBIT, and TOTTEM took part. The drift of the remarks was that lantern slides could be good or otherwise from a double standpoint, viz., that of technical excellence and pictorial. From the former standpoint the Club slides made before 1890 could hardly be beaten, but the subjects were limited to either pretty landscape or some dramatic incident suitable for a hand-camera shot. The collection shown by Mr. Welford, however, combined an equal technical excellence with a fine pictorial interest, and the subjects of the pictures and their treatment were of a different and a later school of photographic pictorial art. It was agreed, *nem. con.*, that no deterioration of slides had taken place if the present-day work might be judged by the admirable and charming set collected by Mr. Welford, which were unreservedly praised.

The meeting unanimously thanked him for the opportunity of seeing what may perhaps be described as one of the best collections of pictorial lantern slides ever got together.

Croydon Camera Club.—The Easter-tide meetings have been unusually interesting and well attended. Mr. A. P. WRATTEN, A.R.C.S., gave two papers—(1) on *Development by Timing, instead of Inspection*, and (2) *The Ferrous-oxalate Intensifier*, the latter of which we hope to, later on, print. Mr. J. Smith conducted a large party of members, who nearly filled a first-class saloon carriage, on Good Friday to Guildford and Shalford, where, despite rain and rough weather, both photography and fun were indulged in. On Wednesday, April 28, the fifth Annual Rummage Sale was held, when between thirty and forty members attended to pick up bargains, the hammer being wielded by Mr. J. Allbright. The afternoon of May Day was devoted to a visit to the Sandell Exhibition, a large concourse of members assembling at 3.30 at Rochfort Tower, where they were received by Mr. and Mrs. Sandell, by whom various interesting technical points, illustrated by some of the numerous and magnificent prints on the walls, were pointed out and explained. A thoroughly enjoyed time was spent in the inspection of the 400 or more prints, which, displayed in four large rooms, bore eloquent testimony alike to the remarkable quality of the multiple-coated plates, in not merely obviating halation, but in the perfection with which they render the finer and more delicate gradations of light half-tone, and to the great taste and technical skill of Mr. Sandell, by whom all, or nearly all, the photographs on view were taken. In the course of the afternoon two 15×12 groups of the party were taken under the direction of Mr. Sandell, who subsequently developed them before his fellow members, in order to illustrate his method of treating the multiple-film plate.

Croydon Microscopical and Natural History Club (Photographic Section).—April 23, Mr. A. P. Hoole presiding.—Mr. A. HILL gave a demonstration on

URANOTYPE,

from which it would appear that the properties of this paper are quite unique. In some respects it resembles platinum paper, in the matter of colour carbon tissue, while in others it has peculiarities all its own, notably in that, if kept long (unless in a calcium tube) after printing, the image entirely disappears, and the paper can be used for printing again as though it had never been used before. Place the dry paper behind the negative in the frame, using a rubber backing, and print till all detail is visible (in sunlight by preference). It is better to over-print than under-print, as over-printing is easily remedied, but nothing can be done with an under-printed picture. If the prints cannot be developed at once (the same day), keep them in a calcium tube till they can be. If the printing has gone too far, there are three ways of correcting this. Before development the prints may be kept for two, three, or four days, as mentioned above, when spontaneously they will go back. After development, when you can be quite sure about the over-exposure, reduction may be effected, either by washing in plain water, or, if very much over-exposed, by the addition of a mere trace, say one minim in half a pint of ·880 ammonia to the washing water, till the desired effect is produced. After printing, wash the print for, say, ten minutes in several changes of water, but not in running water, and proceed to develop either by gaslight or weak daylight. Take ferridcyanide potassium, 1 ounce; water, 8 ounces. This may be brushed over the prints or used in a dish, and gives a clear, bright Bartolozzi red. Glycerine may be used here (as in platinotype), as a restrainer or for local develop-

ment, and, by further dilution, the developer is kept more under control, and a softer result is obtained. If a red print, previously well washed in water acidulated with citric acid, is brushed over with a solution containing 60 grains of sulphate of iron in 6 ounces of water, it slowly changes to sepia, then to olive green, and, finally, to art green, and can be stopped at either of these points by immersion in the fixing bath, which is a ten per cent. solution of citric acid. If a red print is brushed over with a solution containing 60 grains of nitrate of cobalt, and 60 grains of sulphate of iron in 2 ounces of water, then a green colour is obtained. A green print may be turned into a blue one by the agency of glacial acetic, nitric, or hydrochloric acids. Purple tones may be got by over-exposure, well washing, and a solution of 4 grains to the ounce of gold chloride. Several colours may be obtained in one print by the judicious choice of developers; thus it is obviously possible to obtain a blue for the sky, a green for the sea, and a reddish-brown for buildings surrounded by green foliage; in fact, by no other process at present known can such a variety of results be obtained.

Dulwich Photographic Society.—The Annual General Meeting of the above was held at the Constitutional Club, East Dulwich, on April 27. Although a young Society, the Secretary's report showed that the Society is in a most satisfactory condition financially, besides showing a large increase in the number of members. Several lantern entertainments were given during the winter season, all of which were well attended. A very successful Exhibition was given in November last, when the majority of members exhibited. The following officers were elected for the ensuing year:—*Chairman:* Mr. H. C. Jackson.—*Committee:* Messrs. Mitchell, Beer, Thomas, Townley, and Bemister.—*Curator:* Mr. Pope.—*Hon. Treasurer:* Mr. C. Dunlop.—*Excursion Secretary:* Mr. F. Thomas.—*Hon. Secretary:* Mr. A. E. R. Scarlett. It was arranged to hold the first Annual Supper of the Society on May 18 next at the Montpelier Hotel, Choumert-road, Peckham.

South London Photographic Society.—At the last meeting of this Society, the President (Mr. F. W. Edwards, F.R.P.S.) in the chair, seven new members were elected and six others nominated. Mr. T. E. H. Bullen attended and gave an address on

A New Film.

He first gave a history of the various flexible supports which had been tried from time to time since Fox Talbot endeavoured to find one in 1851. Celluloid was now practically the recognised film support for negative work, and those who were in the habit of using it found certain defects connected with it. The cost of it was greater than glass; there was a certain amount of curling in development; and there was a certain chemical action which went on with celluloid which was very detrimental to the emulsion. In the new film there was no celluloid. It was a film of gelatine, without any paper support. It differed from ordinary gelatine, inasmuch as it was impervious to water. Once the film was moistened, it remained perfectly flat in the dish, and there was no need to touch it again. In use the film was better placed in a simple carrier, such as was shown. There was nothing in this film which could chemically act upon the sensitive emulsion. In development, it was absolutely necessary that the developer should be poured into the dish first, and the film pushed into it; or, in the alternative, the film could be moistened first under the tap. It was possible to develop as many films as the dish would hold, as they did not scratch or curl. With regard to washing, there was no reason why any plate should be washed for eight or ten hours. If running water was used, three quarters or one hour was quite sufficient. Before finishing the drying of the negative, there was one other process which must be gone through, viz., the placing of the film in a solution of glycerine (one in thirty), or, better still, a twenty per cent. solution of sugar and water for five minutes, which prevented the films from becoming brittle. Drying was best done by pinning the films to the edge of the shelf, and occupied about seven hours without heat in a good current of air. Varnishing was optional; but, if it was done, celluloid varnish was the best to use. One great advantage these films had over celluloid was that they gave less halation. In answer to questions, Mr. Bullen said any excess of glycerine could be washed out by the use of running water. Methylated spirit could not be used, as it made the film too brittle. There was no tendency to dampen in wet weather. There was no more straining than with plates.

Aintree Photographic Society.—The first excursion of the season was held on Saturday last to Lathom House (the seat of the Earl of Lathom) and district, under favourable circumstances as regards weather, &c. The party, numbering twenty-seven, left Exchange Station, Liverpool, at 1.48 p.m., by train to Ormskirk, and drove thence to Lathom, which was reached about 3.30. After inspection of grounds, garden, conservatories, and chapel, the return journey was commenced about 6 p.m. as far as Ormskirk, where tea was provided. A visit was subsequently made to the ancient church, and, although it was rather too dark to inspect the edifice, the electric organ claimed a large amount of attention. The party arrived back in Aintree about 9.30, having fully appreciated the outing, which, whether being successful photographically or not, proved thoroughly enjoyable otherwise. The number of exposures was sixty-four.

Bath Photographic Society.—April 28, Mr. G. F. Powell (President) in the chair.—The Chairman introduced Mr. W. Rossiter, who had been announced to read a paper, entitled

Some Picturesque Manor-houses around Bath,

which was well illustrated with slides, taken to emphasise the leading features of architecture. All of the examples shown were familiar to the members of the Society, some of the scenes depicted having been visited by them on more than one summer excursion. The lecturer treated his subject in a broad manner, and, after a few prefatory remarks on the possibilities of art and romance in photography, spoke of the special adaptability of the craft to these old houses. He spoke of their architectural styles, and described and criticised many of them, giving special attention to the Elizabethan period, and showed how rich the neighbourhood is in elegant examples of the particular style. He spoke of their history and associations, and, in fact, gave a concise history of each of his examples. Of the pictures, perhaps the most worthy of notice were those of St. Catherine's Court, Hamswell House, and South Wraxall Manor, though many others might well be mentioned.

Leeds Camera Club.—The above Society has held many highly successful meetings since its inauguration some five years ago, but none has been more satisfactory to all concerned than that on Friday, the 23rd ult., when the large Club-room at the Grand Restaurant was crowded to excess to hear Mr. A. Horsley Hinton lecture upon

Practical Pictorial Photography.

Mr. Horsley Hinton has long been acknowledged one of the leading producers of, and writers upon, pictorial landscape photography from its purely artistic standpoint, but Yorkshire photographers have discovered that he also excels as a lecturer. Dividing his subject into three sections—motives, methods, and materials—Mr. Hinton treated each stage in a most exhaustive manner, yet, withal, with such delightful diction that quite fascinated his audience. The frequent bursts of applause showed how closely his words were followed and how greatly they were appreciated by the leading workers as well as novices from nearly all the neighbouring photographic societies who had been invited by the Camera Club to be present. Mr. Hinton illustrated his lecture with a number of exquisite examples of landscape photography of his own production, almost all of which are winners of medals at the leading exhibitions, and two large wash drawings illustrating compositions and chiaroscuros, and at the conclusion of the lecture exhibited a number of lantern slides from his own works. Previous to the lecture, Mr. Hinton and Mr. Thomas (Chairman of the Affiliation of Photographic Societies) were entertained at dinner by the Committee of the Leeds Camera Club, Major Norwood in the chair. The Annual General Meeting was held on Wednesday, the 28th ult., when the following Officers and Committee were elected:—*President and Lanternist:* Mr. Robert Bourke.—*Vice-Presidents:* Major Norwood, Rev. J. Beanland, Dr. J. T. Thresh, M.A., Mr. S. Barnes, Mr. A. Homburg.—*Committee:* Messrs. Rust, Vevers, Dixon Emmott, Fox, Morfitt, and Elliff.—*Treasurer:* Mr. T. R. Thompson.—*Secretaries:* Messrs. W. R. Irwin and H. Stockwell. The names of Councillor J. Green-Hirst (retiring President) and W. A. M. Brown (retiring Vice-President) were added to the list of patrons.

Liverpool Amateur Photographic Society.—April 29, under the chairmanship of the President (Dr. J. W. Ellis).—Seven new members were elected. Mr. F. K. Glazebrook delivered a lecture, entitled

Peasant Life in the Burmese Oberland,

illustrated by 150 lantern slides. The lecture was the outcome of a number of visits and a considerable time spent in the country, and showed an intimate knowledge on the part of the lecturer of the customs and manners of the people. A number of very naturalisti coloured cloud effects were interspersed with the other slides, and attracted considerable attention.

Wakefield Photographic Society.—April 30, the Annual General Meeting of this Society was held in the Church Institution, the President (Rev. Aspinall Addison) in the chair.—Mr. Wilkinson read the report, which stated that the number of members was fifty, twelve new members having joined. There had been no resignations. There had been ten lectures and demonstrations, and an exhibition of members' lantern slides. The meetings, both ordinary and committee, had been well attended. The balance-sheet was not yet made out, but, after expenses had been paid, there would be 5*l.* 11*s.* 5*d.* in hand. All the subscriptions were not in. The President, in moving the adoption of the report, congratulated the Society on their success, and on the position the members had won for themselves. In resigning his office of President, he had the pleasant experience of leaving his successor a post of honour, and he trusted he would fill that post with the same pleasure as he, the speaker, had always done. He had been President longer than was usual, and had been pressed to accept the office again, but he felt that the honour ought to be passed round. He wished them all success, individually and collectively. Continuing, the Chairman said that, as the outgoing President, it was his pleasing duty to propose their Secretary as President. He wished to thank Mr. Wilkinson for his work as Secretary during the past year. It would not have done to lose such an excellent Secretary, so they had decided to ask, and he had consented to fill, both offices. Mr. Wilkinson was fully deserving of any honour the Society could confer upon him for all he had done. Mr. A. W. Stanfield said he had great pleasure in seconding the motion. They all knew what an indefatigable Secretary Mr. Wilkinson was. He was most efficient, and it would be a great mistake to let him give up the Secretaryship. The joint offices of President and Secretary were not incompatible, and, with Mr. Wilkinson filling those places, they could always rely on the duties of both offices being fulfilled in an eminently satisfactory manner.—Carried. Mr. Wilkinson thanked the meeting for the honour they had done him, saying that, as a Secretary, he did not fear any one, but, as a President, he was a bit nervous. Major Norwood proposed as Vice-Presidents Rev. A. Addison and Mr. H. M. Briggs. Mr. Holmes seconded, and it was carried unanimously. Mr. H. M. Briggs proposed that the following form the Committee: Mr. A. W. Stanfield, Major Norwood, Messrs. W. Holmes, J. Shaw, C. Miles, R. Hobson, J. H. Chaplin, and W. T. Wilkinson, Secretary, with Mr. G. H. Roberts, Treasurer. Mr. Cass seconded, and the motion was carried unanimously. Mr. A. W. Stanfield then proposed a vote of thanks to the retiring President. He could not speak in too high terms of the services Mr. Addison had rendered the Society. He had always attended the meetings and conducted them in an able manner. As President of that Society, Mr. Addison had made many warm personal friends. He (Mr. Stanfield) would have liked to see Mr. Addison perpetual President, but, of course, that could not be. He felt very grieved when he resigned, and the Society had many things to thank him for during the three years he had been in office; for one thing, for allowing them to have their meetings at his house, which was at the same time pleasanter and more economical. It was a difficult thing to say all he would have liked to say with Mr. Addison present, so he would propose that they thank him heartily for his able and genial Presidency. Mr. Briggs seconded the motion, thoroughly endorsing all Mr. Stanfield had said, and it was carried with acclamation. Mr. Addison, in acknowledging the vote, said the best thanks that could be accorded him was the increase and success of the Society.

FORTHCOMING EXHIBITION.

1897.
December 9–11 .....*Aintree Photographic Society.
* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CONVENTION.

To the EDITORS.

GENTLEMEN,—I have the pleasure to inform you that the Photographic Convention of the United Kingdom will this year be held in the week commencing Monday, July 12, at Great Yarmouth, under the presidency of Mr. F. P. Cembrano.

The spacious and elegant Town Hall of Great Yarmouth, in which the meetings and Exhibition will be held, has been retained for the use of Conventioners during the week, and the comfort of members attending the Convention will be studied in every way by the Reception Committee, the executive branch of which, with Mr. H. Harvey George, The Tower, Gorleston, Great Yarmouth, as Local Honorary Secretary, are making great efforts to ensure that the Convention at Great Yarmouth shall be as successful a gathering as any preceding Convention.

The Council is arranging for some very important papers and demonstrations to be given in the evenings during the week, and it is probable that a fine collection of photographs illustrating East Anglian scenery will be on view, besides an exhibition of everything that is up to date in apparatus in use in photography, as well as the productions of the leading trade exhibitors of this country.

The excursion arrangements by road, rail, river, Broad, and sea, promise to be particularly attractive, and Conventioners thus will have unusual facilities for visiting the choicest districts of East Anglia.—I am, yours, &c., R. P. DRAGE, *Hon. Secretary.*

95, Blenheim-crescent, London, W.

PRICES AND THE ASSOCIATION OF MANUFACTURERS.

To the EDITORS.

GENTLEMEN,—I should imagine that the remarks contained in the letters of "Photographer," "T. M," and an "An Old Freetrader," must be echoed by all professional photographers. I have received during the past fortnight several circulars from British and foreign firms, offering goods said to be quite equal to those supplied by the "Ring" at much more advantageous terms. I consider the members of the Association are cutting their own throats in this case, as it is on occasions of this kind that the foreigner steps in, supplies goods of equal quality at a reduced price, and forms business connexions that are not easily taken away from him. Yet we complain of the numerous goods "made in Germany," and which are now on the photographic market. If a still further increase takes place, the reason will not be difficult to account for. I support British industries as much as possible, but object to "Rings and Corners" on principle.—I am, yours, &c.,

Scarborough, May 3, 1897. PROFESSIONAL.

To the EDITORS.

GENTLEMEN,—It would have been fairer had "Anti-Humbug" quoted "Free Lance" and myself in less ambiguous terms in last week's JOURNAL.

Every one who has spoken to me, *re* his letter, read it that I am the person running studios under assumed names at cutting prices. "Free Lance" puts a question to me which I am not bound to answer, if I could, so that "Anti-Humbug" must apply elsewhere.

I abide by what I stated: That a high-class photographer had come into our midst, has expressed his purpose of maintaining prices commensurate with his work. and to ignore touting and complimentary free sittings, and I have evidence that, so far, he has kept his word.

I made no allusion to outside London in this case. Would it not be better, if "Anti-Humbug" continued writing "cutting letters," not to do so under an "assumed name?"—I am, yours, &c., T. FALL.

9, *Baker-street, Portman-square, W.*

To the EDITORS.

GENTLEMEN,—I am a man of peace, but *not* at any price, and, though fifteen firms have introduced what I consider a wrong system, yet I would respectfully ask them to reconsider and withdraw the terms issued, and not make the gulf wider between them and the photographer.—I am, yours, &c., R. D.

To the EDITORS.

GENTLEMEN,—Having had many inquiries on the subject, will you kindly permit us to state that we are not in any way connected with the recently formed association of plate and paper-makers.—We are, yours, &c., BERGER & Co.

Southill park, N.W., May 4, 1897.

[The precise position of our professional friends in regard to the discounts allowed under the Association of Manufacturers' regulations will be understood by reference to the annexed.

"Rules of the Association for the sale of photographic plates, paper and films in the United Kingdom: They shall be sold only—(1) In original unopened packages. (2) *Retail*, not *under manufacturers' published list prices.* (3) To *professional photographers*, with *not more* than the following discounts: Plates and films (rollable films are excepted from these rules)—2*l.* worth per month, 5 per cent. 5*l.* worth per month, 7½ per cent. 10*l.* worth per month, 10 per cent., with 5 per cent. extra if account is paid on or before the last day of following month. Printing-out and bromide paper—1 quire of printing-out paper (or its equivalent value in cut sheets or bromide paper) and upwards, *not more than* 10 per cent."

We have received many other letters on this subject from professional photographers, but, as they are practically repetitions of those already published, it is needless to continue the correspondence, which we here terminate. We should be exceedingly pleased to know that the expressions of opinion made public in these columns had induced the Association to place the professional photographer, and especially the very small consumer, on a more favourable footing than he at present occupies.—ED.]

THE PHYSICAL DEVELOPMENT OF GELATINE PLATES.

To the EDITORS.

GENTLEMEN,—Referring to the formula for this purpose appearing under Foreign News and Notes in your issue of April 23 (page 264), I shall be obliged if some of your readers will give their experience with it. I have tried it with pyro-soda developed negatives, which have been allowed to dry before intensification, and have absolutely failed to obtain any increase of density. As reducing agents I have used pyro, hydroquinone, amidol, and pyro-hydroquinone in different quantities without success, although the solution has been allowed to act for over a quarter of an hour, and the quantity of bromide of potassium largely increased. An increase in the quantity of nitrate of silver does not improve matters. It is simply precipitated on adding the reducing agent in the form of a fine powder, which is, doubtless, metallic silver, but no deposit appears to take place in or on the film.

The importance of obtaining a reliable silver intensifier must be my excuse for troubling you.—I am, yours, &c., EPSILON.

VERY ANIMATED PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Instigated by a paragraph on page 277 of your last issue, from the pen of your friend "Cosmos," I have taken a peep into futurity, and I see that, if Article 3 of the Paul Prospectus is to be a success, the phonograph must be added, or otherwise the "fin-de-cycle" people must study the lost art of pantomime, or many "facta" will be unintelligible without the "verba."

I cannot see how original animations of individuals can be photographed, so that, for the purpose of reproduction, there must be an encore performance in the "erected" studio. This will be funny. May I suggest something like the following:—

We will call it a "word fable," and start with the moral to be taught, "A nice present turneth away wrath." Accessories being for the purpose expensive, we must go back to "old play" days, and, on a white background, stick up, "This is an Entrance Hall" and "Here is a Dutch Clock." N.B.—The Old Dutch appears in the Second Scene.

Mr. Thawey-Blue's studio; limelight up; film in position. "Clear!" "Beginners, please!" "Go!" and away goes the clicking of animatophonographs. Enter a gentleman. He walks on tiptoe, stops, pauses, seems to listen, goes on again, stops, takes out his watch (this brings him to the other end of the platform), turns round, looks towards camera, closes one eye slowly, puts his finger to the O.P. side of his nose, and says, "It's all right. Not a sound. The Ancient Hollander slumbers." He takes off his boots, ties the laces together and slings them round his neck; his hat still on his head, he goes down on his knees, moves his hands alternately up and down, and hops on one knee and then on the other (this is indicative of crawling upstairs). End of Act 1.

Act 2. "This a bedroom." The Lady of the House fully dressed, and in an expectant attitude. Enter the gentleman on his hands and knees. "Well, sir." "Holloa, my dear! still up?" "Yes, sir; what is the meaning of this?" "Well, my dear, you see, it was like this. I met my two friends, Mr. Mattress and Mr. Bricks, and they would take me round to that Photographic Society you belong to, and there was a clever person named Mr. Blucher read a paper, and then we had to sample some new developers. Mr. Countem produced a new one. It was:—'Spiritus Hibernicus, one part; aqua sodium, two parts; restrainer,

common sense.'" All this time he is dodging a useful and metallic piece of domestic furniture that should be recumbent in the fender, and also making frantic dives at his pocket. The lady answers that "he ought to have told her, and then she could have "handed round" some of her latest work with the new "housemaid lens."

At last the parcel is produced and laid at her feet, with the words, "Yes, I know; but see what I have brought for your next outing." Wrath is changed to joy, and the lady exclaims, "Oh, you dear boy! it's three dozen backed plates made by ——"

But Westboy's film does not run interminable lengths, and so the action is stopped, and the editor, in his strict impartiality, knocks over the phonograph, and this all-too-apparent attempt at a free advertisement is lost for ever.—I am, yours, &c., A. C. PARACHUTE.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Samuel Powell, High-street Studio, Rushden, R.S.O.—*Three photographs of the Rev. J. G. Davies.*

Franklyn Davey & Co., Bristol.—*Photograph of Mrs. Sarah Thomas, of Burry Port, Carmarthenshire.*

Gordon M. Ambrose, High-street, Burnham-on-Crouch.—*Photograph of the yacht "Penguin," sailing.*

Geo. Ernest Ward, 240, Alfreton-road, Nottingham.—*Photograph of design, with space left for inserting any photograph.*

E. S.—A knowledge of wet-collodion work is practically indispensable; you would stand a much greater chance of success if you could supplement it by an acquaintance with block etching.

PLATINOTYPE.—W. H. W. The trouble is caused by the paper having been allowed to absorb moisture. It is no use drying it now, as the mischief has been done and the paper spoilt. In future keep it safely in the chloride of calcium tube.

A. HUNT.—Mercury bichloride is scheduled in the Poisons Act, so that, although photographic dealers do sell mercuric intensifiers apparently without interference from the Pharmaceutical Society, they, possibly, run the risk of prosecution.

GELATINO-BROMIDE PAPER.—S. MC. V. It is quite what might have been expected, the gelatine has dissolved. Albumen prints may be washed in hot water; so may collodion, but not gelatine, because that is soluble in hot water, while the others are not.

LACK OF DENSITY.—T. W. J. Your trouble will, doubtless, be avoided if you discontinue the use of rapid plates for the work, and substitute slow ones, such as are sold for photo-mechanical purposes. Rapid plates are very unsuitable for copying engravings.

STEREOSCOPIC CAMERA.—T. BLISS. Four inches apart will not be too much when taking distant objects, but for very near ones it is more than is to be recommended, as then, when the pictures are viewed in the stereoscope, the relief will appear too great.

CARBON PRINTING.—ALPHA. The answer given is simply absurd. It is pretty clear that your letter was replied to by a clerk who has no practical acquaintance with the work. Write to the firm again. There should be do difficulty about the matter.

LENS.—HERTFORDSHIRE NOVICE. If the lens be symmetrical, it will make no difference which combination is used as a single lens for landscape work. Bear in mind that, whichever is used, the convex side of it must be next the ground glass, and that a small stop must be employed.

PHOTO-LITHOGRAPHY.—A. C. WEBB. Although a formula for the transfer ink is given in the work, we should recommend you to purchase it rather than attempt to make it yourself, as it is a very messy job. Moreover, the ink, when made in small quantities, is rarely so good as that which can be purchased.

SALE OR RETURN.—J. A. As the prints were not ordered by you, but sent on sale or return, and you have sold none, simply return them. It is no use expecting you to pay for the prints because they have faded while in your possession. Let the people take their threatened proceedings; but we know they will not.

SPOTS.—R. W. There is very little doubt that the greater part of the spots are caused by particles of bronze powder with which the mounts are printed, and which are to be seen on different parts of the card. The bronze, however, must not be charged with the yellow stains, they are due to careless work—imperfect fixation.

RENOVATING CAMERA.—J. COX. The best way, from what you say, would be to have the camera French-polished afresh. Failing that, thoroughly wash off all the dirt with warm water and soap, then use any of the well-known commercial furniture polishes or revivers, applied according to the directions supplied with them. To make the work look well, it is imperative that all dirt must be completely removed before the polish is applied.

REVERSED PLATE.—W. BURTON asks: "Can you explain why the negative from which the enclosed print was made is reversed? You will notice that the words on the poster read backwards. I may mention that the negative took a long time in development. A friend of mine had a similar experience not long ago."—The reason of the reversal is that the plate was put the wrong way in the slide, the glass side towards the lens.

COPYRIGHT.—R. BACKLEY. Yes, certainly; you can secure a copyright in your reproduction of the century-old map of the town. But that will not prevent any one else from producing similar reproductions from the same original. You are quite under a misapprehension in surmising, because yours is the first photograph that has been taken of the original, that, by registering it, you can prevent other photographs of it being taken.

COATED PRINTS.—R. ROBERTSON asks the following question: "Would not coating gelatine prints with collodion, by protecting them from the atmosphere, prevent them from fading?"—No, not if they contain within themselves the elements of decay, which is usually the case when they do fade. In some comparative experiments, made many years ago with albumen prints, it was found that those coated with collodion faded quicker than did others which were not coated.

LENS.—W. WILSON. From the description we know the lens quite well. It is not a triplet, or what is known as "the triplet lens," but a portrait lens with two supplementary lenses, one to shorten the focus of the combination, and the other to lengthen it, so that it would, in the latter case, cover a larger plate. That form of instrument was introduced many years ago by Derogy, of Paris, but it did not meet with a very ready sale in this country, notwithstanding its convenience.

PARAFFIN LAMP.—J. B. W. writes: "I use an enlarging lantern with a three-wick lamp, and, so far as the light is concerned, there is nothing to complain of, but the fume from it is abominable. Can anything be done to remedy that?"—In most instances the unpleasant fumes are due to want of care. Ill-trimmed wicks and dirty wick-holders are the most general cause of the lamps smelling. See that the wick is evenly trimmed, and that the outside of the lamp is carefully wiped each time before it is lighted.

VALUE OF BUSINESS.—TIRED OF IT writes: "Can you tell me the value of the goodwill of a business I want to sell? The takings are small, but the apparatus is all good, and the studio in fair repair. The average net profits of the last three years, I doing all the work myself, have been eighty pounds a year. The studio belongs to the landlord."—We do not see that the goodwill is worth anything, seeing that the net profits are far less than the vendor would receive as an operator, if he is a fairly good worker. We should say that the apparatus and fittings at valuation is all that can be expected.

RENOVATING CAMERAS.—W. H. says: "I have got some furniture polish and applied it to my studio cameras; it has put an excellent polish upon them, but in the corners it is black, and, although there is a good polish on, the cameras look really worse than before. Can I remedy this?"—The fault is that the wood was not freed from the dirt before the polish was applied, and that has been polished over. The directions on the bottle, no doubt, said, Clean off all dirt before the polish is applied. The only thing is to remove the polish and clean off the dirt; but, as we do not know the composition of the polish, we cannot say how that can be done.

TILTED CAMERA.—OXON says: "I have just got one of the new German lenses, and send you herewith prints from the only two negatives I have taken with it—the interior of our church. I was told these lenses gave pictures free from distortion, but you will see that all the perpendiculars converge. As I had the lens direct from the inventor, what shall I do, as the English law does not apply to Germany?"—Do not worry yourself. The lens is all right; the fault is yours. You have tilted the camera to get in the upper part of the building, and have not brought the swing back, supposing the camera is provided with one, into use. That is all that is the matter. All lenses, of course, would behave similarly under like conditions.

WRONGLY MARKED STOPS.—XYLO writes: "The other day I took the trouble to verify the apertures of the stops of my two lenses, which are numbered according to the Society's standard, and they are all smaller than they purport to be. In one case that marked 8 is just 9, and in the others still less. The lenses have the name of ——, but I presume they are of foreign make. Is this the case with all foreign lenses made for the English market?"—No; though it is often the case. It sometimes arises in this way: the stops are all made to one gauge, but the lenses, when finished, are not all of exactly the same focus, some being a little longer or shorter than others. Some of the cheaper ones, however, have the stops purposely marked larger than they really are.

COPYRIGHT.—COPYRIGHT says: "A firm of printers have brought out a directory, having in it several reproductions of local views. They have taken the liberty of using one of my views of one of the churches, and printed at the bottom of page, 'Lent by So-and-So,' mentioning the name of some one that let them have the photograph. Kindly tell me if I joined the Copyright Union, and had the photograph registered, would they take up the matter for me? There was no name on the mount the photograph was on. It was one I took for nothing for the minister of the church, and have never sold or attempted to sell, it, but presented it on a plain mount."—You are powerless until the photograph is registered. In the circumstances mentioned, it is doubtful whether, even if you registered the photograph now, you could recover The address of the Photographic Copyright Union is Botolph House Eastcheap, E.C.

*** Several answers to correspondents unavoidably held over.

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EX CATHEDRÂ.

To the May number of our always instructive and interesting contemporary, the *Strand Magazine*, Mr. R. Francis Nesbit, the son of our old friend, Mr. John Nesbit, so well esteemed by many photographers, contributes an illustrated article, entitled, "How a Snake Swallows." It appears that Dasypeltis scabra, a small snake distributed throughout Africa, feeds exclusively on eggs. The specimen photographed measured about twenty inches long, the normal girth of the throat was one inch, and the actual diameter of the œsophagus less than that of a small pea. Yet, says Mr. Nesbit, the creature is capable of swallowing an egg fully three inches in circumference, a feat it has long been the desire of scientists to illustrate by means of photography.

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Mr. Nesbit's excellent photographs, obtained after many unsuccessful attempts, show the entire performance in its various stages. The gradual forcing of the egg into the snake's extended jaws and its passage down the neck are vividly depicted. The snake, it appears, ingeniously abstracts the contents of the egg, and ejects the shell in the shape of a pellet. The entire process occupied about twenty-five minutes. The operation, as Mr. Nesbit says, is a very wonderful one, and once more proves the value of photography in special cases. It would appear that Mr. Nesbit has a considerable affection for snakes. We are unable to join him in his interesting regard for the reptiles, but we hope he will take and reproduce many more photographs as clever and valuable as those to which we have referred.

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Members of the Royal Photographic Society do not appear to take much interest in the selection of Judges for the annual Exhibition of the Society. Last week the balloting paper for the election of the gentlemen who are to officiate next September was sent round to members. Only five gentlemen took the trouble to make nominations, and, of the five, three are non-exhibitors. The interest taken by members in the Exhibition is, as a rule, so keen, that this apathy with regard to the nomination of the Judges is inexplicable.

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The excursion arrangements of the forthcoming meeting of the Photographic Convention are as follows:—

Monday, July 12.—Opening of the Convention. Reception by the Mayor in the Town Hall, at 7.30 p.m., followed by the Presidential Address and Exhibition of lantern slides.

Tuesday, July 13.—Excursions by river and rail to Norwich and to Lowestoft.

Wednesday, July 14.—Excursions to Caister Castle, various places of interest in the borough; the taking of the Annual Convention Photographic Group; the Annual General Meeting, followed by the Annual Dinner.

Thursday, July 15.—Excursions by river to Wroxham, and by rail to Blickling Hall.

Friday, July 16.—Excursions by rail or water to Oulton Broad, and by rail to Swaffham for Castleacre.

Saturday, July 17.—Excursion to Ipswich.

Fuller particulars will, of course, appear in the official handbook.

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The case of Lazarus *versus* The Artistic Photograph Company, involving the point of the obstruction of light of a studio, was recently tried before Mr. Justice Kekewich. It appeared that the plaintiff was the owner of a photographic studio in Oxford-street, to which the access of light had been obstructed

by the erection of another studio by the defendant Company. The defendants had attempted to remedy the interference with the plaintiff's light caused by the new building by painting the latter red, so as to reflect a better light. The evidence adduced showed that the light of the plaintiff's studio had been so interfered with as to render it useless for the purposes of the plaintiff's photographic business, and the attempted remedy did not, in fact, improve the light required for photography. It was also proved that the plaintiff had only used his studio for photography for the last ten years, and that previously thereto the premises had been used as a store room or for other similar purposes. This was a motion by the plaintiff to restrain the defendants from erecting any building or permitting any building to remain erected so as to interfere with the access of light to the plaintiff's studio. Counsel for the defendents argued that, as the plaintiff claimed to enjoy a light peculiarly suitable for the purposes of photography, he must show that he had enjoyed that special light for the period of twenty years.

* * *

The Judge, after referring to the case of the Attorney-General *versus* The Queen Anne and Gardens Mansions, Limited, which was decided by his Lordship, refused to come to any conclusion inconsistent with his former considered judgment, and decided that it was not necessary that the light required by the plaintiff for the purposes of his photography should have been enjoyed by him for twenty years. His Lordship set aside the question of the reflected light as not being material to the point at issue, and came to the conclusion that the interference with the plaintiff's light was such as to necessitate a mandatory injunction, which his Lordship accordingly granted.

* * *

Our leading article this week is devoted to a brief survey of the very interesting photographic branch of the Imperial Victorian Exhibition, opened by H.R.H. Princess Christian at the Crystal Palace on Thursday, May 6. We quote the following reference to the photographic section, which appears in the detailed particulars compiled for the use of representatives of the press: "The photographic section begins from the Daguerreotype and terminates with the Röntgen rays. During the Queen's reign the picture-makers have more than kept pace with the sun, and all the while the beautiful glass fountain, made by Messrs. Osler forty-six years ago for the Hyde Park Crystal Palace, catches the rays of the god of light with the same imperturbable brilliancy. Few would believe that this lovely structure in the tree-fern pond weighs over four tons. The crystal fountain has never been equalled, and yet often unsuccessfully copied." It is not easy to detect the connexion between photography and a glass fountain, and the statement that the picture-makers have kept pace with the sun is a delightful fantasy. But we, nevertheless, congratulate the Palace authorities on the entire Exhibition, which is highly attractive and instructive.

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Mr. W. W. Watts, the Hon. Secretary of the Geological Photographs Committee of the British Association has contributed to the *Geological Magazine* a valuable paper, entitled "Notes on British Geological Photographs," from which, in another part of the Journal, we make several extracts that will, doubtless, prove interesting to those anxious to assist in the labours of the Committee in forming a collection of geological photographs of the British isles. Mr. Watts, whose address is 28, Jermyn-street, S.W., states that, as the meeting of the British Association takes place this year, in August, at Toronto, it will be necessary that photographs intended to be included in this year's report should be in his hands not later than June 5. Those received later will be acknowledged in the report of the following year.

* * *

Levi, Jones, & Company is the title of a new Company, the prospectus of which is in circulation, and is issued in this week's Journal. The share capital is 20,000*l*., divided into 15,000 cumulative preference shares of 1*l*. each, to be entitled to a dividend of five and a half per cent. per annum, and 5000 ordinary shares of 1*l*. each. The present issue is of 11,000 preference shares of 1*l*. each, 4000 being held in reserve.

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The Company has been formed for the purpose of taking over and carrying on the business of S. J. Levi & Co. (S. J. Levi & A. J. Jones), wholesale opticians and manufacturers of photographic cameras, optical lanterns, leather cases, and accessories, at 71, Farringdon-road, London, E.C. The business has been carried on for upwards of seven years, and it is stated that the profit-bearing returns and prospects have steadily increased and improved, and that the connexion is a most extensive and valuable one, nearly every dealer and all the leading houses in the photographic and optical business having an account with the firm. The Company will retain the services of Mr. Levi and Mr. Jones as managing directors.

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The prospectus states that during the three years ending Christmas, 1896, the returns of the business were three and a half times the amount of the capital employed, and it is added that, for obvious trade reasons, no detailed statement is given of the inner working of the business. But it may be stated that the resulting profits show ample margin for the payment of the dividends on the preference shares, and the only profit the directors can receive is after this dividend has been paid. The vendors state that they are doing a rapidly increasing trade, the full advantage of which can only be secured by the addition of further capital. The subscription list opened at ten a.m. on Thursday last, and the Company will proceed to allotment on Monday next.

* * *

Mr. C. T. Appleby, the Managing Director of the Photo-Enamel Company informs us that the difficulties of producing a photographic film that can be fused at a high temperature on enamelled iron or other metal surfaces, tiles, plaques, &c., have been successfully overcome, and that his Company are now in a position to execute orders for work of this kind, either as art reproductions or for advertising purposes. At present, sizes up to 20 or 22 × 16 inches are undertaken.

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Several specimens produced by the process were submitted to us for inspection. They were of extremely good quality, and the adaptability of the process for advertisement plaques and for photographic pictures of a higher artistic character suitable for framing, for placing on walls and domestic decoration, is undoubted. There is considerable scope for enamelled photo-

graphs fused on iron and allied surfaces, and we understand that the Company intend working their process on a large scale, catering, not merely for large advertisers, but also for photographers and others supplying their own negatives for reproduction in this manner.

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With reference to our remarks last week on the subject of the Plate-makers' Association's discounts to professional photographers, Messrs. Cadett & Neall ask us to state that, since their establishment in 1892, they have had one set of discounts, to which they have consistently adhered, and, since the formation of the Plate and Paper Manufacturers' Association, the discounts agreed to by the Association are larger than those hitherto given or sanctioned by Messrs. Cadett & Neall.

THE PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

The Imperial Victorian Loan Exhibition was opened on Thursday last week by H.R.H. the Princess Christian. The object of this Exhibition, as set forth in the prospectus, is to illustrate the progress made in the arts, sciences, and manufactures during the sixty years of the Queen's reign—1837–1897. Photography, of course, is an important item, inasmuch as it —that is, practical photography—was born, reared, and has, with its multitudinous modifications and applications, developed to its present important entirety since the Queen ascended the throne. It was in 1839 that Daguerre, a Frenchman, and our own countryman, the late Mr. Henry Fox Talbot, gave almost simultaneously to the world practical photography. On January 7 Daguerre's discovery was communicated to the French Academy of Sciences, while Fox Talbot's discovery was communicated to our Royal Society on the 30th of the same month.

On visiting the Crystal Palace on the opening day, we found things in anything but a finished state; some parts, indeed seemed to be in almost a chaotic condition, as such exhibitions usually are at the opening. That is scarcely to be wondered at in the present instance, seeing that the date of opening, at short notice, was made nearly three weeks earlier than that originally fixed upon. On making our way to the Photographic Section, to which the Renaissance Court has been allotted, we were pleased to find things very different; indeed, this section was far more advanced than any other we visited. The walls and screens were well covered, and the cases filled with objects of high historical interest, from the earliest period up to the latest date. Messrs. Negretti & Zambra, to whom the organization of this section has been entrusted, and Mr. E. W. Foxlee, who has assisted them in the work, are to be congratulated on its present completeness.

On entering the Court—after passing Mr. Dallmeyer's very interesting case, in which are shown the progressive stages of advance in English photographic lenses, from the earliest of his grandfather's, the late Mr. Andrew Ross, up to the latest Stigmatic—two very striking objects meet the eye. One is the largest portrait in the world, taken direct, measuring 65 × 38, lent by the producer, Mr. Alfred Werner, of Dublin; the other a fine enlargement, on bromide paper, about the same size, by Messrs. Morgan & Kidd; also some fine carbon enlargements, by Messrs. Eyre & Spottiswoode (Woodburytype Company), and by Messrs. Thomas Illingworth & Co.; and of architectural subjects by Messrs. Bulbeck & Co., and of animals by Mr. Thomas Fall.

In the cases are to be seen one of the finest collections of Daguerreotypes ever got together. There is a portrait that was taken in 1840, before bromine as an accelerator was discovered, and before Fizeau's method of gilding, or toning, the image was introduced. There are also instantaneous Daguerreotypes, one of New York Harbour, taken later on, lent, amongst others, by Mr. L. W. England, in which the frame of the paddle wheels of a steamer, and the waves, are as sharp as in modern work, as well as an excellent picture of Daguerre himself. Here very early glass positives are shown which fully illustrate what that process is capable of in the hands of skilled workers. In one of the cases are also some of the earliest paper photographs taken—an album, for instance, dated 1839–1851, containing amongst others a print from the first glass negatives (albumen) taken, also an original letter from Sir David Brewster relating to the albumen process.

In the Court are examples of paper negatives made in the "forties," as well as negatives by other processes, including albumen, collodio-albumen (lent by Mr. James Mudd), wet collodion, &c. A frame of prints from negatives by the first *dry*-collodion process (Mr. Robert Freeman Barnes, 1855) are quite up to the standard of modern work. Mr. Walter Pouncy has lent some of his late father's early carbon work, without transfer (1859), as well as some of his later results by other methods, while Mr. J. A. Sinclair shows some excellent results by the Artigue method. Mr. J. W. Swan lends some of his early work, by double transfer, and the original model of his tissue-making machine. Photo-lithographs and half-tone, by Pouncy (1859), and by Bullock Bros. (1866), compare very favourably with those produced at the present time. The flight of bullets and the effects of shot on armour plate are illustrated by photographs lent by Professor Boys and the War Office.

Astronomical and meteorological photography is illustrated by photographs lent by Sir Howard Grubb, the Royal Meteorological Society, and the Kew Observatories and others. The process of photogravure is illustrated by some of Fox Talbot's early work, some of Paul Pretsch's, and others, including Mr. A. E. Smith's *Choosing the Wedding Gown*, which gained the 20*l.* prize and silver medal in the Society of Arts' competition a couple of years ago. Ceramic photographs by the substitution method, the powder process (Morgan & Kidd), gelatine method (Gay), and the collotype method (Grundy), are well represented. Modern amateurs will be not a little surprised to see what their *confrères* of thirty years ago did when they look at the fine pictures of Mr. Osmond R. Green, 24 × 18, taken direct on plates of his own preparation — collodio-bromide. These pictures also show that silver prints are not necessarily fugitive after a few years' keeping.

Of portraits of the Royal Family at different periods there are many. On one of the screens are to be seen the portraits of many of the pioneers of photography; amongst others, Daguerre, Fox Talbot, Sir John Herschel, Sir David Brewster, Becquerel, Nièpce de St. Victor, Robert Hunt, Claudet, Sayce, Bolton, Dr. Maddox, &c.

The Historical Apparatus Section is very interesting, especially to modern inventors, as many of the things shown are wonderfully like some others that have formed the subject of recent patents. A portrait in *bas relief*, it may be mentioned, pressed up from the back, is shown, which was produced something like a quarter of a century ago.

In this article we have only given a brief synopsis of what is in the Exhibition; in future ones we propose to give fuller details both of the exhibits and the methods by which they were obtained.

Scientific Photographs Wanted. — The Sixty-ninth Meeting of the German Society of Science and Arts will be held in September next in Brunswick, and in the Exhibition to be held it is intended to include one of scientific photographs, organized by Professor Max Müller. Contributions of papers and photographs are asked from all workers on the subject.

Celluloid for Accumulator Batteries.—A new form of accumulator has recently been tried at the depot of the London, Deptford, and Greenwich Tramway Company, and found to be quite satisfactory. The system is based on the use of carrying plates of celluloid enclosing the lead plates and provided with a number of openings, the edges of which form the supports for the active material in the shape of a special paste. The advantages claimed are great durability and ability to stand various strains, such as are met with in tramway work. It would seem to be just the sort of battery suitable for photographers to carry about when doing portrait work away from the studio, as, for example, engagements for balls and so forth.

Sound Photographs.—The New York correspondent of the *Standard* describes some novel "sound photographs." Any tone produced before the small end of an upright funnel originates vibrations in a sensitive horizontal membrane covering the other end. These are reproduced on a tiny dancing drop of a coloured liquid, and reflected in a mirror, before which passes a continuous film, like that of a cinematograph. Theoretically, a photograph of an opera might be made, resulting in forms curious but always symmetrical, beautiful and sometimes resembling flowers, though others take geometrical curves. This is undoubtedly interesting, but it would be so to a tenfold degree if we were informed of the details of any method of retranslating these photographs into music.

Photography as a Riddle Solver.—Some of our older readers will remember, well on towards half a century ago, the discussion as to whether the moon does really revolve on its axis, as was usually stated. This really is a scientific riddle, just about equal in calibre to the popular one, which asks whether any one can be said to go round a monkey on a pole, if, while the observer walks once round the pole, the monkey keeps twisting also, so as to keep his face to the pedestrian. Now the same puzzle is taking place about the rotation of Venus, and Herr Gümpell stated, at the last meeting of the British Astronomical Association, that it had struck him that photography might be employed to solve the question, by means, not of a continuous picture, but of impressions taken at repeated short intervals.

Aluminium for Condensers.—Most photographers who make their own distilled water are satisfied with the well-known form of condenser which Liebig made of two concentric glass tubes, with suitable connexions and fittings. Recently, however, a suggestion has been made to use aluminium for the steam tube, and, as regards purity of the resulting distillate, it bears close comparison with glass, with the distinct advantage of being able to be used with a shorter length of tube on account of the high conductive power of this metal. Mr. T. H. Norton, in the *Journal of the American Chemical Society*, describes one he has constructed and found of high efficiency. The outer jacket was of glass, the inner of aluminium, 122 cm. long, external diameter 1 cm., inner diameter 8½ mm., weight per metre 29 grammes. He tested the distillate against that from glass, and found it quite equal in purity.

Mr. Crookes on the Physiological Effect of Röntgen Rays.—Mr. Crookes, in the *Comptes Rendus* of the Paris Academy of Sciences, referring to the painful effect produced on the hands, &c., of some persons exposed to the rays, states that he is inclined to think that the very energetic action sometimes observed with these rays depends, up to a certain point, on the idiosyncrasy of the experimentalist. He himself, though, as he states, he has been exposed to the action of the rays for a longer time than most experimentalists, has experienced no effects either upon the face or hands. At the same time he points out that he has witnessed in others very marked physiological effects. Our readers who are familiar with the use of bichromate of potassium will readily understand how easy this variety of experiences could exist, seeing that one man may dabble with impunity all day long in bichromated water, while another suffers from a violent eczema if but a small quantity of such solutions is used for a short time only.

Kites for Observations in War.—We find that the suggestion we made some time ago as to the use of kites as a medium for taking photographs of the enemy's position during war time is now a realised fact. According to the *Daily Mail*, Captain Baden Powell has, by the aid of a kite, ascended a considerable distance in the air, and from there made observations. He says: "One of the most important of the uses to which a kite can be put is photography. If a camera could be suspended high in the air, so as to take a picture of what is underneath, it would be of inestimable advantage for the purposes of discovering guns in a hostile fort, also for the making maps of unknown ground." Captain Baden Powell produced a wonderfully distinct picture of a house and grounds from an altitude estimated at 400 feet, and every path, fence, and wall, was clearly shown. "At present I use a camera, the shutter of which is released by the burning of a slow match;" but he is having a clockwork arrangement made, by which he expects to be able to take half a dozen consecutive pictures at regulated intervals of time.

MIRRORS AND PRISMS.

THERE are some essential points of difference between mirrors and prisms which ought to be better understood by process workers. When the question is put as to what are the advantages of a prism compared with a mirror, the usual answer—and indeed it is the only answer possible—is that the brilliancy of its reflecting properties is never impaired; the silvering being on the back and properly protected, there is hardly any possibility of it becoming tarnished or scratched. Perhaps it would be more to the point if the question were asked, What are the respective disadvantages of the prism or the mirror? To my mind it is always more important to know the disadvantages of a thing than the advantages, for it may be taken as a philosophic axiom that any advantage gained must have some attendant drawback. How very true this is of photographic apparatus, and especially optical instruments, only needs a little consideration to be demonstrable. Seeing, then, that absolute perfection is a human impossibility, all we can do is to balance the sum of advantages with the sum of disadvantages, and accept that which turns the scale. In the case under consideration, *i.e.*, the relative merits of prisms *versus* mirrors, it is a little hard to determine if we would be precise, but, after a review of points *pro* and *con.*, the practical worker will decide by what accords best with his practical requirements.

Taking first the case of a mirror, the properties which cause it to reflect an image through a right angle are simple and easily understood. For every degree that a mirror is inclined to an incident ray of light, the reflected ray moves two degrees. Consequently, if the mirror is inclined at 45°, it reflects the object before it to an angle of 90°. It matters not whether the mirror is placed before or behind the lens at this angle of 45°, nor is it of much importance whether or not it is a fraction out of its proper angle, this only having the effect of throwing the image a little out of the centre. Any lens is adaptable to a mirror so long as the latter has a length slightly greater than the subtended angle of the lens diameter and a breadth exceeding the lens diameter. It does, however, occasionally happen that there is a suitable distance from the lens at which the mirror will work best, and often a mirror or mirror box has been condemned from ignorance of this fact. In the old-fashioned form of mirror box, now practically discarded, in which the mirror was in front of the lens,

provision was made for sliding the mirror to and from the lens. Except for this advantage, undoubtedly the modern form of mirror box, in which the mirror is behind the lens, is by far the best. The mirror is shut off from stray light, dust, and fumes, and there are no cross reflections; it is, in fact, only occupied in transmitting what the lens presents to it, and whatever angle the lens takes in so does the mirror. The question may be asked whether there is any falling off in the light transmitted by the mirror, or, in other words, does it increase the exposure. The reply is, that if the mirror is perfectly plane, its glass surface highly polished, and its silvering is perfect and free from tarnish, it will transmit ninety-five per cent. of the light. But one or more of these conditions are very likely to be at fault, and the falling off may run down to a considerable extent. Optical grinders who undertake to work plane surfaces may be counted on the fingers of one hand, so far as London is concerned, and even the best of them occasionally turn out a faulty plate. The grinding is more a matter of skill and experience than machinery, the latter being of the most primitive description, consisting only of a rotating metal disc, which is charged with fine emery and other polishing powder and water. The perfect flatness of the disc is, of course, essential; but most important of all is the ability of the operator to keep the plate in perfect contact with the disc. Even where optical flatness is secured, another fault is sometimes overlooked or ignored, viz., imperfect polishing out of little pits in the surface. This upsets the silvering, and, if the fault is strongly marked, scattered reflection is produced, and as a result foggy images and loss of light. Of course, so long as these faults are not very palpable, we can afford to overlook them; they are merely mentioned here to indicate how to look for ultra-perfection in a mirror. If this were insisted upon, photographic mirrors, instead of costing about a shilling per square inch, would cost about a sovereign per square inch, which, I believe, is somewhere about the price charged for astronomical mirrors. A photographic mirror has indeed to be very bad before it "gives out," and many are used until they are quite covered with spots, scratches, and tarnish. In London about six or eight weeks is about the average life of the silvered surface of the mirror, and in the fog season it is often immediately tarnished in a week. This tarnishing might be obviated by coating the silvered surface with a very dilute celluloid varnish, but such an operation must be done when the mirror is clean, bright, and dry.

Though many formulæ have been published for silvering mirrors, very few attempt the operation. Those few who have gone so far as to try their hand in this direction could relate, no doubt, a story of exasperating failure. It must not be forgotten, too, that there is a certain element of danger in it, as the ammonia nitrate of silver which is used forms a fulminating compound, and I heard of a case quite recently in which a Winchester of solution, which was being incautiously shaken up exploded, and nearly ruined the eyesight of the operator, who was, at any rate, laid up in the hospital for some weeks.

It has been suggested that metal mirrors would be more durable, but the objection is that it would be difficult to preserve their flatness after frequent repolishing. Moreover, the expense of a speculum mirror of the requisite size would be considerable. I have tried a brass or copper plate, silvered; but it is, in the first place, difficult to get the metal flat, and, after the buffing which follows silvering, it is worse. A black glass mirror can be used, but with considerable loss of light.

We are thus driven to the prism if we want an immunity from the troubles incidental to the silver surface of the mirror. The one thing that can be said in favour of the mirror is that it takes in an angle which, for all practical photographic purposes, is unlimited, whilst, as I shall show, prisms confine the lens to a very narrow angle. It must, however, be pointed out that the majority of work that a process operator has to deal with is of comparatively small size, and consequently confined in a narrow angle of view, so that this objection is seldom noticed.

Of course, as the limiting angle of the crown glass usually used is about 40°, it is not to be expected that we can take in any wide angle when the prism is used. It is stated, in the catalogue of an eminent Continental lens-making firm, that the angle of the lens used in conjunction with the prism is reduced to 40°. The limiting angle of the prism being measured from the normal, we presume that the statement with regard to the lens infers the angle of the cone of rays, in other words, 20° from the normal. In practice, however, it will be found possible to get in 25° or 30° from the normal by silvering the hypotenuse of the prism. We have been told that silvering a prism is like "painting the lily," but this is one of the points where theory and practice agree to differ. For strictly parallel rays it may be true enough that a right-angle prism is the most perfect reflector known, but, as soon as the rays deviate from the perpendicular, a loss ensues, and increases as the angle is widened. By silvering the back we compensate for loss by reflection at the incident surface, and by scattered reflection and absorption internally. Even in sextants and suchlike instruments it has been found an advantage to silver the hypotenuse of the prism. I believe, moreover, that it can be mathematically proved that, by reason of the prism being silvered, we can go beyond the critical angle, the silvered surface exerting its effect as a mirror when the ray has gone beyond the boundary of total reflection from glass. In any case, if the prism is not silvered, it will be found that a prismatic band runs down one side of the ground glass, and this results in a corresponding patch of fog down the side of the negative, so that the question of silvering or non-silvering need not be argued any further.

Coming back to the question of angle, it may be stated that, so long as the prism fairly exceeds at its non-reflecting surfaces the diameter of the front lens, and is placed as near as possible to the front lens, no difficulty is experienced, as a rule, in getting it to work with R.R. lenses of any make, although I have sometimes found that there is one distance better than another between the surfaces of lens and prism, something analogous to flare resulting at one distance which disappears at another. For this I have not not been able to discover a rule. The sharpness of the image, when the prism is used, seems in no way to suffer when prism and lens are in proper adjustment, so far as my experience goes, though I have heard it asserted that there is a loss compared with using the lens direct. Cases have been brought under my notice in which both a prism and a mirror, respectively on the same lens, failed to render horizontal and vertical lines, although the lens was free from such astigmatism when used direct. Why either a prism or a mirror should produce astigmatism is a problem I have not been able to work out, nor can I say that this fault is common, though in regard to a certain lens of first-class make, two different mirrors known to be correctly worked and adjusted made the lens equally exhibit the same fault when it did not show it without the mirror. These are little troubles which have cropped up occasionally; and, as a general rule, the fitting of prisms to narrow-angle lenses occasions no difficulty.

But take one of the modern anastigmat lenses and try to adapt a prism. Then the trouble begins. Of course, it will at once be said that the reason is that the angle of the lens exceeds the limiting angle of the prism, but further consideration leads one to reflect that, as the prism is placed in front of the lens, the only difference made would be that the angle of the lens is cut down to the angle passed by the prism. This, however, is not the trouble, it is that the lens does not now render a sharp image at all. The lines appear double, and a sort of flare overspreads the whole. This is only true of some lenses, and, generally speaking, these are of short focus.

Other lenses of the wide-angle anastigmat type, but longer in focus, have rendered a sharp image in the centre, but with a rapid falling off to the margins.

Let it be understood that there could be no question of the prism box being at fault, nor of the quality of the glass or the accuracy of the prism surfaces and angles, as methods were adopted to determine correctness in these respects. The glass can be tested for striation by means of the polariscope, whilst the angles can be accurately determined with the goniometer. Nor could the difficulty be in the size of the prism, for much larger sizes than the one suitable for the lens were tried with equally ill success. A trial of the prism behind the lens had no better result. It has been suggested that perhaps the glass was not of a suitable index of refraction to accord with the index of refraction of the glass of the lens. But, whilst this seems a plausible argument at first sight, it becomes almost absurd on closer consideration, when we know that modern lenses are combinations of glass of varied refractive index. Moreover, the choice of glass suitable for prisms is not a wide one, and the differences in their refractive indices are only to the extent of a place of decimals. Crown glass only is suitable, and Chance's hard crown is stated to be 1·5179 in its refractive index for the D line of the spectrum, whilst the ordinary silicate crown of Jena is 1·5175, and the boro-silicate crown, which is one of the new kinds of glass suitable for prisms introduced by the Jena Works, is 1·5100. This latter glass is of exceptionally great mechanical hardness and very free from colour, but it cannot be made free from bubbles, whilst its cost rather puts it out of the market.

Are we, then, to take the statement for granted that wide-angle lenses will not work with prisms, or is there some overlooked solution for the difficulty? This is a problem that I should like to see some of our optical experts take up. It has occurred to me that the curvature of the lens may have a good deal to do with the difficulty, causing the rays from the prism to strike the lens surface too obliquely to be properly transmitted.

These, however, are matters which concern more particularly the manufacturer. They are unnoticed by the operator, who, with a good prism perfectly adjusted to his lens, will find things "work like a charm," and, when he remembers the hair-raising troubles of the mirror, it will take a lot to persuade him that the mirror has any advantages.

WILLIAM GAMBLE.

SOME SPRING RESOLUTIONS.

THE commencement of each succeeding year is the time of good resolutions, and therefore now is the sowing season for the photographic crop. The fact that they are generally brought into existence by our own previous mistakes and misfortunes suggests that we should look back on the previous year's work, and consider it quietly and unprejudicially now that six months' lapse has brought everything into more equal focus. What were the characteristics of our photography in 1896?

Firstly, there was the usual "stock" outcry as to our share in the word "artist" and its applicability to our work. This is a strange mania, which afflicts some of our prominent workers—or writers, and which seems a continual red rag to them; and the strangest part of it is that the men whom they aspire to walk arm in arm with know little and care less for the word. A worker in oil colours modestly calls himself a painter, and Harry Furmiss's little son some time ago settled that his father and the like were "black-and-white" men.

True it is that one of the monthly magazines some short time ago introduced us to the "black-eye artist" whose studio, in the vicinity of Bow-street forms a convenient morning dry dock to repair the damages of the previous evening's storm—true also is it that the tintype gentleman on the sands has, in many cases, annexed the word and uses it as an adjective, and the barber—or tonsorial artist—has claimed it as descriptive of either his shaving or healing faculties. But in the inner world of men who are trying to describe, through their individual media, the beauties of the universe as they see them—and I imagine that is our object also—the word is foreign. Therefore let resolution number one be to prate less about words and think more of work, and to be assured that by our work only, and not our name, shall we be judged and known.

Another characteristic of the work on last year's exhibition walls was the manifest—almost barefaced—attempt to copy, not only the subjects, but the mannerisms of certain painters. There may be no great harm in the former, but, as soon as the imitation of mannerisms of expression enter in, then the result must be bad photography and bad art—bad photography, because its methods of expression are different to those of painting, and all work should be a full utilisation of the facilities peculiar to the process; and bad art, because they are simply slavish imitations of other men's manner of seeing the subject instead of our own. A few years ago a well-known photographer, prompted, no doubt, by previous pictures of a well-known R.A., gave us some fine representations of our busy, grimy, smoky Thames, and contrived to introduce distinct individuality of his own into their expression. But, alas, since then we have had coal staiths and steam tugs and Tower Bridges—all absolute copies of the original work, and without a gleam of originality—until the things are a nightmare. Therefore another resolution I suggest is that we bar work which another man has well dealt with, unless we see the possibility of a different mode of expression prompted by a different temperament.

Another characteristic of exhibited photography, for the last few years, has been the striving after the noisy moods of nature, "against the light effects" and the like. There is no doubt that there is a great temptation in these subjects, both in their reproduction and the subsequent ready appreciation, but I think they have been just a little overdone. Nature does not always wear a veil or a frown, and shriek or moan—the world is not entirely made up of dull, dank reeds, or muddy roads—the clouds sometimes form into feather strata or cumuli, and float on the blue sky; the sun is sometimes at our left or our right, or even behind our back, instead of hiding behind a big black cloud blot, and squirting light like a water hydrant. One of the *sine-quâ-nons* to good art, in all its branches, is restraint. Could not another resolution be easily founded on this?

And then, again, we must include the perennial resolutions as to not letting the plate-maker settle the size our picture must be, or our adoption of one process of printing deciding the appearance it must bear. Whilst we have so many varied and beautiful means of expression, we surely ought to take full advantage of their characteristics in our work.

Another good resolution might reasonably be a determination not to grumble at our process, as we know it to-day. Only bad workmen quarrel with their tools, and, as long as there is dissatisfaction, there can be no good work.

We have the most comprehensive of all monochrome processes, an yet we are always crying out for the colour box. Ever since paintir was, the greatest of its followers have always delighted in getting awa from colour, on which depended their bread and butter, and resting an rejoicing in monochrome; and a great part of the best work they hav left us exists in this medium. Indeed, that portion of their colour wor also upon which their reputation rests, be it either Raphael the Italia Rembrandt the Dutchman, or Constable the Englishman, is noticeabl for its reticence of colour and its emphasis of light and shade. Whil such work has practically been done in monochrome, whilst great me still revel in the use of a simple stick of charcoal, we can surely resolv to make the best of our own monochrome process.

And the last resolution I suggest, and the best, is toleration. Ever day we may see work, both in photography and elsewhere, in which, at th first glance, we may fail to see the reason for its creation, and perhaps w straightways condemn it. Let us pay the producer the empty compli ment of being a sane man, and attempt to find out the reason for hi work. Only a short time ago I was visiting a fellow photographer, wh excelled in a certain branch of his hobby, and we were discussing anothe branch which I had elected to follow. With his want of sympathy, o course, I could not complain; but, finally, picking up a periodical, h pointed to a print, and said, "There's neither rhyme nor reason in it; it' neither fish, flesh, fowl, nor good red herring;" and, when I asked hin to at least credit the producer with having done it on purpose, he said "There's no reason in it; it's simply d——d impudence."

Then I casually explained that the print was mine, and his sense of hospitality, and the "I told you so's" of his wife, prompted apologies to me, and, I only hope, a resolution of toleration in him.

We are none of us geniuses, only simple pyro-stained-fingered men and women, and not infallible, not even the critics, and therefore mutual consideration is necessary, for, without it amongst ourselves, how can we persuade the outside public to give us theirs?

W. J. WARREN.

THREE-COLOUR PHOTOGRAPHY.

II.

AFTER having passed in review from a theoretical standpoint the necessary conditions to be fulfilled in turning out successful three-colour prints Hübl goes on to consider the actual details of practical work, and the first thing that he considers is what plate to use.

He states that collodion emulsion plates can be sensitised for any desired region of the spectrum, and that because of this they will be found often superior to gelatine plates, and that in working large sizes they will be found much more convenient and cheaper, but that the greater durability of the gelatine plate presents many advantages.

The difficulties of three-colour work are not alone in obtaining command of the requisite colour sensitiveness but—a point which has not been insisted upon before*—in obtaining negatives of absolutely the same character as absolutely true reproductions of the original, to be only be obtained by exactly proportioned admixture of the three pigments; and this cannot be obtained unless the negatives show exactly the same gradations, which cannot be obtained if for one negative a wet plate be used, for the other a dry plate, and the third a collodion emulsion plate.

In order, to test this, Hübl suggests photographing, at the same time as the original, a scale of grey tints of different intensity; and, as these would be unaffected by the colour sensitiveness of the plate or the filter, one will be able to judge of the gradations of the three negatives. Such a scale can be made with platinotype paper. To test whether the rendering of the colours is correct, a colour chart must be used.

The most frequent cause of failure is in the red-printing negative, and as a rule, retouching of the negative will have to be resorted to.

The cell for liquid filter recommended by Hübl is that made by Carl Zeiss, of Jena, which is five mm. in thickness and all the filters suggested by him are estimated for these cells, and, if the cell is thicker, the solution must be diluted accordingly. With lenses up to twenty-four cm. focus, the introduction of a piece of plate glass between the lens and object will not influence the focus as a rule, but with longer-focus objects optically polished glass must be used. Dry filters are recommended for practical work, and, to protect them, a second glass should be cemented on with Canada balsam and the edges bound round.†

* A statement which is not quite correct, as this has been pointed out once or twice.—A. D. P.

† Canada balsam differs considerably, and the finest is the dry, chippy sort, which is used for microscopic work. This should be melted in a water bath, and a little absolute alcohol added, and the screen and cover glass heated on a hot plate, and the two pressed into contact and allowed to set in a horizontal position under pressure; if left in a vertical position, the glasses are inclined to slip and the balsam exudes.—A. D. P.

The size of the image on the screen may be altered by the interposition of parallel glasses; and, as this is dependent on the thickness of the glasses, it is important to use glasses of the same thickness, and if a cell is used, and a filter not be required, the same cell, which must be used for such negatives, must, in this case, be filled with water.

For the preparation of collodion emulsion plates the reader is referred to Hübl's work, *Die Collodium Emulsion*, published by Wilhelm Knapp. There are two kinds of emulsion, and, for those dyes which require the help of silver nitrate or are acid, the ammonio-nitrate emulsion is recommended, whilst, for basic dyes, which cannot be used with silver nitrate, the chloro-bromide emulsion prepared with zinc bromide. To the first group of dyes belong the eosines and rhodamine, whilst cyanine, chinoline red, and acridine belong to the second group. The ammonio-nitrate emulsion is far more sensitive than the other, but is not so well colour-sensitised by the second group of dyes. To increase the colour sensitiveness of the emulsion, the plate, after setting, is bathed in half per cent. solution of silver nitrate, whilst with the second group of dyes, instead of this solution, a borax bath is used. All the plates should be exposed whilst wet, and developed with glycin.

Gelatine plates should be sensitised by bathing in the dyes, and exposed either wet or dry; the former, however, frequently give fuzzy images. Commercial orthochromatic plates, those that are sensitised with erythrosine, are not suitable for three-colour work, but Lumière's red-sensitive plates may be used for the blue-printing plate. Gelatine plates must be fully exposed, and glycin should be used as the developer. Very rapid lenses and well-illuminated originals must be used in order to obtain successful results.

It has already been pointed out that the theoretically correct colours for printing are nachtrosa, cadmium yellow, and a mixture of peacock blue and viridian green, but it seems that these colours are not permanent; Hübl therefore gives two alternate systems of working—the first, in which these colours are used, and which, by the bye, he designates as purple,* yellow, and blue-green; and an alternative method in which cadmium yellow, madder lake, and Paris blue are used; and he further states that stable inks of the latter kind are placed on the market by Kast and Ehinger.

The following procedure is recommended for sensitising plates and preparing the filters for the theoretically correct yellow, purple, and blue-green.

The negative for the yellow-printing plate: The sensitiveness of the plate should lie between F and G, and fade off towards E and towards red. The ordinary gelatine plate may be used, and the want of red sensitiveness is made up by the violet sensitiveness. This negative can then be made with an ordinary plate, without any further sensitising, without the use of a screen.† It is wrong to use a violet filter, as is generally recommended. With a collodion emulsion plate, however, acridine must be added to the emulsion and a bright violet screen used. To sensitise the plate to every 100 cm. of chloro-bromide emulsion, 5 cm. of a 1·150 solution of acridine (NO) should be added, and, when the plate has set, it should be bathed in one part of cold saturated solution of borax in three parts of water, and then exposed wet. As a filter, a 5 m.m. thick solution of pyoktamin 1·20000 should be used, or a violet collodion filter of the same colour.

The negative for the red-printing plate is made on a collodion plate, which is sensitised with the following mixture:—

Uranine (1 : 150 alcohol)	12 cm.
Eosine	6 ,,
Rose des Alpes‡	3 ,,

Of this dye solution, 2 cm. should be added to every 100 cm. of emulsion, and the plate bathed before exposure in a half per cent. solution of silver nitrate. Instead of this a collodion emulsion sensitised with yellowish eosine, 2 cm. dye solution (1 : 150), to every 100 cm. of emulsion, and bathing the plate with a half per cent. solution of silver nitrate.

As a filter, a solution of picric acid (1 : 1000) should be used in both cases, or a collodion film stained to the same colour.

If gelatine plates are to be used, they may be exposed wet or dry. For the former the following method is satisfactory: Bathe the plate in the following for about five minutes:—

Water	100 cm.
Uranine NO solution (1 : 850)	3 ,,
Ammonia	1 ,,
Silver nitrate solution (1 : 10)	2 drops.

Rinse with distilled water and expose wet. For a filter use a 1 : 500 picric solution 5 in. thick, or picric acid collodion screen.

For dry plate sensitise the plate in—

Acridine NO (1 : 150 alcohol)	10 cm.
Chinoline red (1 : 150)	1 ,,
Eosine solution (1 : 500 water)	1 ,,
Water	300 ,,

and expose behind a filter of—

Acid green solution (1 : 10,000)	4 cm.
Potassium bichromate solution (1 : 150)	20 ,,

or, as a dry filter, use a brilliant green, and aurantia collodion of the same colour.

Less correct results are obtained in practice with commercial orthochromatic plates with a filter of—

Acid green solution 1 : (10,000)	4 cm.
Potassium bichromate solution (1 : 150)	16 ,,
Water	5 ,,

or a dry filter of brilliant green and aurantia collodion of the same intensity.

The negative for the blue-printing plate is made on a collodion plate sensitised with chlorocyanine solution, 1 : 500, 5 cm. of which should be added to every 100 cm. of dye, and a filter of 1 : 500 solution of Biebrich scarlet used, or a dry filter of saffranine collodion of the same intensity, or a solution, 1 : 8, of potassium chloroplatinite may be used.

Gelatine plates may be bathed in—

Cold saturated solution borax	100 cm.
Chlorocyanine solution (1 : 500 fresh)	2 ,,

and exposed wet. If the plates are to be exposed dry, they must be rinsed with distilled water and carefully dried. The filter should be the chloroplatinite of potash or a dry filter of 0·3 per cent. of chrysoidine collodion, and 0·25 per cent. saffranine collodion. Lumière's red-sensitive plates can be used for this.

For the second series of inks, cadmium yellow, madder lake, and Paris blue, the following methods are suggested: For the yellow printing negative a collodion emulsion or a wet plate without a screen should be used; if gelatine plates are to be used, a violet screen should be used and either an ordinary or an orthochromatic plate should be used with a liquid pyoktamin filter (1 : 5000) or a Victoria blue collodion filter.

The negative for the red-printing plate, a collodion emulsion sensitised with yellowish eosine (1 : 500), 2 cm. to 100 cm. emulsion and as filter:—

Picric acid solution (1 : 5000)	15 cm.
Water	150 ,,

or a dry picric acid filter of the same strength. Better results are obtained by using the uranine, eosine, and Rose des Alpes, suggested above, if a filter of

Acid green solution (1 : 5000)	25 cm.
Picric acid solution (1 : 5000)	15 ,,

or a dry filter of brilliant green collodion and picric acid.

Gelatine plates sensitised with acridine, chinoline, and eosine, suggested above, should be exposed behind a filter of

Acid green solution (1 : 2500)	5 cm.
Picric acid (1 : 1000)	12 ,,

commercial plates are of little use.

The negative for the blue-printing plate, a cyanine-sensitised plate, is the best with a filter of Biebrich scarlet, as suggested above for the blue-printing plate, but slightly weakened.

For combination of three transparent films for projection, Hübl suggests—

For the red image	erythrosine in neutral solution.
,, yellow ,,	naphthol yellow in acid ,,
,, blue ,,	echtgrün bluish ,, ,,

* It may be noted that what Hübl calls purple, *i.e.*, the nachtrosa, we in English should call crimson.—A. D. P.

† It will be noted that this is contrary to the generally expressed opinion, but is advanced by Du Hauron in his recent work, *La Triplice Photographique*, and is the plan used in practical work by some operators.—A. D. P.

‡ Generally known in England as Rose Bengal. Can be obtained from Durand, Huguenin, & Co. Huningen.—A. D. P.

The last-named dye can be obtained from Bayer & Co., of Elberfeld. To use these, 1 grain of the dyes is dissolved in 200 cm. of water, and this kept as a stock solution. For use, these are diluted with from 10 to 20 times the quantity of water, and to the yellow and blue solution 5 to 10 drops of glacial acetic acid and some chrome alum are added to every 100 cm., and the gelatine images soaked in these.

Fairly full details are given as to the preparation of the inks for three-colour printing, and the various methods of printing are also touched upon with some valuable hints on the same; but to enter into this part of the book would take up too much space, but enough has been said to prove what an important addition to our knowledge has been made, and, to every one who can read the book in its mother tongue, I can promise a great treat and considerable enlightenment on a subject now attracting a great deal of attention.

A. D. PRETZL.

THE LATE M. CAREY LEA.

As briefly announced in our last issue, the death has just occurred in Philadelphia of Mr. M. Carey Lea, a valued contributor, and, for many years, American correspondent to this JOURNAL. The subject of this short memoir was born at Philadelphia in 1823, his family having been settled in Pennsylvania from the earliest days of the colony, having migrated from the mother country in 1680. His education was a liberal one, and, a natural bent leading him in the direction of chemistry, he passed several years in the analytical laboratory of the Pennsylvania Institute under Professor Booth, where he received that training which stood him in such good stead in his after-life researches.

At an early age, however, he broke down in health, and was compelled to devote several years to travel, chiefly in Europe; but these years were not wasted, since many opportunities were found for widening his scientific knowledge, and, more especially, of cultivating a love of art which resulted in the formation of a collection of works of the present and last centuries, as well as some of the older masters numbering upwards of 2000, and forming probably one of the finest collections of its kind in America. From his early breakdown Mr. Lea never thoroughly recovered, and throughout life suffered at intervals from troubles which necessitated his spending a good deal of his time in Europe, Italy and the Engadine being his favourite resorts. This weakness, coupled with a naturally retiring disposition, amounting almost to shyness, prevented his mixing much in scientific society either at home or abroad, and personally he was but little known beyond his own immediate circle of friends, although he possessed a world-wide reputation as a writer.

For it was not only in connexion with this JOURNAL, or with photography, that Mr. Lea was known, for, in spite of his once prolific contributions to our pages—and how numerous these were readers of twenty and thirty years ago will remember—he found time to devote himself to other researches, chemical as well as physical, the results of which were contributed to various scientific papers, but chiefly to *Silliman's Journal*, and occasionally the *Journal of the Franklin Institute*, and to the wide range of subjects covered by these researches it is impossible to do more than refer in the briefest possible manner, but his name will be occasionally found quoted as an authority in such works as Watts's *Dictionary*. In general chemical science he will probably be best remembered by his discoveries in 1862 in connexion with the manufacture of aniline colours. By the substitution of methyl nitrate for the iodide in the formation of methyl ammonia the manufacture of these dyes was greatly simplified, and his process or modification was quickly adopted by manufacturers in Germany, Switzerland, and France.

But it is in connexion with photography naturally that he will be best known to our readers, though to those of the present day his is little more than the shadow of a name, as, owing to growing infirmities, chiefly, however, to rapidly failing sight, his contributions to our own and other pages have been comparatively few in recent years. Curiously enough, when his long and intimate connexion with collodion emulsion processes is taken into consideration, his retirement from active work was almost contemporaneous with the advent of the growth of gelatine, and modern dry-plate processes are probably the only ones up to the present time in connexion with which Cary Lea's name will not go down to history.

It was in 1864 that Mr. M. Carey Lea first began to contribute to these pages, and shortly after this, on the retirement of Mr. Coleman Sellars from the post of American correspondent, he was installed in his place, and from that time commenced a close and regular connexion with the JOURNAL that lasted with scarcely a break of a week for fifteen or sixteen years. Considering, indeed, his numerous other duties and avocations, social and otherwise, and looking back at the work done for this JOURNAL in the "sixties" and "seventies," one is apt to wonder how Carey Lea found the time, for, in addition to two, three, and sometimes four columns of Correspondence two or three weeks in the month there would be a lengthy article from his pen on some other topic, experimental or controversial—for he was a strong controversialist—and has measured swords or pens with most of the great "fighting" writers of the past.

It would be absolutely impossible, within the limits of half a dozen notices such as the present, to give anything like an adequate idea of the wide range of Carey Lea's work in photography, or of the versatility of his mind. Although, when he took up a subject, he did so with a thoroughness and persistence from which nothing could turn him, he did not confine himself to any particular class of subject, and his choice ranged through all the branches, chemical, optical, and mechanical, and extended from the highest branches of theoretical science to the simplest operations of laboratory practice.

Thus one of the earliest, and at that time perhaps, one of the most practically useful, of Mr. Carey Lea's contributions was that in which he described his plate-cleaning solution, composed of bichromate of potash and sulphuric acid, a mixture that proved so effective, not only for that purpose but for removing old films and as a general laboratory detergent, that it became almost universally adopted, and familiarly known as "Carey Lea." The ferro-gelatine developer was another of his valuable contributions to wet-plate photographic practice, and consisted of a chemical combination of gelatine with the ordinary iron developer, which resulted in the deposition of the metallic silver, under the influence of the organic matter, in a much finer and closer state of division, and the consequent formation of a denser image. Originally published in 1865, the process of preparation was improved and simplified some years later, and it is not improbable that, had wet plates remained in general use, this combination would ere now have entirely displaced pyro, both for development and intensification.

Another of his laboratory formulæ, of about the same date, was the method of intensification by means of Schlippe's salt, a sulphide of sodium and antimony, which would, even at the present day, find wider use in process work, were it not for the evil-smelling character of the chief material.

But Mr. M. Carey Lea's name will be inseparably connected with collodion emulsion whenever the history of emulsion photography may be written. He took up the collodio-bromide process in 1866 or 1867, and kept working at that or "washed" emulsion without intermission right away until collodion was practically suppressed by gelatine. It was Carey Lea who first gave attention to the little minutiæ of working, neglect of which had rendered the working of collodio-bromide so uncertain in the hands of the earlier experimentalists. For instance, it was he who pointed out that, whereas many of those early workers who imagined they were working with an excess of soluble bromide in the emulsion, were really using an excess of silver, owing to their having left out of calculation the water of crystallisation of the cadmium bromide employed.

This was the great point in Carey Lea's view of emulsion photography—free silver—and to him is due, undoubtedly, the credit of pointing out its use and value, though possibly modern workers, like many of the older ones, would differ from him in some of the details. The late Colonel Wortley, indeed, went further than Carey Lea in the matter of free silver, alleging that it was necessary to *saturate* the emulsion with free silver. Other modifications of the original process consisted in the addition of iodide and chloride of silver to the emulsion prints, which also gave rise to very considerable controversy, while, as to the variations in "preservatives" and "organifiers" tried and recommended, it would be impossible to mention them. Carey Lea, however, introduced the method in a practical way of adding the organifier to the emulsion, so that the latter only required to be poured on to the glass and washed before use.

On the introduction of Mr. W. B. Bolton's washed collodion emulsion in 1874, Carey Lea was not slow to recognise its advantages, and at once began experimenting, with the result that in 1875 or 1876 he published his washed chlorido-bromide process, possessing a degree of rapidity far surpassing wet collodion. Whether this or similar processes would ever have come into general use is open to question, as the result of Carey Lea's experiments was rather to rob the original process of its simplicity without adding greatly to its advantages. Thus the precipitation of the emulsion, containing a large access of free silver, by means of a solution containing tanin, gallic and acetic acids, may be imagined to be one of some delicacy and requiring some manipulative skill to ensure success.

Although a most careful experimenter, Carey Lea was rather apt to

confine his field of mental vision, and thus often found himself at variance with others. As an example, in 1875 he published an elaborate series of experiments, showing that, contrary to all preconceived ideas, iodide of silver was *vastly more* sensitive to all the rays of the spectrum as well as white light than bromide; but the experiments were made upon paper—carefully enough prepared, it is true—and developed with *gallic acid*, but it did not strike Carey Lea that possibly with a different developer—alkaline pyro, for instance—the result might have been altogether different. Then again, as is well known, he was in opposition to Dr. Vogel in his views in connexion with what is now known as the optical sensitising theory, and held that the colour of the sensitiser had nothing to do with its sensitising action; or, if it had, the sensitising action was for the rays transmitted rather than those absorbed. Taking coraline as an example, one of the dyes then used by Dr. Vogel, Carey Lea found it to sensitise for red and yellow, but to have no effect whatever upon green, the colour chiefly absorbed; but here, again, he overlooked what has been termed the "screening" effect of the dye, and the fact that, under certain conditions, but not correct ones, such a result might possibly be apparent.

However, take him all in all, Mr. M. Carey Lea was a careful and capable experimentalist, and not a mere player at science, as his works testify. In 1870, he published a *Manual of Photography*, which went through two or three editions, and, though comparatively little known in this country, it is one of the best and most complete all-round works we have.

THE COLOUR OF THE NEGATIVE DEPOSIT.

[Read before the London and Provincial Photographic Association.]

Supposing that the making of a negative is not a fortuitous matter, but a deliberate scheming of means to ends, there are several means, or intermediate processes, which demand the serious consideration of the careful photographer. Not the least of these is the choice of the colour of the deposit of the negative. It is upon this subject-matter that I have elected to offer you a few observations to-night, rather, indeed, with the hope of obtaining some useful information from you than with any intention of making an instructive oration. In fact, I may as well at once disclaim any ability upon the latter score. I am one of those fortunate, or unfortunate, individuals—it depends upon the point of view—who constantly find fresh opportunities for acquiring modifications of photographic belief, and with each modification a fresh perception of how much there is to learn. I should certainly be prepared to sacrifice a great deal to possess the equable temperament of one of those primeval fossils who, having been convinced, in the ages that are past, that a certain developer or thing was the best, continues to use it in full faith, until the crack of doom or his earlier decease. But I think I could be happier still if I could but acquire the light-hearted enterprise of the budding beginner, who tries all things in less than no time, and is satisfied that they are all bad-plates, developers, and manufacturers alike, and who ignores the possibility of the error and failure being due to himself or his methods, or lack of method of working. Happy man! happy temperament! But hope as well as love tells a flattering tale, and, though the time may be long and the way messy, before disillusionment comes, come it must at last.

But, whilst one may contemplate with, envy or otherwise, the attitude of others towards old things and new, if a negative is to be made, it is as well to make an effort to determine what kind of negative is desired—or desirable—before, rather than after, the negative is made. Confining myself to-night to the question of the colour of the negative deposit, I propose to deal briefly with the question, What colour of deposit is most useful for photographic purposes? An answer to this question is as likely to be found in any subsequent discussion as in my remarks.

A well-known photographic personage has declared that a perfect negative should consist of pure silver in clean gelatine; but this phrase, like most other phrases, is rather ear-satisfying than instructive. Supposing, however, that one could get such a negative, it remains a matter of opinion whether the best print could be obtained from it.

Let us descend from the altitude of the perfect negative to the level of the every-day article. This we find to consist of nearly its antithesis, viz., silver and organic stain in dirty gelatine. As a broad generalisation, I think I may safely say that, bad as the average negative is, it is better than the perfect one would prove. The perfect negative looks well and prints ill, the dirty negative seldom prints worse than it looks.

Here we arrive at a first conclusion, viz., that a clear, bright-looking negative is seldom a satisfactory intermediary, and I do not think I can more clearly illustrate this point than by instancing the difficulty of making good pictorial photographs on emulsions of the lantern-plate type.

From this point I proceed to suggest the necessity of the presence of some colour throughout the negative, that is to say, throughout the silver, and throughout the gelatine as well. I am inclined to think that it is the judicious organic stain in and around the metallic deposit which largely determines the valuable printing qualities of a negative. It is, however, a very far cry from this desirable stain to the beautiful yellow, and yellow-green abominations, which may be said to be the apotheosis of pyro. Pyro—dear, good, old, dirty, messy pyro—the quintessence of ungodliness (if cleanliness be next to godliness), what sins—photographic sins, of course—have not been laid to your charge; and yet it is just as possible to make a clean, bright negative, of the "perfect" order, with pyro, if one only knows how, as with any other developer. Pyro suffers under the disadvantage that its yellow stain sometimes makes an otherwise impossible negative not quite so impossible, and so, by an involved inference, the stain is invested with qualities, photographically valuable, which certainly don't belong to it. So far as this class of negative is concerned, I like it as little as I like the "perfect" type of negative, but for dissimilar reasons.

Of these reasons an important one is the serious length of time required to reproduce from it. More important is the difficulty of accurately gauging its value visually. Now, when one desires to make a negative so as to produce a certain result, and not on the off chance of winning a medal or securing an invitation to exhibit at the Salon, perhaps the most important quality that it should possess—at the least it is a very desirable one—is that it shall be of such a colour, or of such characteristics, that an experienced observer shall be able to gauge its printing value to a nicety. So far as I have been able to observe, it is more easy to accurately value a negative in a cold or neutral monochrome than in any other colour; and here, then, I arrive at a second conclusion, that from the weakest point of view a neutral grey is the colour the tone values of which can be most accurately estimated visually.

Unfortunately, however, this is the colour of deposit which often, in my experience, produces negatives yielding prints which are good in every technical sense, except in that vital one which photographers call "quality." Many devices have been made to overcome this defect. Special printing papers have been and are manufactured, but I think that these are but the refuge of the helpless, and, when the negative itself is at fault, it is better to endeavour to deal with the cause than to try to avoid the effect.

The remedy, I believe, is to secure a correct exposure of the negative. This brings me to a third point, viz., that it is probably more difficult to make a good negative in a neutral monochrome than in a more highly coloured image. I put this forward as a pious opinion rather than as an assertion of a proved fact. I admit to being somewhat unorthodox—as orthodoxy on this point goes just now after published judgment in the Watkins' competition. I don't think there is much latitude in exposure if a definite result be desired. Given a certain object to be reproduced by photography, varying exposures will produce differing representations, any one of which may be the desired result. I believe, however, that no other exposure, however manipulated in development, will produce this particular result, the tone values will differ. In my experience, twenty per cent. difference in exposure is generally sufficient to produce a noticeable variation. But I admit that, with a highly coloured deposit, surprising results may sometimes be obtained from obviously incorrectly exposed plates. It is difficult, however, to judge them before printing, and I regard them as a hindrance to serious work.

Having expressed my preference for an image of a neutral colour, perhaps I may go a step farther and declare my further preference for such an image produced by pyrogallic acid. This brings me to my final point, viz., that an organic image deposit is of immense importance and value in bestowing that aforesaid characteristic of "quality" to a negative. To produce a good print, a negative must have a certain light-resisting deposit. A thin negative, however true in gradation, never produces a rich print, at least that is so in my hands. Such a negative as I have attempted to describe, however, need not be—in fact, it must not be—thin, and my preference for pyrogallic acid as a developer is founded on the general experience that negatives made by its aid have greater light resistance (I use the word in the special sense which I have given it) than have negatives made with other reducers. This, however, possibly is due to lack of persistent use of the experiment with the other developers, or it may be that unconsciously I am one of the fossils to whom I made a tender reference in the earlier portion of these remarks.

It is difficult or impossible to say anything which is new or which has not been said before upon so trite a subject as that with which I am dealing to-night. Obviously, if a man produces good and regular work, it is an impertinence to regard his methods querulously. The picture's the thing. But I am not now discussing the picture, but the most certain way of attaining it, and I admit to having been converted to the preference for a neutral-coloured deposit, rather by the fact that such a deposit is an exceedingly convenient one when photography is followed as a business and not as a recreation. I have an acquaintance who makes his negatives a beautiful yellow-green. They print well in the summer time, when the days are long and the summer sun is high in the heavens; but, as a corollary to these remarks, I may say that I have no doubt it is not the yellow colour in his negatives which saves them from thinness, but the organic deposit in the actual image. This I should expect to be as effective if there were no concomitant general

stain. But I have said enough, and these technicalities may weary you. If, however, they lead to useful discussion, I shall be amply repaid. In any case, I have to express my thanks to you for the compliment of asking me to appear here before you to-night. S. Herbert Fry.

THE INTERNATIONAL PHOTOGRAPHIC CATALOGUE AND CHART.

In the month of May, last year, the permanent Comité International, for the execution of the photographic chart of the heavens, says *Nature*, met at Paris to discuss various questions which had been left undecided at previous Conferences, and to inquire into the state of progress of the work of the various observatories participating in this international scheme. At these meetings, in addition to the members of the committee, several guests were invited to be present and take part in the discussions.

The report of the proceedings, which has just been published, commences with a brief reference to the work of each of the observatories that is partaking in this scheme, the President (the late M. Tisserand) stating that the undertaking, as a whole, was in a satisfactory state of advancement. The report then refers somewhat in detail to the numerous questions that had been prepared for discussion at these May Conferences, from which we make the following brief extracts.

With regard to the catalogue, the first resolution adopted, as the result of a special committee of inquiry, composed of MM. Donner, Dunér, Jacoby, Paul Henry and Scheiner, was that the probable error of the values of the rectilinear co-ordinates measured on the plates ought to be as small as possible, and that the measures should be made such that this error should not exceed 0″·20.

It was further resolved to publish, as soon as possible, the rectilinear co-ordinates of the stars photographed, and that this publication should also contain the data necessary for converting these results into equatorial co-ordinates. The Committee expressed the desire that a provisional catalogue of right ascensions and declinations might be published by those observatories whose resources were sufficiently large. Each observatory is allowed to choose the positions of those stars of reference in the catalogues which appear the most convenient to them. For the calculation of the constants of the *clichés*, a minimum, if possible, of ten stars of reference must be allowed, and the adopted positions of these stars should be published. It was decided to postpone to a later date the discussion relative to the question of using a uniform system of constants for all the observatories for the reduction of the stars to the epoch 1900. All agreed, however, that an identical form of publication for all the observatories should be adopted, that of the catalogue of the Paris Observatory serving as the type. Each observatory can determine the photographic magnitudes, either by means of measurement or by estimation. The only stipulation the Committee imposes is that the methods employed must be such that the magnitudes in different observatories can be reduced to a common system.

With reference to the so-called photographic chart, five resolutions were adopted, namely:—

(1) That each observatory will be provided with a scale (furnished by Captain Abney) of densities, which will be impressed on the plates simultaneously with the *réseau*, by which the sensibility of each plate for the luminous objects of different intensities will be controlled.

(2) For the construction of the chart, the second series of *clichés*—that is, those whose centres are of equal declination—will be exposed three times for a period of thirty minutes each. The time of exposure may be diminished if a decided increase in the sensibility of the photographed plate be noticed.

(3) The Committee selects, as the best method of reproducing the chart, the photogravure on copper from the *clichés*, with three exposures on them, the original scale being doubled.

(4) Each observatory will make two contact glass positives of each negative, one of which will be preserved in the building of Breteuil, part of the Bureau International des Poids et Mesures.

The next meeting of the Committee will probably occur on the occasion of the Universal Exhibition, in the year 1900.

NOTES ON BRITISH GEOLOGICAL PHOTOGRAPHS.

[Extracted from the Geological Magazine, 1897.]

A year ago, by the decision of the Council of the British Association, there was sent to the Museum of Practical Geology a large collection of photographs, mainly taken with a view of illustrating, in the most permanent and unbiassed way at present possible, the features and phenomena of geological interest in the United Kingdom. The project of forming such a collection originated with Mr. O. W. Jeffs in 1888, when he read a paper on the subject at the British Association at Bath, in which he pointed out the utility of such a collection and the necessity for forming it. When a committee was appointed in the following year he undertook the management of the work, and he has carried it on for seven years with indefatigable industry and scrupulous care, only relinquishing it when the size of the collection began to exceed the capabilities of private control, and when his own lack of leisure no longer permitted him to devote the requisite time and attention to its custody. Twelve hundred photographs had been acquired by 1895, and it was then thought advisable that the collection should be lodged in the Library of the Museum of Practical Geology, where it would be available for reference by all those who wished to make any real use of it.

The year that has just elapsed has been occupied in cataloguing and rearranging the collection so as to make it more easy of access and reference. This has been rendered possible by the adoption of self-binding mounts of standard size (15½ in. by 12 in.), which can be shifted into different portfolios as required. The work is now far advanced towards completion, but the necessary remounting of the earlier part of the collection is a matter of time and expense, so that it may not be quite finished even within the present year. Still the most valuable part is that which is being dealt with first; and only those districts which are already well illustrated, and even in some cases over-illustrated, are being left until a later period.

It has been thought worth while at this stage to publish some account of the purposes of such a collection, to describe the character of what has been already brought together, and to indicate the directions of future development; for it must at once be stated that finality has been by no means reached yet, and there is a great deal of work which ought to be completed in the next few years, before the whole country will be well illustrated, and before, so to speak, sufficient capital has been created to enable the collection to exist on its average income.

The objects of the collection can soon be stated. It is obvious, in the first place, that it is well to have geological phenomena of all sorts photographed. Pictures so taken, under proper precautions, are entirely trustworthy; the personal element can hardly enter into them, and they, as a rule, present the bare facts denuded of the halo of interpretation. A paper by Mr. Cope Whitehouse on Fingal's Cave presses home this truth, and makes a good deal of fun out of the old illustrations and drawings of this curious feature when compared with a photograph. The comparison is quite justifiable when and where photographic illustration is possible, and one would be only inclined to point out that not a single photograph, but several, are usually required, so that the thing may be seen in the solid, and not in one plane, and that drawings are, and always will be, the necessary adjunct to the photograph, if we are to interpret as well as see. Very many phenomena readily submit to photographic treatment, and though the first qualifications of a geologist should be travel, and travel, and again travel, he cannot see everything, and even the most experienced traveller may be guided and helped by seeing photographs before he visits a place, and may correct his impressions by means of them when he comes back, or, if he himself does not need such an aid, they may at least be useful to him in convincing his friends who have not been so fortunate. How we should like to have, for instance, a photograph marked by Salter himself, to show exactly where he drew his line between the Caradoc and Llandovery rocks, or of some of the older-type fossils which it is so hard to recognise in our museums.

It is still more important to preserve such photographs as have been used to produce process blocks for scientific purposes, or as a basis for the preparation of drawings; the Committee has already begun this work, and proposes to continue it if the friendly aid of editors of geological publications can be secured. As an example of what can be done we may refer to the splendid series of photographs of the dry valleys about Clapham in Yorkshire taken by Mr. Bingley to illustrate Mr. Tate's paper in the Proceedings of the Yorkshire Geological and Polytechnic Society. This is but one of the more recent examples, but many others might be quoted. Micro-photographs of organisms and rock sections, views of quarries, boulders, glaciated surfaces, pebbles, structures in aqueous, igneous, and foliated rocks, and a host of other things, frequently reproduced by process or drawings, ought to be represented in this collection by permanent prints from the original negatives.

W. W. Watts, M.A., F.G.S.

(*To be continued.*)

CAMERA CLUB CONFERENCE.

The concluding sitting of the Camera Club Conference took place on Wednesday evening in last week, when Captain Abney took the chair.

The Members' Exhibition—Art and Photography.

Mr. G. A. Storey, A.R.A., read a paper upon *The Members' Exhibition from an Artist's Point of View*. He was well aware, he said, that the truth-telling camera was one of the greatest aids to science, and that photography was in itself a science with an almost boundless scope, the usefulness of which was increasing day by day; but the art side of it—the pictorial or decorative element—still left much to be desired, because it seemed to have gone as far it could go. The trained eye, the eye that looked for, and the heart that rejoiced in, the beautiful, could in an instant see and know a beautiful picture, even a long way off, for the effect of fine art was irresistible, and greater, perhaps, than mere clever art. The members' Exhibition, which was ostensibly an Exhibition of pictorial photography, was not altogether satisfactory in this respect. If the pictures on the walls were quite right, from an art point of view, however small they were, they should tell out

across the room, and, with a few exceptions, they did not do so; they seemed to lack that originality which was the keynote of true art; he had seen so many of the same kind before, and he could not help suggesting that photographers might seek fresh fields and pastures new. As an instance of an artist-photographer who did what he was hinting at, he mentioned Mr. Evans, who, in his views of cathedrals, was not content with the mere reproduction of the sacred walls and their antique columns and vaulted roofs, but watched day after day for the moment when a ray of light streaming down upon the pavement gave lustre and beauty to the work, and decided exactly how much should come into the picture in order to give full value to the portion finally selected. This was artist's work, and must be gone through if the photographer wished to exhibit a picture as a work of art. He knew that photographers had great difficulties to contend with, and he had the highest respect for those who turned out really beautiful work from nature; in painting, there was nothing to cramp genius, or to stay its most ambitious flight in any direction, upwards or downwards, or topsy-turvy. If photography was to adorn our walls, it must possess those qualities which do not tire, that excellence of light and shade and composition which were inseparable from good art work, besides its own merits as a photograph. There was no limit to art, and there must be no limit to photography; the painter or the poet depicted his own thoughts in his own medium, and the great problem for the photographer to work out was how he could do the same thing with his camera. The lecturer expressed much liking for the magic lantern, but thought the pictures passed out of sight too soon; a photographic exhibition would be very enjoyable if it were made up of large transparencies let into the walls like stained-glass windows, by which means the pictures could be contemplated at one's ease, and without trying one's eyes. In conclusion, he suggested as a motto which a photographer might write upon his camera, the words "Taste with faithfulness;" if these words were whispered into the "little box," that "little box" might reply, "Yes, you do the taste; I'll do the faithfulness."

Mr. Storey proceeded, at the request of the Chairman, to make some critical remarks upon a few of the pictures exhibited, and selected for favourable mention photographs by Colonel Gale, H. E. Davis, Noel Cox, R. M. Cox, Viscount Maitland, T. Manly, C. Hussey, Paul Lange, E. R. Ashton, and others. Referring to a view of Canterbury Cathedral, he said it might be a very good photograph, but it was not a good picture, for, by including the whole of the building and a wealth of fine detail, the idea of grandeur, bigness, space, and atmosphere had been sacrificed, and the picture was more like a representation of a beautiful model to scale. Asked to explain his statement that nature was not art, he said art was nature seen through the mind of the artist; if nature were art, then any haphazard sketch or photograph would be art.

The Earl of Crawford suggested that art might be defined as filtered nature.

Mr. Austin thought some of the difficulties of photography arose from the fact that the photographer could not devote his attention exclusively to the artistic consideration of his subject, and that, when taking a picture, his mind must be more or less occupied with the manipulation of his camera—exposure, development, and so on. As to the sameness about photography to which Mr. Storey had alluded, he thought the same remark applied to painting, for there was an extraordinary sameness about the Academy and other exhibitions.

Mr. H. E. Davis, whose costume picture, *The Siege Master*, had been commended by Mr. Storey, expressed the opinion that an artist, who knew what one wanted, and could play up to one, formed the only satisfactory model.

The Rev. F. C. Lambert quoted two definitions of art: "Art is art because it is not nature," and "Art is nature seen through temperament." He thought Mr. Storey made a rather startling statement when he said that a good picture was bound to strike one at once, for, in his own experience, he had found that by again and again inspecting a picture, he had learned to appreciate something which, at first, had not particularly appealed to him. It had been said, too, that a beautiful picture could be immediately recognised across a room.

Mr. Storey explained that he did not mean one could distinguish details, but that the light and shade and colour and general aspect of a good picture would strike one at once, even from the opposite side of the room. A fine work of art made one say, "There is something good, I must go and look at it," and, as one looked, one admired it more and more.

The Earl of Crawford said it was very difficult to say what was art, because art differed so widely, and different phases of it could not be compared. Were we to follow the school of Meissonier or that of the Glasgow painters, the school of Michael Angelo or that of Teniers?

Mr. Storey replied, Follow that school which you like best. Art resembled a bed of flowers, and, although the flowers differed, there was no reason why one should not admire them equally, for, in even the commonest of them, one could recognise that they were living, growing things, springing up from the earth towards the heavens, the air, the light. The work of Michael Angelo and Teniers was different, but it was all art, and that was why he said art had no limit.

Mr. Asbury Greene, referring to the motto, "Taste with faithfulness," suggested that taste was dependent upon current opinion and fashion.

Mr. Storey said, of course, "there was no accounting for taste," as the old woman said when she kissed the pig; but, by taste he meant refinement, high culture, and, as an example, he mentioned the pictures of Watteau, the refinement and grace of which nothing could exceed.

The President, in closing the discussion, remarked that the reason why transparencies were so pleasing to the eye was that the range of gradation was much greater than in an ordinary print, being about 200 to 1 instead of 30 to 1. He briefly summed up the discussion, and, a vote of thanks having been passed to Mr. Storey, the Conference terminated.

The Annual Dinner.

On Thursday evening, May 6, the Annual Dinner of the Camera Club was held in the large room of the Club, Charing Cross-road, and the experiment appeared to be so successful that probably this festivity will not in future take place at an outside dining-place. Captain Abney (the President of the Club) was in the chair, and there was an attendance of about eighty members and friends, including Sir H. Trueman Wood, M.A., Messrs. W. Clarke, Seyton Scott, T. R. Dallmeyer, G. Davison, E. Calland, W. H. Walker, A. Stroh, E. J. Humphery, Freer Austin, R. W. Cox (ex-Hon. Secretary), T. Bedding, Horsley Hinton, Snowden Ward, Dr. Patterson, Messrs. R. W. Craigie, R. T. Watkin Williams (Hon. Secretary), Powles, &c. The toast of the Camera Club was submitted by Mr. Horace Wilmer, who also subsequently responded for the "Visitors." The dinner was an admirable one, and its success was enhanced by many amusing songs, recitations, and stories, the latter invariably being a strong feature of Camera Club festivities.

IMPORTANT COPYRIGHT CASE.

At the Bradford Borough Court, on Friday last, a man, named Englander, residing at 6, Neal-street, Horton-lane, was summoned for infringing the law of copyright by copying and selling photographic reproductions of copyright paintings and engravings. Summonses were taken out in respect to thirty charges, fifteen of them for selling and the remaining number for making copies of copyright pictures; the latter, however, were withdrawn. Mr. James Freeman conducted the prosecution, and Mr. Curry represented the defendant, who did not appear in person.

Mr. Freeman quoted the section of the Copyright Act under which action was taken, showing that the penalty for each offence was 10*l.*, which meant 10*l.* for each copy of a copyright picture with which the defendant was found dealing. He proposed to proceed first with the charges of selling piratical copies, and he should be able to prove that the defendant had knowledge that the original pictures were copyright, and that he had no authority, or had never obtained consent, either to make or sell such copies. The first summons was in reference to a picture called *The Return from Calvary*, of which Mr. Lucas and another person were co-owners. It had been exhibited in Bradford and other parts of the country, and as many as 4000 persons had paid for admission in one day. The defendant had obtained photographic reproductions of the picture, either from the original painting or the authorised engraving from it, and had sold at least thirty copies in Bradford. He had also dealt in a similar manner with a number of other copyright and Academy paintings, to the great detriment of the holders of the copyrights in each case. Mr. Freeman asked for maximum penalties in respect to each case that he was able to bring home to the defendant.

Arthur Lucas, art publisher, New Bond-street, London, produced the certificate of registration at Stationers' Hall in respect of the painting, *Return from Calvary*, by Herbert Schmalz. He and his partner had paid him 1200*l.* for the right of reproduction, the copyright, &c., and altogether had spent about 5000*l.* in bringing the picture before the public. He produced authorised engravings from the original painting which had been sold at from two guineas to eight guineas, and also produced the photographic reproductions sold by the defendant, which, he maintained, were mere abortions of the original.

Joseph Bentley, bill-poster's manager, Bower-street, gave evidence as to interviews which he had had with the defendant, and to the purchase from him of copies of the photograph, the *Return from Calvary*, for which he paid the defendant 8*s.* per copy, framed. He was also shown twenty or thirty photographs, which the defendant stated were reproductions of copyright and Academy paintings photographed by himself, and for each of which he asked 8*s.*, including the frame. In cross examination by Mr. Curry, witness stated that he had been instructed by Messrs. Matthew & Brooke, art dealers, Bradford, that a number of reproductions of copyright pictures were being sold by the defendant, and, in company with Mr. Eustace Field, of London, he arranged for an inspection of the defendant's stock in trade, with the result that witness purchased four photographic reproductions, two of them being the *Return from Calvary*, and Mr. Field also purchased specimens.

Francis Eustace Field, of New Oxford-street, London, corroborated the previous witness's statement as to his purchasing copies of the *Honeymoon*, *First Words of Love*, *Wedded*, and *Passing Cloud*, besides two plain copies of the *Return from Calvary*, and a coloured copy of the latter, for which he paid 16*s.* On May 1 he again met the defendant, and was shown a fresh batch of photographic reproductions, forty or fifty in number, all of them being of copyright paintings. Mr. Curry, for the defendant, contested many points in the evidence adduced, but called no evidence on behalf

of his client. One reason for this was that a civil action on similar lines was pending against the defendant, and for whose protection he reserved any evidence which he might have to produce. If conviction followed, he asked that a merely nominal penalty might be imposed. Mr. Skidmore imposed a fine of 5*l.*, and 5*l.* 10*s.* 6*d.* costs, or, failing distress for default, one month's imprisonment in respect to one issue of the *Return from Calvary*, and, in respect to three other summonses for similar reproductions, a fine of 40*s.* was imposed, with costs, or in default ten days' imprisonment.

The defendant was next proceeded against by the Fine Arts Company, New Bond-street, London, for selling photographic reproductions of the picture *First Words of Love*, by Perugini, two cases being pressed against him. Mr. Leonard Earle, Secretary of the Company, proved the certificate of registration of copyright, and other evidence of publication by the defendant was adduced. In the first case a fine of 5*l.*, with 3*l.* 1*s.* costs, was imposed, or in default one month's imprisonment, and in the second case a fine of 40*s.* and costs, or ten days' imprisonment.

The defendant was also proceeded against in respect to five other copyright paintings, of which he had sold photographic reproductions, namely, *Wedded*, by the late Sir Frederick Leighton, the *Peacemaker*, the *Passing Cloud*, and the *Honeymoon*, all by Marcus Stone, and the *Breach of Promise* by another artist. In each case a fine of 3*l.*, with costs, was imposed, making altogether a sum total of about 50*l.*, in which the defendant was mulcted, with alternative terms of imprisonment extending to upwards of five months.

Our Editorial Table.

Modern Developers.

Fuerst Bros., 17, Philpot-lane, E.C.

Messrs. Fuerst Bros. send us a copy of their little booklet on *Modern Developers*, which they are issuing for the second year. They inform us that they will send a copy of the booklet to any of our readers on receipt of request. *Modern Developers* is an excellent guide to the use of Hauff's glycin, amidol, and metol for negative and positive work. We extract from it the formulæ for "stand" development, concerning which we occasionally have inquiries. "Metol may be used for stand development, but glycin s preferable. The following are the solutions:—

Metol Solution.

Water	1000 cm.	or	10 ounces.
Sulphite of soda cryst.	40 grammes	or	200 grains.
Metol.....	2 „	or	10 „

Glycin Solution.

Water (hot)	100 cm.	or	1 ounce.
Glycin.....	2 grammes	or	10 grains.
Sulphite of soda	2 „	or	10 „
Carbonate of potash ..	10 „	or	50 „

When all has dissolved, add water 900 cm. or 9 ounces.

Development is effected in ordinary dishes. It is, however, advisable to have special dishes, in which a dozen or eighteen plates may be inserted, so that each plate is kept in position that it does not touch the others. Fill this dish so that the plates are entirely covered, then cover the dish in a light-tight manner to enable the dark room being left. The plates will develop by themselves slowly or fast, according to the exposures they have received. From time to time they are looked at, and those that are finished are taken away and fixed. Do not, however, stop development too soon, as with this process the density in fixing loses more than with ordinary development. A plate which has been over-exposed thirty times is completely developed in about fifty minutes. A normally exposed plate is completed in thirty minutes. An under-exposed plate will take from one to three hours, according to the degree of under-exposure."

Catalogue Received.

Adams & Co., 26, Charing Cross-road, W.C.

In sending us a copy of their new catalogue, Messrs. Adams & Co. inform us that it has been brought right up to date—an important matter, they point out, as the price of nearly everything in the trade has lately been altered. A new system is adopted, for the benefit of those who do not care to pay for the catalogues, of enclosing a sixpenny coupon, which is redeemable. A glance through the catalogue shows it to be a complete *résumé* of the requirements of the modern photographer, among which Messrs. Adams's well-known specialities in hand cameras, view-finders, &c., are given well-deserved prominence.

La Grille.

L. Gaumont & Co., 57, Rue Saint Roch, Paris.

M. Gaumont, who has patented this little device, draws attention to the fact that a greater or less degree of "flicker" characterises all projections of animated photographs. This defect it is the function of "La Grille" to obliterate, or, at least, render less apparent. From the illustration it will be seen to resemble in construction a fan, the upper portion of which has a series of transparent openings through which the spectator looks at the pictures on the screen. There are many other advantages claimed for the instrument, and the principal one should make it welcome to those who delight in witnessing displays of animated photographs.



News and Notes.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, May 19, at eight o'clock. *The Spectroscope and its Application to Photography*, with illustrations, by Mr. E. J. Wall.

Ostend.—At this popular resort there is an amateur Camera Club held at Rampe du Kursaal (Villa des Monettes). Mr. C. Drobig is Secretary, and a studio and twelve dark rooms are placed at the disposal of members.

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, May 18, at eight p.m., at 12, Hanover-square. *Notes on the Working of the Photo-aquatint Process, and on some of the Apparatus used*, by T. Huson, R.I.

Mr. W. H. Wilshere, of 236, Lavender-hill, Clapham Junction, is the new Hon. Secretary of the West Surrey Photographic Society. The meetings are held every Thursday at eight o'clock at the Felix Institute, Lavender Hill, S.W. Sunday outings are officially organized by the Society.

The private view of the Society of Miniature Painters' second Exhibition, will take place on Saturday, the 15th inst., at Messrs. Graves & Co.'s Gallery, 6, Pall Mall, S.W., and the Exhibition will be open to the public from the 17th inst. to the end of June. All exhibits will consist of works by contemporary artists.

Sir David Salomons, Bart., the Patron, and Mr. F. G. Smart, the President, have each been presented by the Tunbridge Wells Amateur Photographic Association with a gold key of the club-room, enclosed in a beautifully embroidered sachet bearing their arms, and Mr. H. P. Robinson, the only honorary member, has also been presented with the same, the sachet having his initials embroidered thereon.

The Streatham Photographic Society intend holding a special meeting on the 18th inst. at the Beehive Assembly-rooms, when Mr. C. H. Oakden, Secretary of the South London Photographic Society, will lecture on *Architecture*—with lantern illustrations. There will also be a demonstration of *Animated Photography*, by Mr. Heinze's Pholimeograph. The Secretary, Mr. Laws, of 14, Greyhound Lane, will gladly forward complimentary tickets to members of other societies upon application.

A Declined Engagement.—One of the most noted women lecturers in the east is having a great deal of amusement out of a letter she received not long ago from an unheard-of little town up in Maine. The writer of the letter said: "Dear Lady—We want to git up some kind of an intertainment for the benefit of the band boys in our town and it is thought that mebbe one of these sterryoptican pickcher lecktures by you would draw if the pickchers was good. We would want something of a lively caracter that would give the band a chance to come in with 10 or 12 selections during the leckture the whole to end with a free dance to which you would be invited. Please let me know your turms by return of male and say if you can come on the 13th inst. P.S. The band will meet you at the depot and give you a sirenade at the hotell." When the lady wrote politely declining the engagement, she received a second letter, saying briefly: "Yours to hand. It's all right, for we have concluded to turn the whole thing into a dance and cake walk. We'll give you a chance some other time."

UNDER the title of *The London Argus* will be published, early in May, a penny weekly illustrated paper, exclusively devoted to the local concerns of the metropolis. The new journal will deal comprehensively with the doings of the various public bodies engaged in municipal work, giving particular attention to the Vestries and Boards of Guardians. It will also contain several interesting special features, including a weekly signed article by a leading public man on some question of current interest. In politics the paper will be uncompromisingly Unionist, and will be published by Messrs. J. S. Virtue & Co., Limited.

AINTREE PHOTOGRAPHIC SOCIETY.—Referring to the recent announcement that the Annual Exhibition of this Society would take place on December 9, 10 and 11, the following are the particulars of the Open Classes:—For Amateurs only. Class H. (Landscape, Seascape, and Architecture) set of four direct prints, any size. Class I. (Hand-camera work, set of six direct prints, any size or subject, camera to have been held in the hand.) Class K. (Enlargements, set of two, not less than four times enlarged. must be accompanied by direct print from negative.) Class L. (Lantern Slides, set of six, any subject.) For Professionals only. Class M. (Figure Studies and Portraiture, set of four.)

DURING the visit of the Prince and Princess of Wales to Hawarden, and before the departure of the Royal party, a group photograph was taken of the Prince and Princess of Wales, and Mr. and Mrs. Gladstone. The picture will represent his Royal Highness and Mrs. Gladstone sitting on chairs in the foreground, with the Princess of Wales standing behind in the centre, and Mr. Gladstone on her right. Mr. Gladstone at first showed evident diffidence at appearing too prominently in the group, but a lively little appeal from the Princess speedily prevailed. The sight of the posing was, of course, a delightful experience for the crowd. The ordeal over, the Royal visitors took a farewell of their aged host and hostess and drove away.

THE subject for the Adams Prize at Cambridge University, to be awarded in 1899, is the theory of the aberration of light. It is desired that the essay should contain a discussion of the exactness of the usually assumed law of aberration, and of the evidence afforded by experiment and observation of any effect on the motion of the ether due to the earth's movement. The prize is open to all persons who have at any time been admitted to a degree in the University. The essays must be sent in to the Vice-Chancellor on or before December 16, 1898, privately. The successful candidate will receive about 97*l.* He is required to print the essay at his own expense, and to present a copy to the University Library, to the Library of St. John's College, and to each of the four examiners.

EAST LONDON ART EXHIBITION, 1897.—In celebration of the sixtieth year of her Majesty's reign, the Hon. President, Patrons, and Executive Committee of the East London Art Exhibition announce that an Exhibition of paintings, water-colour drawings, engravings, etchings, photographs, chromos, process work, &c., will be held at the People's Palace. The Exhibition will be open from May 24 to September 30. The object of the Exhibition is to bring to the vast population inhabiting the East End of London, some of those treasures in art which would be practically inaccessible to them, save under the circumstances which surround the present movement. The Exhibition will be open daily from two to ten p.m., and only a nominal charge will be made for admission, sufficient to meet a portion of the expenses.

"THOSE sleek and successful artists who supported the Bishop of London at the dinner of the Artists' General Benevolent Institution on Saturday," says the *Chronicle*, "must have listened in pained surprise to his Lordship's candid remarks on the uncertainty of success. Heaven forbid that we should differ from Dr. Creighton as to 'the impossibility of divining the reasons for success or failure,' but we doubt whether his view that 'many present who had been successful must often have wondered why they had been so, and must sometimes, when in a cynical mood'—fancy an R.A. in a cynical mood!—'think that the public taste was very incapable of proper discrimination,' will have commended itself to the guests at the top table. It must have been those below the salt who punctuated these remarks with 'hear, hears,' and 'laughter.' As for the successful R.A., everybody knows that it is plain transparent merit that carries him into the Academy, and, if any have a doubt on the subject, let them go the Academy, and note the large amount of space the works of the elect occupy on the walls, and then, of course, they will doubt no longer."

SOUTH LONDON PHOTOGRAPHIC SOCIETY'S DINNER.—The First Annual Dinner of the South London Photographic Society was held on Saturday, May 8, at the Montpelier, Choumert-road, Peckham, S.E. The President of the Society (Mr. F. W. Edwards, F.R.P.S.) occupied the chair, and was supported by a capital muster of members and visitors, including Messrs. J. H. Oakden (Hon. Secretary), M. Howell (a member of the original South London Society, and who here responded to the toast of "The Society," given by Mr. Welford), E. J. Wall, Horsley Hinton, Bedding, W. Thomas, W. F. Slater, J. T. French, C. F. Dickinson, A. E. Allen, E. A. Whitby, W. R. Jarvis, E. G. Ruckes, and many others. An enjoyable programme of songs and recitations had been arranged. Replying to the toast of "The Officers and Committee," the Hon. Secretary (Mr. Oakden) gave an account of the position of the Society, which financially and numerically is exceedingly good. A prosperous future is anticipated. Several of the speakers congratulated the Society upon the many successes scored by its members at the various exhibitions, and an enjoyable evening terminated with the toast of "The President."

PHOTOGRAPHING LACE.—Mr. J. Perry, in an American contemporary, has the following remarks on this subject:—Recently the writer was called upon to photograph a number of patterns of beautiful samples of lace for an importer, who was anxious to secure the finest and most accurate representation of the originals, to serve as specimens for selection by his customers all over the country; and, as they would be examined in a very critical manner, more for their technical beauty than artistic, he was very anxious that they should set forth their peculiar virtues in the photograph. Each mesh of the lace consisted of cylindrical threads lying very close together. Now, we thought, if each of these threads is to be represented in the picture, it is necessary that they be distinguished from each other by light and shade So the problem resolved itself to conditions of proper illumination. If the lace patterns so constructed are photographed in full, broad light, they must of necessity be uniformly illuminated. The threads on the left will receive just as much light as those on the right, and hence all the cast shadows will be destroyed. There will be no relief. The threads will form homogeneous white lines, which will coalesce to form a monotonous white surface. I remember some previous experience which ought not to be expected of the professionals, and is therefore in justification of their failure. I had had considerable experience in microscopic photography where I encountered almost identical subjects, in which the character of the illumination, the angle of light, entirely altered the appearance of the objects. In determining the structure of minute forms of life, or death either, the microscopist is often puzzled to determine the actual structure. For instance, to be brief, some of the diatoms, magnified up to 900 diameters, exhibit a beaded appearance, which might be regarded as the real structure, as indeed it was so regarded for a long time, but this appearance was only an optical illusion produced by the illumination. The real structure, under illumination, showed as a network of hexagons instead of a surface of regularly arranged rows of hemispherical beads. The high tricks of illumination are indeed enough to make the photographer weep. So, remembering this fact, I arranged my specimens on a copying board, and placed it upright, and made my room rather dark, or rather, to speak more correctly, greatly subdued the illumination. The light came in from a narrow opening in the shutters, and was considerably to the side, the slit being about two and a half inches wide, the board, with the lace on it, at a distance of about four inches. Even to the vision, the effect of relief was plainly visible. Each individual thread was distinctly lined out most charmingly, and the picture had the appearance of the most delicate tracery in marble. The patterns were made as near actual size as possible, and the exposure of ten seconds, with a stop just large enough to give all the fine detail accurately. Of course, desiring vigour and contrast, all over-exposure must be avoided, the prolonged exposure in the case being due to the subdued illumination. In each case a trial plate can be readily made. If too much relief is given to the pattern, which may happen, as it did to me, increase the mouth of the opening, and, of course, shorten the exposure. The development needs no special instructions, except that, in aiming for contrast, do not overdo the matter by making the negative too harsh, remembering that the softness of the lace demands its consideration, and so keep from an excess of pyro; but here also a test plate will serve as a guide.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
15	Leytonstone	Excursion: Low Street, Essex. Leader, A. E. Bailey
15	South London	Excursion: Waltham Abbey. Leader, F. Sayers.
15	Wolverhampton	Excursion: Lilleshall Abbey. Leader, J. M. Taylor.
17	North Middlesex	*The Camera in the Field.* W. B. Goodwin.
17	Richmond	Annual General Meeting.
17	Southland	Open Night.
17	South London	*The Working of Novitas Paper.* O. Scholzig.
18	Aintree	*Chromazotype.* Mr. Brown.
18	Brixton and Clapham	*Carbon Printing.* Demonstration by the Autotype Company.
18	Gospel Oak	*The Advantages and Uses of Plate Backing.* W. E. Debenham.
18	Hackney	*The Erograph.* C. L. Burdick.
18	Leeds Photo. Society	Auction of Members' Photographic Apparatus, &c. G. H. Robinson.
18	Royal Photographic Society	*Notes on the Working of the Photo-aquatint Process, and on some of the Apparatus used.* T Huson, R.I.
19	Photographic Club	*The Spectroscope and its Application to Photography.* E. J. Wall.
20	Aston	Demonstration on Toning Gelatino-Chloride Prints. Messrs. F. Casson and Gadsby.
20	Bradford Camera Club	*Architectural Photography.* Walter Booth.
20	Goldsmiths' Institute	*Chemistry of Photography.* H. C. L. Bloxam.
20	London and Provincial	*Architectural Photography.* C. H. Oakden.
21	Munster	Prize Slides.
22	Aintree	Excursion: Wirral District. Leaders, Birkenhead Photographic Society.
22	Ashton-under-Lyne	Excursion: Windermere. Leader, Charles Lord.
23	South London	Excursion: Arundel. Leader, A. E. Allen.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 11,—Ordinary Meeting,—the Earl of Crawford, K.T., F.R.S. (President), in the chair.

ELECTION OF JUDGES.

The PRESIDENT announced the result of the election of Judges at the forthcoming Exhibition as follows, adding that out of a membership of upwards of 600, only about eighty ballot papers were sent in:—*Art Section:* Mr. B. W. Leader, A.R.A., Mr. W. Wyllie, A.R.A., Sir James Linton, P.R.I., Mr. G. A. Storey, A.R.A., and Mr. F. P. Cembrano. *Technical Section:* Captain W. de W. Abney, C.B., F.R.S., Mr. A. Pringle, and Mr. Chapman Jones, F.I.C., F.C.S.

ACETYLENE GAS.

Mr. HENRY J. ROGERS, M.I.M.E., of the Watford Engineering Works

described the manufacture of calcium carbide and the generation therefrom of acetylene gas, and showed his acetylene lamp for portraiture, and demonstrated its use. The lamp consisted of a parabolic reflector and nine burners, each capable of burning from half to one foot of gas per hour. Mr. Harold Baker took a photograph of the President by the aid of the apparatus.

Portraiture.

Mr. Harold Baker read a paper on *Portrait Work in the Studio*, and showed a fine series of lantern slides to illustrate the subject. He could not agree with Mr. H. P. Robinson that the depression hanging over the business of the portrait photographer was due to the revolt of the general public, who had become tired of the "usual thing," a happy phrase, as his own experience pointed in the opposite direction, and he was forced to the conclusion that the general public would have the "usual thing," and would not have anything else. In the provinces, at any rate, there was little or no demand for pictorial portrait photography, and his customers had made it a matter of complaint that his portraits were more like pictures than photographs. The use of rational printing methods with matt surfaces was only slowly advancing, and many sitters were only persuaded to take them by being told that they were the fashion, although the old Adam within them would prefer the shiny surface. With one or two exceptions, no professional photographer would dare exhibit in his show-cases what he would send to the Salon, and he knew of instances in which work which sitters refused to accept had been hung at the Salon, and received highly favourable criticism; but, if the public prefer the "usual thing," why should not the photographer supply it, and put money in his pocket at the same time? Yet perhaps even the professional might feel there was something to be sought after besides pounds, shillings, and pence. His studio was of the pattern usual twenty-five years ago, and with no blinds, as he preferred to get varied effects of lighting by placing the sitter in different parts of the room. He advocated short exposures, and could not understand why so many photographers clung with a fond affection to that barbarous relic of the dark ages called a head rest. The golden rule with regard to posing was to do none, or as little as possible, and an accessory should never be used if it could be left out. With children, very little posing was possible; it was more a question of patience, fast plates, and a quick eye for seizing a pretty pose. As a rule, there were no more delightful sitters than the children of people of good position, but sometimes they were, as Mr. Wilfer would say, "a little wearing." Few photographers realised the great difference that could be made in the lighting of the face by varying the strength of the background. In practice he gave a much longer exposure when using a white background than when using one of medium strength, the proper exposure for a head against a white ground being probably three times as long as the lighting with a black background.

Mr. R. W. Craigie joined issue with Mr. Baker upon the subject of length of exposure, and alluded to the fact that the late Mrs. Cameron gave exposures of from three to five minutes for her portraits of Lord Tennyson, Mr. Carlyle, &c. He had been using the Dallmeyer-Bergheim lens, and had got some very successful results with exposures of two or two and a half minutes, in which there was no difficulty if the sitter assumed an easy and natural pose, with the addition of a head rest, in the use of which he could see no disadvantage. With long exposures there was frequently a change of expression without movement, and this gave a sort of composite expression, which was very pleasing and lifelike; in portraiture there was practically nothing between a snap-shot and a prolonged exposure.

The Rev. F. C. Lambert, while agreeing that, with a reliable sitter, a long exposure gave very successful results, said he preferred something under two seconds. The artificial accessory was, fortunately, vanishing; but, at the same time, there was room for good work with real surroundings, and two or three professionals were doing excellent work in the line of "portraiture at home." He regarded the "usual thing" as the fault of the photographers of the past who created it; but, if men in the first rank would endeavour to elevate public taste, he thought the "usual thing" would soon become simply a matter of history.

Mr. T. Fall said the professional photographer had his rent, rates, taxes, and wages to pay, and must suit the taste of his customers. As to accessories, two of the most successful London photographers of to-day depended absolutely and entirely upon the lavish use of accessories, and most professionals would have to shut up shop if they abolished the head rest, or went in for long exposure. If he could select his sitters, as Mrs. Cameron did hers, it would not be difficult to make picturesque portraits; but what was to be done with a knock-kneed man who insisted upon being taken full length, and who, after having been carefully posed, walked across the studio to look at something towards which he had been asked to direct his eyes? Mr. Fall created a great deal of amusement by relating his experiences with the "knock-kneed man," and with an Irish lady of uncertain age and no superfluous good looks, who took from the studio table a portrait of Miss Maude Branscombe, and wanted "to look like that."

Mr. Percy Lancaster had found that the public appreciated platinotype and other matt-surface prints; he did not use a head rest once a year.

Mr. W. E. Debenham pointed out that a good deal depended upon what was meant by the "usual thing." He understood the phrase to mean good, sound photography, with the definition and gradations of nature truly rendered; if, however, the "usual thing" meant that flashiness and affectation which had to a certain extent been made popular, he could quite understand that the good sense of the public would have none of it, and that was why all photographers, with two or three exceptions, who were supported by faddists, had to continue to supply what he regarded as the "usual thing." Why did Mr. Baker look upon matt-surface printing as "rational?" Personally, he had no prejudice in favour of glossy or of matt surfaces; but, if either could be described as "rational," surely it was not the latter, which obscured or lost those details or gradations in the shadows which were fully rendered by a glossy paper.

Mr. Baker, replying, said, if he could give exposures of two or three minutes, he should probably do so; but, with ninety-nine sitters out of a hundred, it was impossible. The next best thing was to give a very short exposure, and, as far as possible, without allowing the sitter to know the actual moment, in which case a head rest was unnecessary. As to the loss some detail when printing on matt surfaces, he regarded that as an advantage for the negative often possessed more detail than was desirable for an artistic effect, and that was one reason why the Dallmeyer-Bergheim lens was valued by people who wished to produce pictures rather than portraits. He had for some time used collodio-chloride paper in preference to albumenised, and was convinced that a carefully prepared collodio-chloride print would bear exposure to light and damp better than any other kind of photographic print except carbon.

London and Provincial Photographic Association.

May 6,—Mr. A. L. Henderson in the chair.

Mr. P. Everitt referred to a discussion a few weeks ago with respect to certain negative, in which a white line ran round the edge of some building where they cut the sky. He showed a print in which this occurred, the subject being a mass of rock, and round the whole length of outline, where sky and rock met, ran the line in question. He ascribed it to the method of development, which in this case was prolonged, and said that, where strong contrasts occurred and the developer was allowed to stand still, the bromine liberated in development from the high lights, restrained the shadows in the immediate vicinity; if, on the other hand, the solution had been rocked, the bromine would be quickly dispersed, and have no effect.

The Chairman thought, in the present case, it must be called an accelerating action, and not a restraining one, and a discussion ensued.

Colour of Negatives.

Mr. S. Herbert Fry read a paper entitled,

The Colour of the Negative Deposit [see p. 313].

The Chairman agreed in the main with Mr. Fry's remarks. He himself went in for the grey or black and white rather than the yellow negative, for the reason that it was more difficult to judge the printing qualities of negatives of the latter type by the eye. He ventured to say that, out of 100 of the grey type, he would not fail more than once, but, with the yellow, he expected much trouble. Another point in connexion with yellow negatives was the fact that with continuous printing, the colour would surely bleach out. He saw an example of this in America. He was shown negatives of some Niagara pictures, and told that a year before the prints yielded were all that could be desired, while after that period a decent print it was impossible to secure. No matter how well a yellow negative printed at first, it was a mistake to make negatives of that colour, on account of the alteration to which they were subject.

Mr. J. E. Hodd invariably used pyrogallol, but never went in for the yellow type of negative, to which he had great objection. He liked those in which he could easily gauge the density and printing value. He found no difficulty in getting absolutely black and white negatives with pyro, which, to be a good developer, should be restrained as little as possible, and have just sufficient sulphite to keep clean.

Mr. Everitt recollected seeing a negative by Mr. Cobb years ago, which was typical of a yellow negative. It was of the interior of a circus, and the silver deposit in the negative was of a peculiar yellow colour, and the gelatine to a certain extent, was likewise stained. A negative of that kind gave very fine prints. One must be guided by the exposure to some extent. He believed in what was called a dirty negative if the plate had been under-exposed. The stain of the pyro did add considerably to the value of the image of the under-exposed negative. As regards the judging of the printing quality, it was a matter of experience only. There was something to be said on both sides. One was not so well able to judge of the intensity of the high lights in the negative with clear glass shadows as in the negative with a little yellow stain, and with the yellow negative perhaps it was difficult to value the shadows. He considered the eye better able to judge the density of the yellow image than that of the neutral tint.

Mr. A. Mackie said that there were two different ways in which negatives might be equally described as pyro-stained. In one the clear gelatine is stained by the developer, and in the other there is an organic deposit, in addition to the pure silver, and is itself coloured. It would not matter what colour the negative was if one always got the same colour and it was quite possible to judge of either. He observed that it was much easier to judge a wet-plate negative than a dry plate. He used what many would call an excess of sulphite with his pyro, mixing it with the pyro and with the ammonia solution, but he never got an absolutely black negative, but one of a greenish tint.

The Chairman remarked that, if a plate developed with pyro and ammonia were thoroughly washed before fixing, hardly any stain would be found. Some put them straight from developer to hypo, and there were, indeed, plates that would not stand intermediate washing.

Mr. Everitt added that a yellow negative gave better prints with albumenised paper than did the grey or blue negatives.

Mr. E. Banks spoke of the wet-plate negative, which, developed with iron, was distinctly of a yellow colour, and yet no finer prints, he suggested, were produced than those of these negatives.

Mr. Fry had expected more controversy than he had found. The time was not long ago, he said, when he would oppose everything he had written; but, from whatever motives, he was converted. It was more difficult to make equally good negatives in grey or black monochrome than in the highly coloured negative, and this deterred him from finally adopting that class of negative, owing to the difficulty of getting a really satisfactory transcription. With reference to clear glass shadows in a negative, he spoke against it; though, in theory, the tone that is to be the very lowest in the print might be clear glass, in practice there should be detail right down to the very deepest shadows, and no clear glass at all. As regards the use of sulphite with pyro, he thought the only satisfactory way was to make a simple acid solution of pyro and a separate solution of sulphite. Used in this way, one could get

ular colours, and could use little or much. As regards judging the negative, it was as easy with one colour as with another, provided one got uniformity of colour.

After some further remarks, a hearty vote of thanks was passed to Mr. Fry for his communication.

PHOTOGRAPHIC CLUB.

May 5,—Mr. Alexander Cowan in the chair.

The minutes were read and confirmed.

Mr. Thomas Fall introduced Mr. Reid, of Wishaw, to the meeting.

The HON. SECRETARY said the members were glad to welcome Mr. Reid. They had a lively recollection of his slides recently exhibited in that room.

A letter was read from Mr. Snowden Ward, having reference to the affairs of the Photographic Benevolent Association.

Tickets for the Sandell Exhibition were distributed.

TRADE NIGHT.

Mr. William Tylar, of Birmingham, showed the following useful novelties: A printing frame, the front of which was cut out of a solid piece of wood. The claim for this device is freedom from cross strain and less liability to break negatives in course of printing. A fixing trough of *papier-mâché* fitted with six separate dippers. The backs of the dippers are perforated, so that the plate can be examined without soiling the fingers. A bottle of dry-plate incurator. This aqueous solution is an alternative for varnishing, and is suitable for plates or films. It also serves as a medium for retouching, and makes the film waterproof.

Messrs. Sharp & Hitchmough exhibited the Aptus magazine hand camera. This camera is made to contain one dozen plates in sheaths. The sheaths are ejected after the manner made familiar by the Frena camera, and the method of changing consists in the alternative movements of a pin in the top of the camera. The changing device appeared to work well. The camera has a lens made of Jena glass working at *f*-10, and a good shutter. The instrument is well got up, and sells for 30*s*.

The Vanguard Manufacturing Company sent a full line of their specialities, which appeared attractively put up for sale. They are prepared under the personal supervision of Mr. Ethelbert Henry.

Mr. Snowden Ward sent an American hard rubber-grooved fixing bath. This article was made all in one piece, and appeared similar in composition to white. A useful adjunct.

Attention was drawn to an article in the *Strand Magazine*, written by Mr. R. Francis Nesbit, a son of one of the senior members of the Club. The article, which is accompanied by photographs taken by the author, illustrates the doings of the egg-eating snake. Mr. John Nesbit was congratulated upon his son's initial success in the combined arts of literature and photography.

Brixton and Clapham Camera Club.—May 4.—The Affiliation lecture, *Negative-making*, by Mr. Chapman Jones, F.I.C., F.C.S., F.R.P.S., was read by the SECRETARY, afterwards meeting with considerable discussion. On Tuesday, May 18, the Autotype Company will give a demonstration on *Carbon Printing*. Visitors will be welcome.

Hackney Photographic Society.—May 4, the President in the chair.—Excursion announcements were made by the EXCURSION SECRETARY. It was decided that the outing on Saturday, the 15th inst., should be to Buckhurst Hill, instead of Billericay, as previously arranged. Mr. C. H. OAKDEN gave a lecture on *Architectural Photography*, and treated the subject in a very complete and practical manner. A discussion followed, in which many members took part.

South London Photographic Society.—May 3, the President (Mr. F. W. Edwards, F.R.P.S.) in the chair. An address on

ARCHITECTURAL PHOTOGRAPHY

was given by Mr. C. H. OAKDEN, the Hon. Secretary. He said that that class of work could be dealt with either in a purely technical or an artistic manner, but, at the same time, there was no reason why the worker should not combine the two. The camera used should either be a square, or, if of the Kinnear form, one should be selected in which the bellows did not taper down to a small size in front. It should have a good rising front, and, if the bellows could be raised independently of the front, so much the better. It was convenient to have the focussing screen ruled in squares, as it assisted in adjusting the camera. The tripod must be firm and rigid, and, when used on a smooth stone or marble floor, the toes should be shod with cork or india-rubber to prevent them slipping. The ordinary rapid rectilinear lens had only a limited use in architectural work. Wide-angle lenses were the most useful, but care should be taken not to use one giving a wider angle than was absolutely necessary. A lens with a focus equal to the length of the plate often gave a much better result than one of shorter focus. The plates used should be rich in silver, and in many instances it was desirable to use isochromatic plates in order to get a better rendering of the subject. The plates should be backed. The length of exposure was determined by the colour of the subject and the colour and strength of the light admitted by the windows. In development, endeavour should be made to produce negatives thin in character, but yet sufficiently strong to produce prints yielding the proper gradation of light and shade. In selecting a subject, it was desirable to endeavour to ascertain the point from which the architect intended his work to be viewed, inasmuch as the best effect was obtained from that standpoint. It was sometimes a little difficult to ascertain this in cases where there had been alterations in the building and the older work was masked by some of later date. The effect of light and shade should be carefully watched, and, where there was of no object, a day spent in a cathedral, studying this, would be of great value when work was actually commenced. The remarks were illustrated by a large number of prints and lantern slides, which were individually referred to illustrate the various points under consideration.

Leeds Camera Club.—May 7.—The prizes in the print competition were given to the winning members, namely, the Rev. Mr. Beanland, Mr. Horner, and Mr. Middleton. This competition has not been very successful, there not being the number of prints sent in as was anticipated. The quality of the winning prints, both technically and pictorially, was excellent. The prizes for the next print competition were then considered, and the President (Mr. Burke) with his usual generosity, promised to give three prizes—a gold, a silver, and a bronze medal. There were also five other silver medals offered, three of them being by ordinary members of the Club. This should give an impetus to the photographic work of the Club, and fire the bosom of each member with enthusiasm for this delightful, health-giving, and instructive pastime. It was also decided to have two excursions a month during the summer season. The winners in the lantern-slide competition were also announced.

Sheffield Photographic Society.—May 4, the chair was occupied by Mr. Thomas Firth.—Mr. J. W. CHARLESWORTH gave a practical demonstration, subject, *Preparation of the Negative for Printing Purposes and General Work*. Although the demonstration was only intended to be of an elementary character, yet it proved highly interesting to the members present, the method of varnishing, reducing, spotting, &c., being plainly demonstrated.

Edinburgh Photographic Society.—May 5, Mr. F. P. Mollet in the chair.—A lecture on *Shakespeare's England* was delivered by Mr. J. G. PATTERSON. About eighty excellent slides of Warwickshire and Derbyshire scenery were shown to illustrate the paper.

Kilmarnock and Ayrshire Photographic Society.—The first outdoor meeting of the season was held on Saturday at Ness Glen. Although the weather was wet and dull in the morning, yet it turned out a beautiful day, and several excellent views were obtained.

FORTHCOMING EXHIBITION.

1897.

December 9–11 .....*Aintree Photographic Society.

* There will be an Open Class.

Patent News.

THE following applications for Patents were made between April 28 and May 5, 1897:—

ANIMATED PHOTOGRAPHS.—No. 10,310. "Improvements in Apparatus for Exhibiting Animated Photographs." R. W. PAUL.

CAMERA TRIPODS.—No. 10,531. "Improvements in Tripods or Stands for Supporting Photographic Cameras or the like." Communicated by F. A. Brownell. THE EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED.

ANIMATED PHOTOGRAPHS.—No. 10,603. "Improvements in Apparatus for Taking, Viewing, and Projecting Photographs of Moving Objects." Complete specification. B. ACRES.

DARK SLIDES.—No. 10,673. "Improvements in Photographic Dark Slides." T. W. BARBER.

LANTERN SLIDES.—No. 10,713. "Lantern Slides for Producing Drawing Effects and Representations of Real Life." J. GREEN, SEN., and J. GREEN, JUN.

ANIMATED PHOTOGRAPHS.—No. 10,734. "A New or Improved Apparatus for Producing Animated Pictures on the Stages of Theatres and the like." J. JEE.

AUTOMATIC PHOTOGRAPHIC MACHINES.—No. 10,906. "Improvements in Coin-freed Automatic Machines for the Taking and Delivering of Photographic Impressions." R. W. VINING.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Horace C. Messer, 29, Castle-street, Salisbury.—*Photograph of the Rev. George Short, B.A.*

Edmund Smith Baker, 154, Bristol-street, Birmingham.—*Two photographs of group of the Aston Villa Football Club, season 1896–7.*

Henry C. Spink, 109, Western-road, Brighton.—*Photograph of child, entitled "That Rogue Cupid." Photograph of child, entitled "The Warrior."*

John Kennerell, 7, York-row, Wisbech.—*Photograph of ceremony of laying the foundation-stone of the new Grammar School, Wisbech, on April 27, 1897, by the Lord Lieutenant of Cambridgeshire, Alexander Peckover, Esq., LL.D., F.S.A.*

G. E. NEEVES.—See last week's JOURNAL, page 290.

W. V.—It is not legal. We note your other remarks.

S. POWELL.—The photographs are very good; they are, however, somewhat flatly lighted.

CADETT SHUTTER.—E. P. This is, or was, we believe, made by Messrs. Marion & Co., Soho-square.

A PHOTOGRAPHER.—Received, and contents noted. Sorry we are unable to add anything to what we have already said on the subject.

LEVINO & CO.—A letter addressed to the care of Sir H. Trueman Wood, 9, John-street, Adelphi, will, doubtless, be forwarded to the gentleman.

R. W.—Consult Palaz's book on *Photometry*, where you will find several instruments described. If you cannot get access to the book, write us again.

INTERIORS.—THOS. ENGLIS. The cause of the windows at the chancel end looking as they do is halation. If the precaution had been taken of backing the plates, the halation would not have been present.

PYRO.—Register the design, also the photograph of it; this will probably make you perfectly safe. We take it that the original could also be registered, which would make you still more sure of your ground.

CHIPS.—You do not give us sufficient data upon which to advise you. Read the article on page 261 of the JOURNAL for April 23. This probably covers your case; if it does not, state the circumstances more fully for our information. Were you originally paid for the photographs? What was the consideration?

A. M. Z.—There has been occasional comment on the circumstance that the foreign system of marking the stop ratios appears to place the lenses of English make at a disadvantage. In the cases you cite you would probably be safe in computing your exposures by taking the aperture of the foreign lens as = *f*-9 (English).

DR. NEUMANN.—We have no recollection of the article referred to. Probably, by addressing Mr. R. B. Lodge, Enfield, Middlesex, England, or Messrs. Kearton, care of Messrs. Cassell & Co., Ludgate-hill, London, you may get the photographs you require. The gentlemen named have devoted much attention to this branch of work.

SPOTTY PRINTS.—W. Y. asks: "Will you kindly explain the cause of spots on the accompanying print? This is the second batch I have had like it."—Particles of foreign matter coming in contact with the prints, evidently due to perfunctory manipulation. Besides the spots, the print is but very imperfectly fixed.

COLOURING PHOTOGRAPHS.—LEOMINSTER asks: "Will you kindly inform me if there is any process of colouring photographs of flowers beside hand-painting them. If so, where could I get some done?"—We know of no method unless they are done mechanically by chromo-photography. If this will suit, Waterlow & Sons and others will execute the work.

PORTRAITS.—A. J. C. As you work in the open air, we do not see how you can stop out the sun, unless you convert the small back yard into a studio by covering it in with glass, or, extemporaneously, with canvas. As you use the place for professional work, would it not be best to build a proper studio on the top of the eight-feet high walls, and thus secure a side light?

VESSEL FOR ALUM.—CARBON. Zinc is no good for a solution of alum, as it would act upon the metal. Stoneware would answer very well; but, if you want a vessel of large size for alum solution, we should recommend you to have a stout wooden tray, lined with lead. "Four-pound lead," that is, a lead of the thickness that a square foot weighs four pounds, will be thick enough.

DISPOSAL OF NEGATIVES.—OWNER OF THOUSANDS. We do not know how you can more profitably dispose of old and spoilt negatives than breaking them up and getting the dustman to take them away. If you clear them off, no dry-plate maker will buy the glass, as they always use new, because now it is so cheap and more reliable than old glass would be. The larger sizes might be, possibly, utilised for glazing purposes?

FIXING.—J. & C. 1. As you apparently are, by the question, quite unacquainted with even elementary chemistry, we should recommend you to get which of the two salts you require from a respectable house. You will then ensure having the right thing. 2. Better keep to what the makers of the paper recommend. 3. We do not consider any toning bath that contains hyposulphite of soda, alum, nitrate of lead, &c., a desirable one to use. 4. No.

STUDIO.—FRANCIS OLIVER asks: "Can you kindly answer the following: Supposing a studio (with north light) built on the ground has a house, say, forty feet high, on north side of it, what space would be required between the house so that it may not interfere with the light at all? also would this be sufficient glass for a first-class light, three feet wood and then fourteen feet glass, coming down to three feet of floor?"—Place yourself at different distances from the house, and note at what distance from it no skylight is obstructed by it. Much nearer than that will make but little difference in actual working. Yes, the proportions will do very well, but a little more wood might be better.

PRINTS STICKING.—R. SMITH writes: "I enclose a photo-micrograph of a transverse section of wheat straw, and shall be glad if you can tell me how it is that I fail to get the prints off the slab without tearing? The slab is of gutta percha, polished, and I clean it very particularly. I am an old hand with the microscope, and I may say that the slab was microscopically clean when the enclosed stuck to it."—We have had no experience with slabs of gutta percha; but, if that material were used, we should expect that, by reason of its surface, the prints would stick. Substitute for the gutta percha ebonite, ferrotype plates, or glass treated with French chalk, and the difficulty will be overcome.

BLISTERS.—A. SLADE writes: "If not taking too much of your valuable spa could you tell me how to prevent blisters in ready-sensitised paper? have used both borax and acetate bath with same result, all soluti about same temperature. Have tried several brands of paper, but about the same. Was never troubled before with ———'s paper, I cannot get it now."—Immerse the prints, prior to washing out t nitrate of silver, in methylated alcohol, then wash, tone, and fix usual.

BACKGROUNDS.—PAINT POT says: "You would very much oblige us kindly replying to following query: In painting backgrounds for t trade (best and highest class), should they be done in oils or distempe If the former, should they be flatted after painting? Which is the be colour to use, and should the definition be sharp?"—They are do both ways. When in oils, they are always in flatting colour. Bla and white, warmed up with a little red. No, only such sharpness will appear artistic in the photograph. You had better, we think, g a few lessons from some one familiar with the work.

STUDIO.—W. ROSE says: "I am advised to write and ask you for a fe general hints respecting a studio and its lighting. I am thinking erecting one of about twenty feet by eight and a half feet, and should fe obliged if you could tell me what height or shape of roof would be be and proportion of glass, both top and side, and position of top light. think of having background at both ends. I have thought of a lean- or half span, so as to get more room for shelves, &c., on one side, al of having a door without glass midway in the lighted side, but don know whether it would spoil the lighting. By half span I mean this —A studio of these dimensions will be very small, if it is intended fe professional work. The shape of the roof, as shown in the sketch, wi do quite well. Four feet at either end opaque, and the rest, both sid and roof, glass. In so small a place a height of eleven feet at the rid and nine at the eaves will suffice.

BLISTERS AND SPOTS.—SIDNEY writes: "I shall be extremely obliged if yo can inform me the cause of our prints blistering, as enclosed sampl sent. We have tried salt in the washing-in water, and salt in the fir water after fixing; also methylated spirit, yet with the same result. notice that we get double the number of blistered prints when we get batch of paper that is thinner than usual. I enclose you two or three prints that have gone spotted, although they have had good washin and were put into bags and put on a shelf twelve months ago, and neve exposed to daylight at all. I enclose a *carte-de-visite* with some spot only mounted three days ago after two hours' washing and continu moving about in the apparatus. I should feel extremely thankful t you if you can enlighten me on these troubles."—Have you trie immersing the prints in methylated spirit as they are taken from th frames and prior to putting them in the water? That method c preventing blisters has never failed in our hands. Spots: If you, professional photographer, seeing the work produced, cannot accoun for the spots, we certainly cannot, beyond saying that they are due t faulty manipulation.

CINEMATOGRAPH FILM; GAS BAG.—PHOTOGEORGOS (Felanita de Mallorc Spain) says: "I would be grateful for your kind advice in the followin perplexities: 1. A considerable portion of an excellent cinematograp (several yards) has become detached from the celluloid, but otherwise in excellent condition; I think, with care, it can be reattached to th support, and is worth the trial; but what mordant would you advise and any hint how to set about the work would be welcome. 2. En closed is matter which has, so to say, peeled off from the interior of good gas bag, owing, as I suspect, to chlorous water from the purifie having been allowed to remain in the bag, or else from too little ca bonate of soda being used in the washing bottle. Enclosed is a portio of the surface which has peeled off from nearly the whole interior an which is rotten; and also enclosed is a piece of caoutchouc, whic underlies this (for I tore the bag open). I have a quantity of mast cated caoutchouc and good benzine, and I should be glad to have opinion whether it would be a practicable task to mend up this lar and costly gas bag, which is of English or Scotch make, the out surface being of buff twill. I trust you will kindly help, as you ha so often done."—We fear we cannot help in this case. 1. The on thing we can suggest as a cement is a mixture of acetic acid and alcoho 2. The rubber, as the sample sent shows, is perished, and there i no means of restoring it to its original state.

OBSTRUCTED LIGHT.—G. L. C. writes: "1. Could you advise me on the subjec of lights? I enclose rough sketch. My landlord wanted to enlarg his corner shop, both in depth and height, two stories, but has adde another one. He offered to make certain improvements to my place and give me an extra room in new building, offering to see that I dic not lose anything by it. Now, the job's been hanging about since Christmas, and not finished; but the question in point is whether I ca claim fair compensation for him blocking out my light? In the rough sketch you will see what I mean, as the new building quite takes al side light and a lot of top. I think, under the circumstances, I ought to raise studio higher, or turn it round and get a west light. But the chief point is, Have I got a clear case against him? If so, I shall go fo him. 2. Plates exposed to light. What is the treatment for same? I have about a dozen 20×16. I have seen somewhere that soaking in chromate of potash or some such treatment will restore them. Can you inform me of such?"—1. The sketch certainly shows that much of your light is obstructed; but we cannot say if you have any redress, inasmuch as you do not say how long your studio has been built. Unless it has stood for twenty years, it does not enjoy "ancient lights," and ther you have no redress; so it will be no use to "go for" for the landlord. Supposing you cannot claim ancient lights, you had better get the best you can from him. 2. A formula is given on page 979 of the ALMANAC for the treatment of fogged plates.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1933. Vol. XLIV.—MAY 21, 1897.

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EX CATHEDRÂ.

In connexion with the Diamond Jubilee, Messrs. Speaight, photographers, of Regent-street, have published a novel Congratulation Card. The design on the front contains a figure of Britannia, surrounded by emblems of the colonies, the whole surrounding the space reserved for one's portrait, which Messrs. Speaight take and mount on a dozen cards at a reasonable price. With each order they present a special copy for forwarding to the Queen on June 22.

* * *

Messrs. Fuerst Bros., of 17, Philpot-lane, E.C., the agents for Messrs. Lumière, of Lyons, announce that they have catalogued over 300 animated photograph film views prepared by Messrs. Lumière, which are now accessible to the public. These film views may be had either with the Lumière or the Edison perforation as may be required. The subjects of the views are very diversified—amusing, instructive, and interesting. Besides the general and comic series, there are numerous views, taken in all the European countries, of notable events and scenes, as well as a selection made from negatives obtained in America. An infinity of delight is included in this catalogue.

There is one point upon which Messrs. Lumière and their agents are to be congratulated, and that is, the exclusion from the catalogue of any subjects at all approaching riskiness of character. It has come to our knowledge that animated photographs of a by no means unobjectionable kind are available in certain quarters, but we trust that they will not be suffered to obtain currency in this country. One of the causes that led to the decline in public favour of stereoscopic photography is said to have been its abuse in the direction hinted at, and we are sure we have the concurrence of our readers in expressing the hope that the popularity of animated photography will not be menaced in a similar way.

* * *

Our contemporary, the *Tailor and Cutter*, appears to have sent a representative to the present Exhibition of the Royal Academy charged with the mission of criticising the portraits from the sartorial standpoint. The result is that some of the coats and waistcoats that have been painted come in for very adverse criticism by reason of their faulty construction—cut, fit, pockets, seams, flaps, collars, and all having been subjected to careful scrutiny and criticism. On the other hand, it is allowed that many of the portraits would even pass muster as fashion plates, "so faithfully have the details of seams, buttons, facings, and flaps been shown." Possibly, our contemporary may one day be led to visit a representative photographic exhibition, and give photographers the benefit of its advice as to how coats and waistcoats should "set" for photographic purposes.

* * *

We have already announced the registration of a company which is to be brought out for the purpose of exploiting "Radiotint," by which name the colour process of Messrs. Dansac & Chassagne is in future to be known. Our Transatlantic exchanges tell us that Messrs. Anthony, of New York, have taken up the process, and are shortly placing materials therefor on the market. The American newspapers speak very highly of the results, one going so far as to style the process a practical method of reproducing the colours of nature by purely photographic and chemical means.

* * *

Our readers are, of course, familiar with our opinion of the results, which is somewhat more qualified than the one we have just quoted. We have also (The British Journal of Pho-

TOGRAPHY, April 9 and 23), published both an analysis of the alleged method by which the results are obtained and the complete specification of the patent. *Wilson's Photographic Magazine,* in referring to those details, says :—

"We do not reprint these details here for two reasons. First: The inventors have not patented their method, nor will they do so. For obvious reasons the process, which has already been disposed of as far as France, Great Britain, and America are concerned, must remain the secret of those who have paid immense sums of money for it for commercial purposes. Hence we believe the alleged process, printed by our contemporaries, to be fiction. If it *is* taken from the specification of a patent, then our information leads us to conclude that it is not the process by which M. Chassagne produces his photographs in colours. Furthermore, the journals which have reprinted the alleged process comment upon two vital defects in their report, viz., that no mention is made of the preparation of the sensitive plates necessary to produce the pictures in colour; and, second, that the combinations which form the solutions are chemical impossibilities. We therefore refrain from wasting space on useless information."

* * *

THERE appears to be some doubt in the mind of our contemporary as to whether the details we have published were really taken from the specification of a patent. May we, then, say that we referred to the actual draft specification, deposited at the British Patent Office, which bears the names and addresses of Dr. Dansac and M. Chassagne, who were originally announced by Sir H. T. Wood as the inventors of the process he was the first to refer to in this country? We are quite prepared to be told that the results are not produced in accordance with the directions of the patent. The above statements that the actual method has not been patented; that it is to be worked as a secret process; and that the process described in the specification is a fiction, will, it is to be hoped, receive either the denial or the confirmation of M. Chassagne. Meanwhile, Sir Henry Wood informs us that he hopes shortly to be in possession of more definite evidence of the value of the process.

* * *

WE are reminded by a perusal of the obituary notice, in the *American Journal of Science,* of the late Mr. M. Carey Lea, that in our own obituary reference to the deceased gentleman we omitted mention of his investigations into the properties of what he designated the photo-salts of silver. In 1887 he published a paper on the "Identity of the photo-salts of silver with the material of the latent photographic image." His most remarkable discovery, however, made in 1889, was that silver is capable of existing in three allotropic states. The first is allotropic silver proper, "which is protean in its nature, may be soluble or insoluble in water, may be yellow, red, blue, or green, or may have almost any colour, but in all its insoluble varieties always exhibits plasticity; that is, if brushed in a pasty state upon a smooth surface, its particles dry in optical contact and with brilliant metallic lustre. It is chemically active." The second is intermediate in character, may be yellow or green, always shows metallic lustre, is never plastic, and is chemically indifferent. The third is ordinary silver.

* * *

IN a recent number of the *Scientific American* there is given the reproduction of a photograph of a deer taken at night by flashlight, the animal itself pressing the button. It is stated that the apparatus by which the deer was made to photograph itself was arranged by Mr. Charles Hughes, of Red Bluff, California, who conceived the idea of causing a wild animal to take a flashlight photograph as it passed along a trail in the Coast Range of mountains under the cover of night. He set up the camera a short distance from a trail over which the deer were known to run, and then connected the shutter and the flashlight materials with a trap. When the deer stepped upon the trap, the camera was opened and the flashlight set off at the same instant. Mr. Hughes thus secured the negative in the dead of night, and when there was not a soul within sight or hearing of the animal. On developing his negative, he found the photograph of a deer, which our contemporary reproduces. The frightened appearance of the deer, as he was startled by the sudden flash of light out of the darkness of the night, is clearly shown in the photograph. It was extremely fortunate that the deer should have stepped upon the trap, and thus have enabled this remarkable negative to be taken, but we do not know what has been gained by such a photographic curiosity.

* * *

LAST week, in our reference to the specimens of burnt-in photographs on enamelled iron that were shown us by the Photo-Enamel Company, we omitted the Company's address. The result has been our receipt of many queries on the subject. We may therefore state that the address of the Company is 88, Bishopsgate Street Within, E.C.

* * *

THE first statutory meeting of the shareholders of the Thornton-Pickard Manufacturing Company was held at the Company's office on May 10. Mr. J. E. Thornton, the Chairman, stated that the management of the business would be strengthened by the addition of Mr. G. A. Pickard, formerly one of the Directors, who had been appointed Managing Director in his late brother's stead. Mr. Pickard was a gentleman of considerable and varied business experience, and he (the Chairman) had no doubt that he would be for that reason of very great assistance to the firm. The whole of the issue of 20,000 five per cent. cumulative preference shares offered to the public was taken up immediately, and was, in fact, very much over-subscribed, the surplus having to be returned. Amongst the shareholders were many customers of the Company. Dealing with trading matters, he had pleasure in stating that the business of the Company was rapidly developing. The orders for shutters showed an increase of eleven per cent., and the orders for cameras an increase of 264 per cent.; consequently the sales for the four months which had elapsed since the Company had taken over the business showed a very considerable increase over the corresponding period of last year. The "Amber" camera, which had only been introduced a few months ago, had already attained a large sale. The Directors were doing all in their power to cope with the increased trade by the addition of new machinery and other facilities, and by a largely increased staff of *employés.* In conclusion, he said that the prospects of the Company were very promising indeed, and he had every confidence that the business would prove as successful in the future as it had done in the past.

* * *

AT the St. Bride's Institute, Fleet street, E.C., Messrs. Hare & Co. have arranged an Exhibition of posters, the work of Mr. Louis J. Rhead. The object of the Exhibition is to give advertisers the opportunity of selecting posters suitable

or drawing attention to their manufactures. Mr. Rhead's versatility takes a wide range, and he appears to be endowed with sufficient inspiration to enable him to design posters suitable alike for advertising pianos, bicycles, newspapers, pickles, ladies' toilet requisites, lamps, ardent spirits, boots, and numerous other articles of commerce. The posters shown are effective in colouring and design, and, here and there, touch a level of artistic excellence almost too high for the street hoarding.

IS SILVER PRINTING IMPROVING?

EARLY in the year, in an article, *A Retrospect and a Query*, the question was raised as to whether the advancement of photography, so far as results are concerned, had been, during the last thirty years or so, really commensurate with the increased facilities afforded during that period for obtaining them? The same query will probably suggest itself to many when visiting the Photographic Section of the Imperial Victorian Exhibition at the Crystal Palace. Particularly, we surmise, will this be the case with regard to the permanence of silver prints. The stability of our pictures is—or ought to be—an important item in considering the advancement of photography.

It is true that we have processes, other than silver, which will yield results that are permanent, to all intents and purposes—carbon, platinotype, and the mechanical processes, to wit; but, for ordinary every-day work, silver printing still rules supreme, and, in all probability, will continue to do so for a long time to come. Seeing that, one is naturally led to inquire if any real advancement has, or has not, been made in the direction of permanence in our silver prints, or whether there has not been rather a retrogression, even to such an extent that many of the general public have been led to imagine that photographs must necessarily fade after a life of only a few years. Some modern photographers also seem to subscribe to the opinion that, if the prints last for four or five years, that is all that can be expected. Is this creditable to modern photography in the face of so much of the work of earlier days?

Are silver prints necessarily fugitive? The fact that prints are now in existence thirty or forty years old, which show but little change, some none at all, would seem to negative that idea; for, if but one print in 10,000 proves permanent, it may be accepted as evidence that, if the other 9,999 had been dealt with in the same way as that one was, they would have been equally as stable; therefore one may naturally ask why they were not? It used to be said that the fading was due to the silver forming a compound with the albumen, which was liable to decomposition; but the fact remains that prints which have withstood the test of time for thirty years or more are prints on albumenised paper. The excellent large direct pictures, by Mr. Osmond R. Green, at the Crystal Palace, to which we referred last week, were printed in 1867, and only one of them shows a noticeable sign of change; and they are on albumen paper, and, from their size, it might be imagined that they did not receive that thorough fixing and washing that smaller ones would have received.

There are in the Exhibition some collodio-chloride pictures, by Mr. G. Bruce, of Duns, that were made over a quarter of a century ago, that show no change whatever, and we are told they have been hanging in his reception room from the time they were produced until they were sent to the Exhibition. Here we have the stubborn fact, that silver prints can be, and have been, made that are to all intents and purposes permanent, and made too when less was known about the chemistry of the subject than is supposed to be the case now.

Here is another point in connexion with the advancement of photography as relates to stability. Has gelatine conduced to the permanence of silver prints? When it was introduced, it was predicted that it would; but has that prediction been fulfilled? We opine not, and that there is in existence as large a proportion of deteriorated gelatine prints, made within the past few years, as there are albumen ones produced during the same period, if not, indeed, a larger. Is this due to the material or the manipulation, for by this time we ought to be aware?

One other point in connexion with the evanescence of silver prints is that, when they are fading, there is no known way of arresting it, nor is there any satisfactory method of restoring them to their pristine state as there is with "faded" Daguerreotypes, the oldest process of all. One would almost have thought that, with our advanced knowledge of the chemistry of the subject, there should be, inasmuch as the substance that once formed the image is still in the paper, though in an altered condition, for there is no reason to surmise that it has become volatilised.

In view of the facts before us, it may well be asked whether silver printing has made the great progress, either as regards permanence or excellence of results, during the past three or four decades that might have been expected? Many of the prints made thirty years ago faded, and the majority of those made now do the same.

A New Waterproof Paper.—According to an American paper, a new waterproof paper which, if all that is claimed for it prove to be true, should be very useful for many photographic purposes, has been invented by Mr. A. F. Newman, of New York City. He is stated to have made a series of successful experiments on a manufacturing scale at the Rock City Paper Company's works. The Newman paper is waterproof and is capable of being washed, the only effect of water being to toughen it. One of the purposes it can be put to is the lining of oil tanks, and it is stated that an oil company has contracted for a large quantity for this purpose, special machinery for making it being in course of erection at these works. So far the process is a secret one.

Suppression of Flickering and Scintillations in the Cinematograph.—*La Nature* describes a method of preventing the well-known light-shooting and flickering that this instrument is liable to. M. Gaumont states that the flickering can be nearly avoided by first-class construction in the apparatus, but that the scintillation is scarcely possible to be remedied by such means. He finds, however, that, with very little loss of light, it is overcome by observing the picture on the sheet through an open network or perforated screen. To carry this idea out effectively, he has devised the plan of supplying each spectator with a neat little fan, through which he may observe the picture while gently waving the fan to and fro or from side to side. Another method is to interpose between audience and stage a light, perforated screen, kept gently oscillating during the time the pictures are displayed. M. Mareschal, who describes this invention, says, "The form of a fan is happily chosen; the price is so small that they may be distributed gratis to the audience, the cost being recouped by the charge for advertisements printed upon them. They will be for the future the indispensable accompaniment of every exhibition of animated photographs." (See p. 316 *ante*.)

The Oxy-ether Light and the Cinematograph.—Our contemporary, above named, has a short article referring to this subject in connexion with the awful catastrophe in Paris. Speaking

of this light, which it alludes to as being in so sinister a manner the topic of the day, one specimen of it having caused the horrible drama of the Bazar de la Charité: "They are used when gas is not convenient. The vapour of ether replaces hydrogen, and its combustion with oxygen produces a brilliant light. They are often used for photographic lantern projection. Our fellow-worker, M. G. Mareschal, who uses these lamps extensively, remarks that they are now constructed in such a way as to ensure all desirable safety. Still danger does exist. The ether to be mixed with oxygen is enclosed in an hermetically sealed receiver, and poured upon some spongy material—pumice stone or felt. When the lamp is first used, the exact quantity of ether needed is known, but afterwards it is added in a hap-hazard way, and, if too much be added, the receiver is filled with vapour at ordinary pressure. If care be not taken to empty any overplus of liquid after having opened the oxygen tap, and a light be applied after opening the receiver tap, ether spray is ejected, and gives rise to a flame over a yard in length. That the fire in the Rue Jean-Goujon occurred in this or a similar manner is possible, though it could not be justly asserted that this was the cause. In any case it is well to warn users of these lamps of the necessity of taking care to avoid any excess of ether in the receiver it is poured into."

The Use of a Portrait Lens in Astronomical Photography.—In a long article on this subject in a recent issue of *Nature*, Herr Max Wolf explains the great usefulness of a portrait lens as against a reflector for many kinds of astronomical photography. Thus, for example, he says, "the portrait lens is much superior to the reflector for the work of seeking a charting feeble and extended nebulosities. The lens takes a much larger field of sky than the mirror. This is known to be the reason why the portrait lens should be used exclusively for the photography of minor planets, of comets, for making charts, &c. With very feeble impressions on the plate, he reinforces them by duplicating the negative by a transparency and second negative, thus being able to get denser negatives. Slow plates, over-exposure, and slow developing should be the system adopted. Another method of examining a faint plate is to put it in a printing frame with a smooth piece of white paper backing, and to view it in the sunlight." Herr Wolf writes: "The weak point in photographing stars and nebulæ is not in the instrument, it is in the plate. . . . . I made several dozens of exposures of the Pleiades, some of twelve hours' exposure, containing beautiful nebulosities, but no one plate has been sufficient. All of them show, besides the true nebulosities, more or less artificial nebulæ. . . . . Thus we need a large number of plates to show the true nebulosities." Now we may point out to Herr Wolf a very simple plan whereby we believe that with two plates of one subject the "artificial" nebulæ or stars, *i.e.*, spots and marks, could be detected in a moment without the trouble of making elaborate individual comparisons. If the two plates were placed side by side and viewed in a stereoscope, the spots which were not duplicated would reveal themselves at once.

BY THE WAY.

We—and in that little pronoun I include the world generally—like variety in our pleasures as well as our grievances, in fact variety is as essential as the original pleasures or grievances themselves, which would otherwise cease to be. It consequently happens that the evergreen "amateur" question is in abeyance for the nonce, and, even the "poor chemist" shines only by the reflected light of his "dealing" side, for, lo and behold! the professional photographer is wroth with the plate-maker. I have nothing to say against plate-makers as a body, except that some of them have made fortunes in what seems to be an extremely rapid fashion, but in their favour it is to be said that they save us—I mean photographers generally—a world of trouble and worry in the preparation of our plates, and, as a rule, supply an article that is far superior to anything that the ordinary every-day photographer, amateur or professional, could turn out for himself; and I fail to see why the plate-maker should be boycotted because he chooses to carry on his business in the way he prefers, and which seems to me to be the proper and businesslike way.

The grievance is that the principal plate-makers have agreed, in future, to adhere to certain terms and conditions in their dealings with the general public—in which dealers, professionals, and amateurs are included—and in these new arrangements the professional photographer is placed in a different category, as he properly should be, from the photographic dealer. Now, without going into the "ethics" of such matters, I cannot, for the life of me, see why all professional photographers should be placed in a position to claim a preferential discount because *some* of their body use more plates in the year than *some* dealers sell.

It appears to me that very large consumers, by virtue of proportionate discounts, will be able to buy just as well as ordinary dealers, and better than small users; if they can buy on better terms than ordinary dealers, or on as good terms as large dealers, then I say it is not right; and this appears to be not only the view taken by the "ring" of plate-makers, but, if matters were investigated, it would turn out that the shoe only, or chiefly, pinches the same class of professional that complains so loudly about the interference of the amateur with his business—the class, in fact, who, by simply printing "dealer in photographic chemicals" upon his note-heading or trade card, has been in the habit of hitherto securing his few dozen plates per annum direct from the maker at wholesale prices. The grievance, if any, appears to me to have been entirely the other way about, and the action of the "ring" is calculated to put an end to it, for the small-dealing professional is as much an anomaly as the photo-dealing pharmaceutical chemist.

But there is one question I should like to ask those professional photographers who complain so loudly about the "new" arrangement, and I shall be deeply interested in reading their honest replies. When, some few years ago, certain firms formed a "ring" in favour of professionals, and agreed to supply their goods to, and execute work for, professional photographers only, does the professional photographer consider that he then occupied any different position to that filled by the dealer now in the plate "ring," or that the amateur of that day had any less ground for complaint than the professional of now? Yet we did not find the professional then loud in his vituperation of the members of the "ring," nor was the atmosphere full of sounds and threats of boycott.

Where, oh, where is now that "ring?" Apparently the support of the average small professional, even when they "come in their thousands," does not pay, or, at least, is not worth cultivating, to the entire exclusion of the contemned amateur, for more than one "link" of that bygone ring now caters largely for the amateur element, to my certain knowledge—would be foolish, indeed, if they declined to do so. There is this advantage about the modern amateur, though he may have faults in other directions, he does not dictate his terms; and, if he does like his things cheap, he is numerous enough to make it pay to cater for him. I am sorry to say I cannot turn to the denouncers of the plate ring and give them the *Tu quoque*.

Speaking of modern amateurs reminds me that last week's Journal contains allusions to two of that class, whose records date back many years. Mr. M. Carey Lea, whose death I was sorry to find recorded, although he had passed the usual limit of three score and ten, was formerly almost *the* most regular contributor to the Journal, including even the Editor, but certainly the most prolific. In fact, in the very early days of his connexion with photography, as American correspondent of this Journal, and before his name was really known, his very voluminous contributions gave rise to the idea that the name was an assumed one under which several different individuals wrote. Then, again, the extraordinary range of subjects on which he wrote was, and is, a surprise to many, but it need not be if it only be considered that Mr. M. Carey Lea was an amateur photographer with leisure, a very large portion of which he devoted to the science in the days when the photographer had to work a good deal harder than he has now, and was compelled to

perform tasks that he would never dream of tackling to-day. He was, in fact, constantly at work *at something*, and his writings were but the reflections of his daily practice.

The other instance is found in the report of the Photographic Section of the Victorian Loan Exhibition at the Crystal Palace, where are to be found pictures on dry plates, twenty-four inches by eighteen, taken direct twenty years ago by Mr. Osmond R. Green, another amateur, *upon plates prepared by himself*. Think of that, some of you modern amateurs and hand-camera workers, and reflect that, even at modern "popular" prices, it would cost you over half a crown for the same area of sensitive surface as *one* of those plates contained. But the modern man does a lot of self-patting on the back when he gets a fairly successful result on a quarter-plate he bought. Truly, in the language of the Editor of one of your contemporaries, "which of us amateurs would have been photographers in those days?" Proportionately, not many.

Yes, things were very different "in those days," not only in regard to the amount of work that fell upon the photographer as compared with to-day, but also in the cost of everything, in spite of the extra work. Then, in connexion with these very pictures of Mr. Green, I was told some years ago by my friend, Traill Taylor, I think, that, reckoning up the cost of a year's work, these negatives cost him a trifle over ten guineas a piece! But much might be said on the comparative cost of then and now.

DOGBERRY.

FOREIGN NEWS AND NOTES.

Quick Developers.—Professor Lainer gives an account of some experiments in this direction in the *Photographische Correspondenz*. In 1891 he gave some formulæ for hydroquinone and caustic soda, with addition of ferrocyanide of potash as accelerator. The special advantages were the highly efficient use of the hydroquinone and the energy of development, unsurpassed by any other method. Since then metol has been placed on the market, and is to be recommended where shadow detail is required with short exposure. But neither metol, nor any other rapid developer, should be used when the exposure is unknown. For portraiture in the studio, where the exposure may be measured with nicety, metol may be used to full advantage. The rapid hydroquinone developer is, however, in no way inferior to it. With some plates there may be a tendency to frill, in consequence of the presence of caustic alkali, but its accommodation to exposure by dilution or the addition of bromide of potash are of value. Formula No. 3, given in 1891, was composed as follows:—

Solution A.

Water	1000 c. c.
Sulphite of soda	30 grammes.
Ferrocyanide of potash	90 „
Hydroquinone	10 „

Solution B.

Water	600 c. c.
Caustic soda	200 grammes.

For use, take 60 c. c. of A, 8 c. c. of B, and add 3 c. c. of a one per cent. solution of bromide of potash.

Development is complete in one to two minutes, or, if diluted with an equal quantity of water, three minutes will suffice. The developer is easily adjusted to different kinds of plates. With less caustic soda the negative is more brilliant and development slower. With more caustic soda the contrasts are less, and this may be increased until, with double the quantity, an absolutely flat negative is obtained. Sufficient solution must be used to avoid yellow stain, and for the same reason development must not be prolonged. To check further action, place the negative in a one per cent. solution of hydrochloric acid. Fix in a ten per cent acid sulphite fixing bath. Yellow negatives may be cleared with ferridcyanide of potash, one gramme to 900 c. c. of water. Rewash, and fix in a ten per cent. bath

Reversed Negatives.—Professor Lainer, in the same periodical, gives the following particulars of a method for stripping gelatine plates. Having made some experiments with an addition of formalin to the above-mentioned hydroquinone developer, and noticed that the films were easily lifted, the use of formalin and caustic soda for stripping seemed probably useful. The following solutions were prepared:—

A. Water	200 c. c.
Solution of caustic soda (1 : 3)	10 to 15 c. c.
Formalin	4 c. c.
B. Water	300 c. c.
Hydrochloric acid	10 to 15 c. c.

Some old, unvarnished negatives were soaked in A for about five minutes, and, after rinsing, transferred to B. After soaking five or ten minutes, the film is loosened at either of the narrow sides of the plate with the fingers, carefully avoiding the least tear. If this should happen, begin again at the opposite end of the plate. When the film is loosened and turned over for the breadth of a centimetre, it may be stripped without further trouble. The film is turned over in the bath and adjusted to the plate, held by the upper corners and withdrawn from the bath. The plate is then stood up to dry, and after a short time blotted with filter paper to remove any drops of water that might cause blisters. Further practice will show if it is necessary to use plates coated with gelatine for the transfer, or if it is sufficient to secure the edges of the plates and films with a solution of gelatine. As there is very little enlargement of the film, sometimes scarcely any, the process might be used by photographers to make companion pictures in opposite position.

Washing after Fixing.—In the *Photographisches Wochenblatt*, Herr Gaedicke gives particulars of a series of interesting experiments. The plates were rinsed after fixing, and then washed by means of several changes of water at intervals of five minutes, the dish being rocked occasionally. The plates were 12 × 16, and 100 c. c. of water were used at each change. The amount of hyposulphite of soda taken up by each change of water was ascertained volumetrically, with a solution of 5·12 grammes of iodine and 15 grammes of iodide of potassium dissolved in 1 litre of water. 1 c. c. of this solution will decompose 1 milligramme of hyposulphite of soda. The following are the results of two series of experiments, one made in the laboratory and the other at a meeting of the Deutsche Gesellschaft von Freunden der Photographie, Berlin:—

	Iodine Solution used.	Hyposulphite of Soda. Laboratory Experiments.	Hyposulphite of Soda. Public Demonstrations.
1st wash water	16·5 c. c.	0·165 grammes	0·336 grammes.
2nd „	2·5 „	0·025 „	0·050 „
3rd „	10·5 „	0·005 „	0·008 „
4th „	0·1 „	0·001 „	0·001 „
5th „	0·05 „	0·000 „	0·0005 „
6th „	0·00 „	0·000 „	0·000 „

The plate was washed film upwards; but, if inverted or upright, elimination would, of course, be more rapid. It may therefore be assumed that a plate with a thin film is thoroughly washed by five to six changes of water at intervals of not more than five minutes. A plate thus washed was intensified with bichloride of mercury. The deposit was blue-black, with clear shadows, and without any trace of brown indicating the presence of hyposulphite of soda.

Physical Intensification of Gelatine Plates.—Herr Gaedicke states, in answer to a correspondent, that, in using the formula quoted on page 264 of THE BRITISH JOURNAL OF PHOTOGRAPHY, it is better to dilute 2 c. c. rodinal with 60 c. c. water, and, lastly, add 6 c. c. of the intensification solution. The deposition of the silver is thus retarded, and more is deposited on the negatives and less precipitated in the fluid.

Formalin as a Disinfectant.—We read, in the *Photographische Mittheilungen*, that Dr. Haefke has drawn attention to the use of formalin as a disinfectant. It is as powerful as bichloride of mercury for this purpose, and less dangerous. The workmen at Schering's factory, who are occupied in the preparation of Formaldehyde, enjoy good health. Formaldehyde is even superior to bichloride of mercury, as it does not fail with solutions containing albumen. It is also useful for the preservation of articles that suffer by exposure to damp, such as leather, books, &c. A suit of men's clothes may be completely disinfected with 30 grammes of formalin. Formaldehyde may be used as a fluid or as vapour, and it is very penetrating.

Amateur and Professional.—The *Deutsche Photographen Zeitung*, a professional paper, has a timely article on this subject. It appears that some photographers in Germany are agitating for a law prohibiting amateurs from taking photographs for payment; but the writer points out that other agitations might follow, in the interest of the frame-makers and others, prohibiting the photographer from interfering with their trades. After pointing out that the profession has benefited largely from the discoveries of amateurs and the cheapening of prices of material, for which they have set up a large demand, the writer ascribes the fall in remuneration rather to the multiplication of studios. In many places there were not half as many photographers five or ten years ago, and how many of these studios are merely schools for apprentices! Moreover, does the principal always know his profession? The writer quotes an incident where an apprentice asked his principal, "What is waterglass?" "Waterglass—well, waterglass—waterglass consists of—of spirit and something else." This is not instruction, and the photographer would do well to promote technical schools of photography, and so to do his work that its superiority should place him beyond fear of competition from amateurs.

The Reward of Science.—M. Ducos du Hauron, who has done so much for the advancement of three-colour work, and was one of the first, if not the first, to turn out three-colour prints by any method, is in somewhat straitened circumstances, and the *Photo-Revue* has opened a subscription list for him. To be a successful inventor is not the only thing; one evidently wants to be a successful man of business as well, and be exploited by some of the leading authorities in order to make one's invention successful from the monetary point of view.

Improving Negatives.—Precht suggests the following methods of improving negatives with normal high lights and foggy shadows: Soak the plate in water and immerse in a mixture of one part ten per cent. solution of red prussiate of potash and five parts of hypo solution. This clears up the shadows much more than the high lights, and, after washing and drying, the negative should be intensified with bromide of copper and silver nitrate. If the high lights are too weak, and the shadows fogged, the negative should be first intensified with the copper and silver nitrate, and then reduced in the normal reducer. The colour of the negative is changed from blue-black to a yellowish-brown. The advantage of these methods is that both may be repeated, and the contrasts considerably increased.

THE FORTHCOMING EXHIBITION AT THE CRYSTAL PALACE.

In accordance with notice previously given, the meeting was held at 12, Hanover-square, on May 11, 1897, the Right Hon. the Earl of Crawford, K.T., F.R.S. in the chair.

Mr. T. R. Dallmeyer said that, as might be inferred from the circular, the Committee had held several meetings with a view to inaugurating a trade and technical Exhibition, under the auspices of the Royal Photographic Society. He felt that one of such a character, carried out by the Society, and not by one or two persons with their individual interests to serve, was one to be supported by the entire trade. Such an Exhibition, held in a building of suitable size and one in which there would be no interference with those appointed to carry it out, would, in his opinion, be a unique opportunity for the display of photographic industry in all its branches, and should lead to as considerable an increase in the popularity of photography as the large cycle exhibitions have undoubtedly done in their own sphere. If this present opportunity was embraced by the trade, and was gone into with a determination to make it a really good show and compel the attention of the public, it should be in every way a success.

Letters were read from a large number of firms, the great majority of which was strongly in favour of the proposed Exhibition, one letter only opposing it and one firm stating their rule that they never exhibited at any exhibitions.

The Earl of Crawford, referring to one of the letters that had just been read, in which the writer said it was not in his opinion the function of the Photographic Society, said that anything the Society could do to further the interests of photography and of those who gained a livelihood by it was clearly its duty to do. He regretted that he laboured under the disadvantage of having been away from England during the preliminary negotiations, and there were therefore gentlemen present who were better acquainted with them. The Crystal Palace authorities had made proposals which would save the exhibitors much of the trouble and expense they would be put to in any other building. No guarantee of any kind would be required, the charges already announced covering all the exhibitor's liability towards the expenses of the Exhibition, each exhibitor, of course, having to fit up his own exhibition. To put the matter in order, he moved from the chair that a Trade and Technical Exhibition, as suggested in the circular, shall be held at the Crystal Palace next spring.

This was seconded by Mr. Frank Bishop, who said he thought the first thing to do would be to ascertain how many of those present were willing to exhibit.

Mr. Conrad Beck thought that there would be very little difficulty in getting the adhesion of practically the entire trade, if they could be convinced that the Exhibition would be thoroughly well supported, and that those present who were prepared to exhibit should pledge themselves to do so.

The following firms thereupon, either personally or by letter, stated their intention of exhibiting:—Messrs. Adams & Co., Messrs. R. & J. Beck, Limited, The Blackfriars Photographic Co., Messrs. J. H. Dallmeyer, Limited, Messrs. Dollond & Co., Messrs. Elliott & Fry, Messrs. Elliott & Son, The "Gem" Dry Plate Co., Messrs. Houghton & Son, Messrs. Marion & Co., Messrs. Mawson & Swan, *The Photogram*, Limited, The Platinotype Co., The Sandell Works, Limited, Messrs. J. F. Shew & Co., Messrs. Talbot & Eamer.

Mr. H. Snowden Ward said he had seen Mr. Houghton, who was, unfortunately, unable to be present, and who said that, were the trade anything like unanimous, the Exhibition would have his support.

Mr. T. R. Dallmeyer drew attention to the fact that, in addition to these definite promises, there were a large number of letters also in favour of the scheme.

Mr. Frank Bishop expressed the hope that professional photographers would not be left out in the cold; and it was pointed out that it had been thought best to allow the profession to meet separately and elect representatives of their own.

A discussion then ensued upon the most convenient time and date, and it was finally agreed unanimously that the period stated—April 20 to May 14—should be shortened by one week, and that the Exhibition should be open from April 27 to May 14 only.

The Chairman said the meeting had been invited to elect delegates; but, in view of the fact that a large number of the trade had, apparently, been unable to be present, and had only communicated their views by letter, it was suggested that a second meeting should be called at a more generally convenient hour for the purpose.

Further discussion elicited the opinion that the trade representatives should constitute one half of the Managing Committee. An impression had got abroad that the three delegates they were invited to elect might be swamped by the other members of the Committee.

The Chairman pointed out that on the existing Committee, which, however, had now finished its work as far as this Exhibition was concerned, and which was of a preliminary nature only, the trade were directly represented by six members out of fifteen. The Exhibition Committee, however, was not yet appointed.

Mr. Winter emphasised the importance of having the trade well represented on the Committee, and the Chairman promised to lay the views of the meeting before the Council of the Royal Photographic Society.

The question whether awards should be given or not was deferred. A short discussion took place, in which opinion was very strongly in favour of making the Exhibition as comprehensive as possible, including both amateur and professional work.

It was decided to adjourn the meeting until such time as the Secretary had seen certain firms who were not there represented, and that, when that was done, the trade should be called together again, if possible about 6 p.m.

The meeting then adjourned.

A FIRST-CLASS REFERENCE.

On reading down the advertisement columns of the Journal, under "Situations Wanted" the phrase "first-class references" frequently occurs, the general possession of these credentials by those seeking engagements, seeming to indicate no lack of the competent assistants photographic employers desire, yet complain that they cannot obtain. It is assumed that the assistant who can show first-class references has given sufficient proof of his skill and ability, although the grounds for the assumption are not clear, and daily experience proves it to be false. The precise value of a reference is hard to define, and it is difficult to say in what manner it establishes the character of an assistant and his skill as a photographer.

The reference question is so intimately related to the efficiency of assistants and the commercial condition of photography, that, perhaps, it will not be without interest to ask, and attempt to answer, the following questions:—What is a first-class reference? What qualities should the assistant possess to be entitled to one? Of what value is a reference as a proof of merit?

The value of testimony of any kind must depend on the knowledge of the person who gives it, and, usually, it is the ignorant employer who supplies the most eulogistic references. For instance, a photographer of not more than twelve months' standing gave the following terms in a testimonial:—"There are few men better instructed in every branch of photographic work." Evidently such a description could only apply to a

man of experience and some years of training; but, when I explain that it was given to a bumptious youth just out of his apprenticeship, having a smattering of processes gained at a photographic class, the value of the testimony is somewhat discounted. The employer who wrote it could scarcely develop a plate, and the man "instructed in every branch of photographic work" could produce a fair batch of silver prints, and make an average negative. The reference was first class, but no proof of merit in the holder, only of ignorance in the employer.

Cases like the above have deceived many employers, and consequently there exists considerable difference of opinion regarding references based on individual experience, some depending simply on a written statement to engage a man from a long distance, whilst others rely on personal appearance, the tone of a letter, and minor things in forming a decision. The sceptical employer insists that references are valueless, being chiefly used as a polite method of dismissing a "duffer;" that is, an employer, finding he has engaged a worthless assistant, discharges him, and, to soften the blow, writes him out a first-class reference. The "duffer" departs, not displeased, for he has added one more first-class reference to his stock. This practice keeps in the profession many of the incompetent, who by the aid of testimonials linger on, imposing on many employers merely by reason of the names of the men on the characters they show. Every employer could probably give examples of worthless assistants having many references from the best firms, obtained through the kindness of those who gave them a trial, and dismissed them with a written character.

Practically, little reliance can be put upon these written statements, which depend for their truth quite as much on those who give them as upon the abilities of the holders. No reference from one employer to another is of real value unless the conditions are exactly the same. Methods of working vary so much, that assistants who do well under one employer are quite at a loss when put under fresh conditions.

Reference-giving is merely a survival of the boarding-in system. The assistant, when taken into the family of his employer, becomes so closely connected that the employer requires some safeguard that he shall be sober, regular, and of decent conduct. In occupations that do not follow the custom of paying wages in board and lodgings the only test applied for a man's capacity to fill a post is the practical one of being able to do the work. He is shown the materials, given the tools, and left to work. If he can do the work, he is engaged; if not, he must at once make room for a better man. This is sharp practice, but it effectually weeds out the incompetent in a short time. A month or six weeks may be wanted to fairly test a man, but a safe estimate can be made in a day.

Actually, putting a man to work is the only real test, and, however much an employer may value references, or however first-class they may be, in the end he determines a man's fitness by the practical test.

References are therefore superfluous, and cannot be relied on as a measure of the capabilities of an assistant. Being useless, and harmless, why not let the matter rest? Because they stand in the way of applying a more efficient test, and are detrimental to progress in photographic knowledge. Under the reference system the assistant works and strives only for characters, and, having obtained them, he ceases to learn or to improve his skill, since he is well aware the employers look chiefly to references, and, in the assistant's own words, "my references are good enough to take me in anywhere."

Employers on their part use the system to drag men from one end of the country to the other, instead of engaging by personal application from those who reside in the district. They prefer for certain reasons to select an assistant from a distance. This long travelling is a hardship upon assistants, who are constantly stranded miles from home, and suffer much injustice, rather than give up their situation and be compelled to tramp two or three hundred miles home again. The engaging from a distance opens up innumerable possibilities of abuse.

The reference also places in the hands of the employer a power over the life of a fellow being which no man should have. It gives him a ready means of ruining an assistant on the most trifling pretext by refusing a character, a power which no man has a moral right to exercise over another.

The abolition of the reference would likewise help to bring about more stability in the relations of photographers with their *employés*. It is surprising with what indifference an employer will dismiss a good workman, and an assistant with good references at his back give up an employer. I should think that in no occupation are these changes so frequent as in photography. Long service is unknown, twelve or eighteen months being the average, this, no doubt, resulting from the facilities offered by references, an employer finding an assistant and an assistant an employer with little trouble.

Without some check, it may be asked, How would an employer know that a man could do his work, and what proof would he have that the applicant for a situation was capable? As I have pointed out, they have no real test at present, references being no protection against engaging the incompetent, so failing in their object. Everything seems to show that, without testimonials, the annoyance and waste caused through engaging a "duffer" would be less, because applicants for work would know that they must depend solely on their ability. The severity of the competition would thus leave only the men who had genuine merit. At present a good reference is sufficient recommendation for a trial of at least a fortnight for the most worthless.

Failing references, two methods are open to secure the greatest efficiency of assistants. (1) That representative photographers constitute themselves an examining body, and grant certificates. (2) That the duty of keeping their members up to a high standard be thrown upon the assistants themselves. An examining body, to grant degrees to operators and diplomas to printers, is of but little value as a test of skill useful in commercial work; at the best its test must be largely one of knowledge, apart from the practical ability of value in business. Examining bodies are guided in action by the opinions of those composing them rather than by the needs of those they examine. They are conservative, slow to change, and do not keep pace with industrial progress. For these reasons they generally fail to meet the demands made upon them.

The second course, to leave the matter with assistants, offers the better solution of the difficulty; it has already been adopted by numbers of workers, meeting with as much success as can be expected from mundane affairs in general. An enlightened self-interest is the spur, and each assistant is made to feel that his wages and position will be determined by his efficiency, and not simply reside in a written character. A desire for self-improvement, and a spirit of independence thus take the place of stagnation and the blind faith in characters.

Organization is a preliminary to such a scheme, the workmen agreeing upon a standard of fitness and a minimum wage, refusing to recognise those who fall below the standard or are not competent to command the minimum wage. In this way a rough test of skill is applied, and the organized workers are in a position to guarantee that every member of the organization shall reach the commercial standard demanded by employers. Of course, this state is only possible to workers possessing the capacity and recognising the advantages of organization. Experience has shown that photographic assistants have not yet developed the capacity, and have much to learn before they can fully appeciate the benefits derived and the power that comes from organization.

JOHN A. RANDALL.

PHOTOGRAPHING BEAUTY.

IV.

THE leading characteristic of portraiture is, of course, the likeness, and should present the individual character; but, as every subject is more or less defective in proportion, so the artist should first perceive where the individual variations of his subject lie, and treat them accordingly, not by obliterating the variations of lighting and posing, but by modifying them, ennobling the character portrayed, and refining the same.

"Observation," says Mr. W. Hanson, "afforded by long practice of portraiture, has almost convinced me that a perfectly symmetrical human face is rarely, if ever, met with after the age of childhood is passed. Perhaps this statement may be regarded by many, particularly of the fair sex, as being much too sweeping in its scope. However, it is not recklessly made, being founded, as I have said, upon long personal observation of many faces varying in type and beauty. The habit, if not art, of accurate observation is acquired by all in some degree, but, inasmuch as all have not equal opportunities for observing the same kinds of phenomena, one person may perceive at a glance minute differences between things with which he is familiar, which another, equally intelligent, would quite overlook, from want of experience in the same field of observation; so a photographer, not because he has more intelligence than other people, but by reason of being continually exercised in the work of observing faces, acquires a power to discern even slight departures from absolute symmetry which an unpractised eye would probably not perceive."

Many operators depend upon development as a means of securing brilliant negatives; this, though in itself a good method, cannot be called a legitimate method. Brilliancy should be secured by a correct disposition of the light during sitting. Contrasts produce brilliancy, but they must be delicately managed, or the result will be very harsh. The happy medium depends chiefly upon the subordination of the half-tones to the high lights. Children's pictures are best when well lighted, and in the majority of cases female heads will bear plenty of light; but men's heads are best treated broadly, with bold lights and fairly deep shadows, which suggest strength. Old people of both sexes require a large amount of diffused light to soften the bold marks of time. Hollows in the face are less visible when the light falls into them, but, when the light falls across, one side of the depression is in shadow and the other side well lighted; hence the depression is well emphasised—*e.g.*, a full face with many wrinkles, hollow eye sockets, heavy eyebrows; a side light throws up every wrinkle, and produces generally a hard result. This is very much reduced by a general and diffused light coming from the front; but, in such a case, great care must be taken to avoid flatness. Fat people, babies, &c., that are "all roundness," and show very few lines or hollows, become very flat with a front light, whilst a soft side light gives a certain amount of relief, and brings out the modelling. Fat faces are seldom satisfactory as a front view, while thin, angular, wrinkled faces

are seldom satisfactory in profile. I have seen a strong top light recommended for pictures of old people, but I do not consider it, as a rule, satisfactory. When light comes too strongly from above, the effect produced is peculiar only to its only striking the top of the forehead, cheek bones, and nose. When a sitter has white hair, I not only stop most of the top light, but use also a hand screen over the head. Of course, there are exceptions to these, as to all other rules.

If a beautiful woman or child is wanted for a composite picture of, say, Venus or Cupid, or any other legendary personage, or should a picturesque old couple be wanted for an old-age study, lose no effort in obtaining a suitable model; an ugly or a plain person in place of a beautiful one is what Harding calls "unintelligent identical imitation," a sign-post likeness, a nut without a kernel.

According to the style of the model, it is easy to select the most suitable background. If this be selected with taste and judgment, you will more than double the value of the portrait. It is really impossible to make a good portrait unless the subject is relieved by a ground harmonising with the nature of the photograph and the style adopted. For busts of both sexes I prefer a graduated ground, not necessarily large, with the graduations starting from the bottom or at an angle. Such a background produces a large variety of light effects and contrasts. The sitter only should form the centre of attraction, the background having no other object than to complete the picture.

Sharpness, so necessary and desirable in small portraits, s far from being so in large heads. The use of single lenses in this particular class of work has of late years considerably increased. Just now the taste appears to run more in the direction of diffused, or so-called pictorial, than of crisp, definition, therefore large and expensive combinations are no longer necessary. *Apropos* the use of single lenses, I cannot do better than repeat the words of the late Mr. J. Traill Taylor:—

"Now that large direct portraiture is so much engaging the attention of amateurs, inquiries are frequently made as to the best form of inexpensive lenses to employ. Single lenses, worked with a tolerably large aperture, answer all requirements. The old form of landscape lens, with its aperture opened out to *f*-8 or *f*-10, according to the degree of diffusion desired, makes a very useful instrument. The front lens of a portrait combination also forms an excellent tool for the purpose when used with a similar aperture. One scarcely needs telling that, in utilising the front of a portrait lens, the back combination must be discarded and the front one put in its place, with its convex surface next the focussing screen. The stops, as fitted, may not, theoretically, be in their best position, but still they answer well for pictorial definition without alteration."

The term "life size" is, in nine cases out of ten, a misnomer. We rarely see life-sized heads. Custom has taught the general public to take a 12×10 as representing life size. Fortunately, on the one hand, it is so, for, if genuine life-size pictures were insisted upon, they would very often prove unsatisfactory, as pairs—husband and wife, for instance—very frequently have heads that will not pair, because a male head is usually longer from chin to hair than that of a female. To-day large heads are usually made by enlarging; whereas, in days gone by, before bromide paper became popular, they were made direct. Direct large heads, by the way, can seldom be made sufficiently perfect without a lot of working up. This fact also helps to account for the custom of to-day, *i.e.*, taking a small negative and enlarging the same by one or other of the many processes now extant. Small negatives, of course, do not require, perhaps, one-tenth of the retouching, and the latter, if carefully done, obviates further work upon the finished print. The majority of successful large direct heads of bygone days were always a little bit diffused, purposely, to prevent undue prominence of freckles, &c. Large head work of my younger days was quite a different matter from that of to-day. We then had large cameras, lenses, plates (wet collodion), &c., and necessarily large prices. To-day it is different. All one has to do now is to make a small print (stamp size will do) and send it with the sum of 6*s.* 6*d.* to a newspaper office, and there you are—a thing of beauty and a joy for ever (?).

In the course of these few remarks, I have endeavoured to give an outline of one of the most beautiful branches of our beloved art, *i.e.*, the photography of the human features. I trust the experience that I have so dearly bought may be of some benefit to some struggling workers. To those who desire further and fuller information on the lengthy and difficult subject of lighting and posing, I would recommend Robinson's *Studio and What to Do in It*, in which are given many useful hints of the utmost importance to studio workers—hints that embody the result of twenty-five years of daily work in the studio.

We all blunder in our knowledge of human nature. We are very apt to think the little circle in which we move to be the whole of mankind. The human race would perish did they cease to aid each other. From the time that the mother binds the child's head, till the moment some kind assistant wipes the death damp from the brows of the dying, we cannot exist without mutual help. All, therefore, that need aid have a right to ask it of their fellow-mortals; no one who holds the power of granting can refuse it without guilt. He who thinks he can do without others is greatly mistaken, and he who thinks others cannot do without him is still more so: "Alienâ optimum frui insaniâ."

RICHARD PENLAKE.

THE NEW TELESCOPE AT GREENWICH.

OUR contemporary, the *Times*, recently printed an interesting article on the new telescope at Greenwich, from which we make the following extracts:—

"If it be true that photography is the most important addition that has been made to the resources of the astronomer since the invention of the telescope itself, it is equally true that its adoption has appreciably added to the difficulties and responsibilities of the telescope-maker. The reason for this is simple enough. With a telescope used only for observations with the eye, stability of mounting and perfect steadiness in motion, however desirable, are not so absolutely necessary as they are when photography is employed. If, owing to some imperfection in the mechanism, the telescope does not exactly follow the motion of the star under observation, which in consequence moves off its proper position in the field of view, the observer can easily bring it back again without any harm being done, the action of the eye being, as it were, suspended during the time that the object is off the wires of the micrometer; but, with the untiring eye of the photographic plate continuously receiving impressions at the end of the tube, it is a different matter. The plate cannot, like the human observer, reject those impressions which reach it when the star is out of the selected position on the field, but must impartially record every position of the image so long as it is on the field at all. Hence the result of defects in the mounting or of irregularities in the driving clock will be the production of unsatisfactory photographs, with blurred and distorted pictures.

"In the case of the new telescope, which has been erected in the new Physical Observatory building, every precaution has been taken to ensure a mounting as rigid and free from tremor as possible. In order to obtain the steadiness of a very broad base, the instrument is placed on an arch joining the tops of two solid piers, to which the lower part of the whole building is firmly tied. The massive equatorial mounting itself is on the model of that which has given excellent results with the 13-in. astrographic equatorial, though several improvements have been introduced by Sir Howard Grubb, the maker of both instruments. Of these, the most notable is the modification of the frame, by which complete circumpolar motion of the instrument is rendered possible, even when it is pointing to the pole. It is usually the case that a telescope is prevented by the projection of the frame from following a star across the meridian. The reversal which is thus necessitated when the star under examination passes from the east to the west of the meridian is obviously a great disadvantage for photographic work, since it may involve interrupting the exposure of the plate. The Thompson equatorial is free from this drawback, and can follow any star throughout its course in the heavens until it has set below the horizon. Motion is communicated to the polar axis by means of a very carefully cut endless screw working on a toothed sector, from a beautifully finished driving clock, which is provided with a sensitive frictional governor, and is electrically controlled, on Sir Howard Grubb's well-known plan, by an independent pendulum, through an ingenious and somewhat complicated system of differential gearing. The clock is driven by a weight of 12 cwt., falling a foot in every eight minutes, and the observer is saved the trouble of attending to it by a small electric motor, which is arranged to keep it continuously wound up, without in any way affecting the going of the clock.

"The new photographic refractor has an object-glass 26 in. in diameter, with a focal length of 22 ft. 6 in., and is the largest refractor as yet specially made for photographic purposes. The photographs it will take will be on twice the scale of the astrographic map—two millimetres to one minute of arc—and, on account of its relatively short focal length, it will possess very great light-gathering power. For separating close double stars, and in other cases in which a larger scale is desirable and there is abundance of light, an enlarging lens can be readily adapted to magnify the image to any extent that may be thought advantageous. The function of the $12\frac{3}{4}$-in. Merz refractor, which is mounted as a guiding telescope, is to enable the observer to watch the star during the time it is being photographed, and, by means of the delicate slow motions in right ascension and declination, to bring the image back to the centre of the sensitive plate as represented by the cross of spider lines, should the telescope, in spite of all precautions, fail to keep precise time with the star. It may be mentioned here that there are four distinct adjustments for the motion in right ascension, the finest and slowest being electrical and operating on the differential gearing of the driving clock. The third telescope at this end of the axis is the Thompson photographic instrument of 9-in. aperture, which is successfully used for solar photography, and can also be employed for photographing the spectra of stars by means of a large prism that may be mounted in front of the object-glass. It gives an image 1 in. in diameter, which can be magnified to 8 in. with an enlarging lens.

"The powerful reflecting telescope at the other end of the declination axis is of the Cassegrain form, and has been constructed under the supervision of Dr. Common, who undertook the figuring of the mirrors. Of these the large one is 30 in. in diameter and 265 lbs. in weight, the silvered glass of which it is composed being 4 in. thick. It is protected from dust, &c., by a plate-glass screen, which folds up in the bottom part of the telescope—made D-shaped to receive it—when observations

are being taken. The small speculum is easily removable, and for it may be substituted in a minute or two either a photographic plate or other mirrors of different convexities having different degrees of magnifying power. With a sensitive plate exposed in this position, the telescope may be effectively employed to photograph faint, diffused objects, such as comets and nebulæ, on the same scale as the astrographic map, since its focal length—11 ft. 3 in.—is the same as that of the astrographic equatorial, though its light-grasping power is immensely superior; but, if photographs are required to show detail of brighter objects, like the moon, planets, double stars, &c., the plates will be placed at the eye end of the telescope, and a small mirror will be used of such convexity as will produce images of the desired size. The lowest scale obtainable in this way is four times that of the astrographic chart.

"It is also intended to use this telescope for spectroscopic work—a purpose for which it possesses great advantages as compared with the large refractor. In the latter the rays of different colours would not all come to a focus at the same point, but the red and yellow would converge at a distance of an inch or more from the blue and violet. The reflecting telescope, on the other hand, brings all the rays to the same focus, whatever their refrangibility. Hence excellent results may be expected with the powerful spectroscope, specially designed for photographic work, which is attached to the mirror end of the instrument."

NOTES ON BRITISH GEOLOGICAL PHOTOGRAPHS.*

AGAIN, for educational purposes it would be a very good thing to replace many of the venerable drawings which have so long done duty in the text-books for representations of unconformity, bedding, dykes, cleavage, joints, faults, contortions, and many other elementary phenomena, by reliable photographs representing the actual facts as the student will really see them. When the collection has further advanced it should be possible to make a very perfect selection from it to illustrate such points, but hitherto it has not been large enough for the purpose, nor has any publisher been found willing to undertake the risk of reproducing such a set of illustrations, although it has often been asked for by those engaged in teaching. It is true that it is not so difficult to obtain illustrative photographs as it once was, and there are some educational series issued by professional and skilful photographers in England, Scotland, and especially in Ireland, which provide a great deal that is required; it is not quite inconceivable that the influence of the collection has had something to do with bringing about this result. But much of the work of amateurs is not at present available for this purpose, although it is superior to all but the very best professional work in the facts it delineates, albeit usually inferior in technical execution. As the Committee's work progresses, it should be possible to indicate where pictures of the most typical examples of rock structure, features of landscape, phenomena of denudation and deposit, glacial action, &c., are to be obtained, even if it should still not be possible to reproduce them by process in a collected form.

The element of time enters into the interest of this collection in at least two ways. Firstly, we may sometimes register the effects produced by geological causes during the lapse of years. The advance of the sea at Reculvers would impress us even more than it does in the two drawings copied in Lyell's *Principles* if he had been able to give two photographs taken from the same spot instead. In Britain we cannot register such physiographic changes as the destruction and rebuilding of volcanic cones, the uprise and downfall of the sea, the effects of great earthquakes, the advance and retreat of glaciers, and the like; but we have landslips, floods, the filling up of lakes and estuaries, the advance of sand dunes, and erosion by streams, seas, waterfalls, and wind.

One of Miss Andrew's photographs shows an unexpected instance of this kind. A pump, erected in 1824, to get the water out of a stone quarry near the coast in County Down, is now to be seen fifty feet out at sea; and one by another hand shows that the shaft at the back of an old cave by which smugglers used to pass their ill-gotten goods inland is now at the mouth of the cave, and all but cut away by the general wear and tear of the coast, while the cave itself has been worked back. Others show in minute detail the outline of the coast at Filey, Flamborough, Sunderland, &c., so that it will be possible to see the progress of future denudations by comparison with them.

On the other hand, the duration of exposures of geological features is often only temporary. Railway cuttings become grassed over, quarries abandoned and closed, trenches and subterranean works filled up and built over, rock exposures soiled over and planted, or even submerged, boulders are broken up and disappear, sea cliffs are worn back or hidden by landslips. All these things might be preserved on paper, so that it is possible to check conclusions founded on them by reference to photographs even when they are no longer open to examination. The Cambridge greensand is becoming an unseen stratum, the crags are gradually disappearing, gravel beds and road-metal quarries are being worked away, stones formerly much worked are being abandoned; records in the form of photographs as well as descriptions ought to be kept. Sir H. T. Wood's photographs of the excavations in the beer-stone, I believe, show features no longer to be seen; and the photographs of the stages of working of the great quarries at Bardon and Mount Sorrel preserved in the collection will be of interest to those who read the papers on Charnwood Forest, and even of greater interest to those in the future who shall find nothing but holes and talus heaps where the hills now stand.

Discussions at the Geological Society as to whether a bed dips this way or that, whether one rock is or is not intrusive into another, or on the nature of the junctions of strata, would occasionally have their acerbity softened by the exhibition of photographs which gave a true picture of the facts, while the record established by such photographs might serve as useful, if perhaps at times inconvenient, reminders.

The future extension of the collection, like its past history, must depend very largely on the local societies and field clubs. These bodies are always asking what work they can do that will employ a good number of their members, and which, though not requiring too much technical knowledge, will really be a help in advancing natural knowledge. This is the very class of work required, and many of the societies have thrown themselves heart and soul into it. Many of them have already been mentioned in connexion with the districts in which their work lies, but there are several others, such as the Chester Society of Natural Science, the Croydon Microscopical Society, the Dover Natural History Society, the Geological and Geographical Societies of Manchester, and the Geologists' Association, which have given ready help. Warwickshire has carried out a Photographic Survey of its dominions, including not only geological phenomena, but subjects of geographical, ethnographical, and archæological interest. It may not be yet possible to carry out such a comprehensive scheme as this in many cases, but it ought not to be difficult to get one or two enthusiastic photographers in each county to register at least the prominent and temporary features and phenomena of geological interest. Guidance and help, where it was needed, would be forthcoming from local geologists and the Survey, and it may be possible in the compass of a few years to have the whole of the United Kingdom fairly well represented, so that there would only remain the task, which will then have become an easy one, to photograph new sections as they are exposed, and new phenomena as they are recorded and understood. We should thus become possessed of a storehouse of fact to which the rising geologist can readily turn to see the state of knowledge at this particular date, to check the older work, and to measure the progress of physiographic change.

Our present experience with the collection shows that one of the great dangers which exists is the want of permanence of some of the prints. Kept away from the light as most of them are, it seems that the ordinary silver prints last fairly well when properly fixed and washed after toning; bromide prints, however, appear to last better, and, of course, platinotypes best of all. It is really worth while to sacrifice some of the depth and detail of shadow, at present an unavoidable defect of platinotype printing, in order to secure the greater permanence which these prints give. To those who take small prints it may also be said that enlargements are very satisfactory from the greater ease with which they can be studied; but it is advisable, by the use of a small stop or a very good lens, to get the negatives from which enlargements are to be prepared as sharp and clean as possible. Very good results are obtained by carbon enlargements, but the process is troublesome owing to the necessity for preparing an enlarged negative; still, such a negative is a valuable acquisition when once it has been made.

Every photographer knows the importance of illustrative drawings taken at the same time as the photograph, or, better still, with the photograph in hand when the section is revisited; such careful work as this adds immensely to the value of the photographs as a permanent record.

Some attempt has been made to make the photographs more accessible and useful by promoting exchange between contributors, and the Committee can always be utilised as a means of inter-communication; some photographers have been kind enough to place their negatives in the hands of professionals, from whom lantern slides and prints can be obtained on paying the expense of production. It would, however, be far too large a task for the Committee to undertake any further action in this matter or to assume the copyright of prints sent to them; this must remain in the hands of the original photographers, and arrangements must be made with them in each case.

In conclusion, I feel impelled to add a word about the regulations and forms issued by the Committee, which have been objected to in some quarters. In the first place no hard-and-fast rules are insisted on; only certain *hints* have been drawn up as they were suggested by the experience of the Committee, now somewhat considerable. Uniformity in size is unattainable, nor is it at all necessary with the present system of mounting, but the larger photographs are, up to whole-plate size, the more easily examined. Larger ones, up to 15 in. by 12 in., can be accommodated. For the reasons given before, permanent prints are obviously more likely to be useful to posterity than others. A scale of some sort, no matter what, if its size is given, where necessary, in the explanatory form, is really required in order to impress the scale of the structure photographed; the human figure does very well—a hammer of stated size is convenient in smaller views if it is placed so that its entire length lies at right angles to a line joining the camera with the centre of

* Concluded from page 314.

the picture; an umbrella or walking stick is quite satisfactory; or it suffices to indicate the length of some portion of the section, easily recognisable in the print, on the accompanying form. The use of the standard descriptive forms is very desirable; they are mounted with the photograph, and, if the chief details are filled in, they enhance its value enormously. It is very important that these forms should be sent, filled in, with the photographs to ensure absolute accuracy, and, although it is not necessary to attend to all the minute details for which space is provided, some of them, like the date (at least the year, and when possible the month) and the exact location, so that the place could be found again, should be carefully given. It has recently been my lot to fill in some hundreds of these forms for other people, and this has led me to appreciate the labour involved; but it has only convinced me more completely of the necessity for them, and that they should be filled up by those who know the locality and its geology well.

I am hoping to have a number of the older photographs looked over, as opportunity occurs, by those who are most familiar with the localities in question, so as to bring out to the fullest extent at present practicable the latent value and interest of the whole collection.

W. W. Watts, M.A., F.G.S.

THE PHOTOGRAPHER'S WINDOW.

Any suggestion that may contribute to the lifting of the professional photographer out of the slough of despond, in the shape of insufficient work at such low prices, which he is now stuck in, should have something of value about it; and the giving expression to such is evidently a task grateful to The British Journal of Photography, as gratefully appreciated, doubtless, not only by the harassed and hard-working body of men it is sought to benefit, but also, in addition, by a mass of thoughtful amateurs, who, although not having to gain their and their children's bread and cheese by the camera, are yet, from their experience of the work, better able to appreciate the nature of the struggle, and sympathise with the strugglers.

The old order of things, as far as profits are concerned, having passed away for good, the best course must be, to look out for new openings, new practicable openings, for the exercise of the skill and labour now so insufficiently paid for.

Now, it may at first sight appear rather a startling statement to make, but I believe it to be a true one, that the professional photographer himself is not the best judge of a new opening.

The wise doctor, recognising individual trammels and personal weakness, never prescribes for himself when ill, neither does the wiser lawyer draw out his own will. And so it should be, and is, in the case of the photographer; the old narrow grooves have been travelled along for such a time, so deepened by the wear and tear of constant tread, that by this their occupants cannot look over the sides, and, despondently giving way to the perhaps natural feeling that the world is their closely shut-in little world, are each day getting ever more disinclined to the effort of a fresh and vigorous jump out of the old ruts, and a more lightsome and beneficial striking across new country. They need the help of an extended hand, or the impetus of a "leg up."

All very well in the abstract, but how about the reducing to practice? Well, take for example one important, if not the most important, factor, by which he should attract his customers, the window display. Having looked at one in a town, what is there, as a rule, worth looking at in the rest? Are they not all of the same uniform and insipid type? A more or less regular and geometrical arrangement, against a more or less—generally more—faded plush background, around a whole-plate wedding group, of an indefinite number of *cartes-de-visite* and cabinets, overhung probably by a black-and-white enlargement, carefully worked up, of some local worthy "at the docks," on the corporation, or in the Church—representations, with startlingly few exceptions, of all kinds of unnatural attitudes of bodies, and staring, inane expressions of face, all reduced to uniform sizes, printed upon one or two kinds of paper, toned up to one standard level.

Some change must be sadly wanted. Members of other professions have to think, and be ever thinking, of new work in fresh directions, and the photographer, if he is not to be left helplessly stranded, must do the same. Best kinds of developers, most suitable brands of paper, and other matters in that direction, can be safely, and I think generally are, left to the inquisitive amateur with a touch of the scientific and the "faddy" about him. They could not be in safer or more suitable hands; very good results are frequently obtained, which should, of course, be eagerly laid hold of and adopted; but, in other directions, with his special knowledge, the command of the conveniences of the studio, and his practised manipulation, to say nothing of the more mundane, but to him most important, £ *s. d.* interest, the professional ought certainly to take the lead.

Two essential points have to be borne in mind in working towards a change, the taste of the buying public, and the capacity of the average photographer. The public has been trained so far, in quite an empiric way, to think it appreciates the "good photograph" of to-day, goodness being synonymous with correct rendering of minute detail, important or otherwise, "Rembrandt lighting," extreme finish, and high polish.

Now, supposing these as primary factors be sunk, and the experiment tried of introducing a little human interest instead, or as well. Take that pleasant-looking little mother, for instance, who, young though she be, surely never nursed her baby at home in that gorgeous dress, holding it in that ridiculous position; and, granting fondness to be but naturally expected in her expression, why was it not recorded as such, and not as a flat simper? The fault lay in the main with the photographer, in that he would not encourage her, by doing nothing, to assume her natural position, but must needs instead, consulting honestly what he thought Mede-and-Persian-like photographic laws, arrange here, straighten there, fiddle faddle everywhere, blotting out all individuality in the sitter in so doing, and finally, when all was ready, waiting for assured steadiness or something else, keep the little body on the smile, until it had, losing spontaneity, frittered and drivelled out into what we here have represented.

Would it not have been far better to have focussed beforehand—not necessarily with a portrait lens—upon a low-swung bassinette or cradle, got the mother to have put the child in, and caught the interchanged smiles between the two as she raised herself from so doing; or, if it be a nurse that takes the mother's place—as she unfortunately is given the frequent chance of doing nowadays, in this, as in far more important directions—would she not have looked far more taking, and in character, with her cap off, sitting at the cradle side, some little knickknack in the way of sewing in her hands, and smiling at the baby, rather than as she is, ignoring the baby, and smiling at the photographer? It can be done, but not by the tedious camera levelling and focussing, piffling arrangement of dress folds, and the rushing to and from the dark room, now so disconcerting, so wearying, and so much in vogue.

The little girl of three or four again, why must she be posed standing on the velvet-cushioned old carved chair? or, if sitting, why with one leg curled under her? Why posed at all, indeed? Simply because it is the fashion, I suppose, certainly not because they are usual and natural positions, for I am certain that any one who chooses to observe children will find that, when they, in the mother's absence, stand on a chair, they almost invariably turn to lean over the back or sides; and that, at the rare times they do sit quietly, they far more rarely sit on a foot and leg. Why not have brought and given her her pet doll, and, if a chair be absolutely necessary, have allowed her to do her nursing leaning against it? The child would then have looked natural, been desirably quiet and tractable, and the proof such a success, as probably to have led to the emphatic expression upon the father, and payer's, part, when shown it by the smiling mother, of, "My word, Mary, but this is a good one! Better order two dozen, my dear, and inquire how much an enlargement would cost."

Or there's the old lady with the pleasant face—which, by the way, would look still more pleasant had the wrinkles in it been left as severely alone as those in her silk dress—hands folded primly in front, and so on.

"It's mother, and yet it isn't," very justly, and aptly, remarks her married daughter to a friend when looking at the finished product. Place a small set of tea-things on a little table at her side—it would be no great stretch of expense to provide the tea as well, on a, to her, so trying an occasion, and let "granny" be portrayed, as with brightened face she is about pouring it out, or lifting the cup to her mouth, and the daughter's comment then would be, "Well, here's mother to the life at last, I must ask what a second dozen would cost."

Look, further, at the kindly old rector in the next row, sixty-six if he be a day, leaning uncomfortably forward in the chair, ignoring the fact of its having arms and a padded back, reading a large cumbersome volume, as likely as not without the glasses no one has seen him reading without for the past ten years—lacking, if not the Promethean spark of life, decidedly the possible vivid one of natural and lifelike position, how can the bazaar quotation for twelve dozen be reasonably expected?

Lastly, take the ever-present wedding group. This must always, of course, remain more of a loving record than an artistic production, for what mortal can hope to render, in anything but set and formal fashion, so many diverse characters upon a one plate, all suffering, more or less, from suppressed excitement, and ranging from the stately vicar who performed the ceremony, to the bride's brother, a medical student at "Barts'" who was very jolly, but anything but stately; and including portly father, regretful-looking mother, blushing bride, happy bridegroom, and jolly bridesmaids. But, the group having been disposed of, why not have suggested taking the bride by herself? What a fine chance as a rule lost! A lovely girl, in her prime, at her best, *and in her best clothes!* How eagerly would not the newly made young husband have closed with the suggestion, with the subsequent one of an enlargement, and how willingly have paid a good price for it! Finally, and chiefly, what an attraction for three or four days in the window *by itself!*

There has barely been a start made in the right direction, in this photographing of that which, giving human interest, would be at once recognised, by men and women at large, as a faithful depicting of what they are all familiar with, and which oftentimes, in appealing to a special spot, would be treasured, as serving to keep alive and fresh individual experiences, gay or grave, pleasant or regretful.

We are here, at any rate, upon higher ground than that of making everything subservient to present standards, the rendering capacity of a

certain form of lens, a special style of lighting, set positions, and unwrinkled brows; and people will buy, and readily pay a good price, not for what the photographer professionally holds to be good and high-class, but for what they themselves like.

Impossible of accomplishment will say the many, of course; but the same thing has been said by the many respecting every new departure, from the occasion when Tubal Cain, the first artist in metal, was, doubtless, scoffed at by his skin-clad relatives and friends around the primeval camp fire, when he said that the existing style of wooden poker, burnt out each evening, was an extravagant one, and that he would produce one that wouldn't bend or burn away at all, down to the present day. Wrong they have been proved to be in the past, wrong they will continue to be proved.

As to its bearing upon the worker's capacity, he in the first, and main, place being a man, ought to feel himself upon safer and sounder ground, in his catering for such demands, than in the secondary one of photographic artist. Artistic work is very fine when properly carried out, it is readily and willingly admitted, but the carrying out is given to but few specially gifted and trained ones, with carefully selected subjects; the imitative art effects and productions of the ordinary man, working for a living are very different things, mere ill-appreciated bastards thrown upon a cold world, judging by the amount of grumbling going on.

So much in the way of criticism, and a suggestion of fresh direction, of style of work. Almost an equally important item must be the manner in which the work should be exhibited to greatest advantage. Too many small items there always are in the window. Attention under such circumstances cannot be led up to, and concentrated upon, a one central picture, so that the observer might leave, not as he does a picture gallery or the British Museum, in a nebulous state of mind, and with an incipient headache, but with a definite, easily remembered, impression of a one pleasing thing. This could be very easily managed by taking out three-fourths of the more commonplace work, and rearranging that left in a more artistic fashion, to serve as a foil to a one enlargement of an assured and acknowledged success; one of such subjects, for instance, as those already suggested, the baby in the cradle, the child and her doll, the bride, or the old lady at her tea-drinking. A catchy title would prove a further help, and serve in addition as a useful handle for reference by an admirer in directing a friend to look in. In the cases mentioned they might be something after the fashion, say, of Mother's Chief Treasure, Maternal Instinct, The Happiest Hour, and Contented Old Age.

That this way of attracting attention would prove more effective than the present one, or the present absence of a definite one, I from my own experience have little doubt. The proof of the pudding is in the eating. A friend asked me a short while back to look into a certain photographer's window, to see an enlargment of a little girl, smilingly leaning against a chair. "A 1," he called it; adding further, "sure to hit you off, old man." I may add that I have a little girl of my own, and he probably had heard my wife say that she "could get up her father's sleeve" more readily and easily than anybody else — did so; sure enough, it was a delightful picture, and refreshingly sweet. I liked it so much that I had an enlargement of my own youngster, to say nothing of a dozen cabinets, from the same man, before the month was out. A friend I, in turn, spoke to of the matter, had his two boys also taken in the same place, and says he is going in for an enlargement as soon as he has a pound or two to spare.

Other individuals, like ourselves, would, doubtless, respond in the same way, if shown what they like, what they as fathers, mothers, sons, and daughters, must like. J. Rees.

INTENSIFICATION BY MEANS OF FERROUS OXALATE.

[Read before the Croydon Camera Club.]

This method of intensification is, theoretically, the most perfect, inasmuch as, if properly carried out, the resulting negative image consists of metallic mercury and metallic silver, the whole of the silver of the image being left in the film. However, like most theoretically perfect processes, it needs to be carefully carried out, or stains will inevitably result. This is, in one way, an advantage, inasmuch as, if a negative be intensified by this method, and present no stains when it is finally dried, it may be relied upon to be permanent; whereas, by other methods of mercurial intensification, the operation may, to all appearance, have been successfully carried out, but, on keeping, stains will gradually make their appearance, and, it may be, a valuable negative will be seen to gradually perish before the owner's eyes.

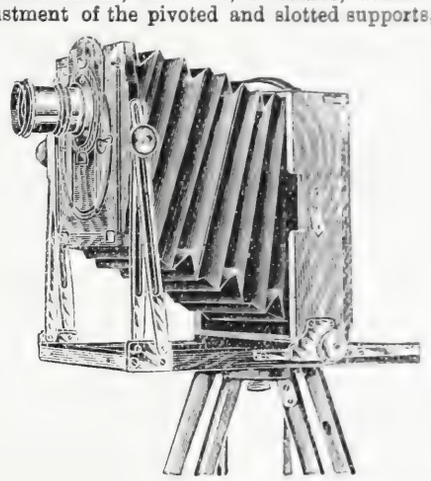
The ferrous-oxalate method of intensification may be carried out in diffused daylight. If sufficient density is not obtained, the process may be repeated to any required extent.

In the first place, all hypo must be carefully removed by thorough washing. If this has not been done, the hypo should be decomposed by the application of a bath of alum, or, better, a dilute solution (1 : 200) of hydrochloric acid. Then thoroughly wash and immerse in a saturated solution of corrosive sublimate, to each ounce of which a drop of strong hydrochloric acid has been added, till the image is bleached. Then wash for twenty minutes in running water, rinse with distilled water, and soak in the same for five minutes. The treatment with distilled water is necessary, as the lime in the top water would otherwise cause markings. Immerse the bleached and washed negative in a solution of ferrous oxalate, prepared by adding one part saturated solution of ferrous sulphate to four parts saturated solution of potassium oxalate. The image will now gradually blacken. When this blackening has extended to the back of the film, pour off the solution of ferrous oxalate, soak in distilled water for six minutes with three changes, and finally wash well. If distilled water has not been employed, it is necessary to soak the plate after washing in a one per cent. solution of hydrochloric acid for a few minutes, to remove the oxalate of lime deposit, then rinse well and set up to dry. F. P. Wratten, A.R.C.S.

THE SANDERSON UNIVERSAL SWING-FRONT CAMERA.

It is nearly two years (The British Journal of Photography, July 19, 1895) since we wrote of Sanderson's universal swing front that, in virtue of the power it afforded the photographer of raising or lowering the lens to the utmost extent which the camera allowed of, the swing back in camera construction could be dispensed with. Some improvements in the method of carrying out its essential adjustments have recently been made, and this has provided us with an opportunity for bringing Mr. Sanderson's decidedly useful modification in the construction of cameras once more to the notice of our readers.

The illustration shows one of the Sanderson cameras with the lens raised to its fullest extent, and it is, of course, obvious that, by the necessary adjustment of the pivoted and slotted supports, the lens may



be either inclined, or extended or depressed, thus supplying universality of movement from the front of the camera, and obviating the disturbance of the back.

The principal points in this system of extracting the maximum degree of available efficiency from camera and lens are summarised in the course of a short paper on the subject by Mr. Sanderson, in which, after reviewing previous forms of field cameras and the practical difficulties they sometimes involve, he states that he came to the following conclusions:—

"First. That the placing of an image of a given object upon the focussing screen in some desired position involved certain mechanical adjustments of the lens in relation to the said screen.

"Second. That, if the lens could be so placed as desired in relation to the focussing screen, the mechanical means employed in so doing would not affect the result in any way, and only the question of a device which offered the greatest facility need be considered.

"Third. That, if a vertical screen be an absolutely fixed factor when dealing with perpendicular lines, then there can be no advantage in using a swing back, and a means for raising, lowering, and tilting the lens need only to be provided for."

"With these facts well grounded in my mind," he proceeds, "I conceived a camera working on somewhat novel lines, which should always stand level, the back of which should be fixed at right angles to its base, the front to be so constructed as to allow the lens to be raised or lowered, or tilted at any desired point. I found great difficulties, however, in giving this ideal camera practical shape, knowing of no mechanical device which would give the movement I desired, and only after repeated experiments I hit upon the idea of the simple crossed slotted arms, between which the lens front is supported.

"This simple device more than fulfilled my most sanguine expectations, for it not only gave me a wonderful range of falling, rising, and swinging movement, but gave me a backward and forward motion in addition, which I found would greatly facilitate the rapid composing of a subject, as foreground and sky could be arranged and roughly focussed by one and the same movement. Further, it provides additional extension over and above that supplied in the usual way, as will be seen when the arms are extended."

We have been shown photographs of a comparatively tall building standing in a confined situation taken with an ordinary camera and with

Sanderson's camera. In the one case, after all the available movements of the camera had been utilised to their fullest extent, the top part of the building was cut off—or, in other words, the subject had too much foreground; while, in the case of the photograph taken with the Sanderson camera, the subject was properly placed on the plate, and this without tilting the camera, the result being obtained by both raising and swinging the front, the latter in order that the full covering power of the lens might be employed.

But, in addition to being shown the photographs referred to, we were also given the opportunity of observing how the Sanderson camera practically behaved when pitted against cameras of ordinary construction, and the point was subjected to actual experiment one day last week at Cambridge, when a number of negatives of the entrance to King's College Chapel were taken under test conditions. Prints from those negatives are before us as we write, and they illustrate the undoubted fact that, while with a lens of a given focus, working on a plate of a particular size and fully employing the elevation of the front and the swing of the back of a camera of ordinary construction, vignetting of the image and an excess of foreground are necessarily obtainable, the great range of rise possessed by the Sanderson camera easily allowed of the fullest available area of subject being directed on to the sensitive plate, while the swing obtainable also allows advantage to be taken of the utmost covering power of the lens.

There is no doubt that for photographing architecture, and in difficult situations, the Sanderson camera is capable of proving exceedingly useful. It obviates tilting, and certainly saves time in the adjustment of the image on the screen. The movements of the front are simple in the extreme, and the revolving lens board, with which the camera is fitted, is obviously a great convenience in directing the objective to a particular part of the plate. For this excellent camera Messrs. George Houghton & Sons, of 89, High Holborn, are the licensees and manufacturers.

THE LATE P. MEAGHER.

We are sorry to have to announce the death of Mr. P. Meagher, the well-known photographic-apparatus maker of 21, Southampton-row, W.C., which took place on Saturday, May 8, in the sixty-seventh year of his age. The deceased, who was buried on Thursday, the 13th inst., had been in failing health for some time, although he had not wholly ceased attending to his business. The immediate cause of death was a painful internal complaint, from which he had long suffered.

Mr. Meagher had been engaged in the production of photographic cameras for about half a century. He was formerly in the employ of the well-known camera-maker, Ottewill, who may be regarded as the source to which the best school of English camera-making traces its origin. If we mistake not, Mr. Meagher commenced business on his own account about the year of the Great Exhibition, and his early experiences as a camera-maker often formed the subject of conversation between the deceased gentleman and ourselves.

If the name of Meagher is not associated with the introduction of any very great novelty of design in the construction of cameras—we believe the side flap as a support for the camera body is the only distinctly original feature with which he can be credited—there is no doubt that a Meagher camera has been long worthily put forward by practical photographers as a model of efficiency, durability, and excellence of construction. Somewhat disposed to conservatism of idea in this regard, the extreme lightness, portability, and multiplicity of movement possessed by many modern cameras found little favour in Mr. Meagher's eyes; nevertheless, his type of camera is much appreciated by the old school of workers, and will always command considerable favour.

The deceased gentleman, who was highly esteemed by those who knew his kindly nature, leaves a widow, but no family. The business, we believe, will be conducted as hitherto.

Our Editorial Table.

The Year-Book of Photography, 1897.

Edited by E. J. Wall, F.R.P.S. Published at 22, Furnival-street, E.C.

The editor's preface to this ably compiled volume expresses the aspiration that the book may become dog's-eared and thumb-marked from constant reference. The *Year-Book* for 1897 is so useful and informative that we have every confidence in the realisation of Mr. Wall's aspiration. "Elementary Optics" is the title of the first article, and, in the course of it, by the aid of numerous explanatory diagrams, Mr. Wall concisely treats of the optics of photographic lenses in such terms as to place the subject well within the comprehension of even the least intelligent worker. "Development" is the title of an exhaustive article on the properties of the various reducing agents, which fascinated us by its lucidity and evident practical knowledge. One section of the book, which, under the title of "The Photographer's Gazetteer," tells the would-be tourist where to go, where to stay, and what to photograph, at scores of well-known places of interest in Britain, should be simply invaluable to amateur photographers during the summer and autumn seasons. Several other articles of practical value, including an excellent one on "Lantern Slides" by Mr. Dockree, and one on "Silver Printing" by Mr. J. A. Randall, numerous half-tone illustrations, many useful reference tables, and a review of novelties in apparatus complete a volume of singular excellence and interest.

The Dictionary of Photography.

Published by Hazell, Watson, & Viney, 1 Creed-lane, E.C.

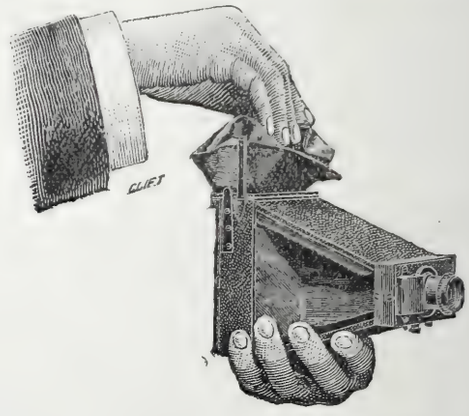
The first six editions of this well-known work were produced by the original editor, Mr. E. J. Wall; but the present one, the seventh, has been revised, added to, and brought up to date by Mr. Bolas, who, as might be expected, has performed his task with characteristic thoroughness. A glance through the book is sufficient to assure us that the *Dictionary of Photography* has not been allowed to lose its well-won reputation as a standard work. As evidence of its completeness, we note that the optical section is brought down to the inclusion of a lengthy reference to the most recently introduced lens, the Stigmatic. The *Dictionary of Photography* is an invaluable work of reference.

The "Triad" Pocket Camera.

George Houghton & Son, 89, High Holborn, W.C.

This is a decidedly useful and effective form of pocket camera. Closed up, as shown in the smaller illustration, it measures $6\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{3}{4}$ inches. Its principal features may be thus summarised: It carries six plates, $3\frac{1}{2} \times 2\frac{1}{2}$ inches, in sheaths, which are contained in a magazine. This magazine measures only $4\frac{5}{8} \times 3\frac{1}{2} \times 1\frac{3}{8}$ inches, and the two sides supporting the lens and shutter fold on either side of it when closed for carrying. The camera is opened ready for use in a moment, and, after the exposure is made, can be instantly closed. The plates are changed on the bag principle. The sheaths are numbered on the back, and it can be seen how many exposures have been made by means of an aperture, protected by non-actinic glass, in the back of the magazine. A finder, on the well-known principle of sight hole and cross lines, is affixed to the camera, which has a simple and effective time and





instantaneous shutter. The Triad is an extremely compact, well-made little instrument, and, from an inspection of it, we should judge it to be very serviceable to those who require a camera of great portability, which can be rapidly got ready for use, and in which the working parts have been designed with a view to securing practical efficiency.

Catalogues Received.

George Houghton & Son, 89, High Holborn, W.C.

Messrs. Houghton's catalogue is a comely volume of some 534 pages. It has some hundreds of illustrations, and, as we turned over its pages, we wondered to ourselves whether there was anything in the way of modern photographic manufactures and preparations which did not find mention in it. Apparently, we might look in

vain. The catalogue appeals to professional and amateur alike, and should be found useful by both classes of photographers. Messrs. Houghton have many specialities of their own to offer, which makes the catalogue of additional value.

Benetfink & Co., Cheapside, E.C.

MESSRS. BENETFINK'S catalogue is just one of those publications in which the enthusiastic photographer would delight; its hundred odd pages are filled from cover to cover with illustrations, prices, and descriptions of a bewildering array of photographic apparatus. The firm's specialities include light and useful stand cameras, hand cameras (in great variety), portable developing tents, washing trays, camera parts and fittings, &c. It is an extremely useful catalogue, complete, comprehensive, and concise.

James Braine & Sons, 22, Bedford-terrace, Moray-road, Holloway.

MESSRS. BRAINE'S catalogue is exclusively devoted to cameras, stands, lenses, lanterns, and other apparatus, which are illustrated in considerable variety. With their cameras and general apparatus a twelvemonth's guarantee from date of purchase is given.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, May 26, at eight o'clock, *Photographs Old and New*, with illustrations, by Mr. Thomas Fall.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The Prize Camera for current month has been awarded to Mr. Francis Bernard Kempe, St. Veryan's Vicarage, Granpound-road, Cornwall, for his negative, *Truro Cathedral Reredos.*

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, May 25, at 12, Hanover-square, at eight p.m. *The Optical Effects of Intensification*, by Mr. Chapman Jones, F.I.C., F.C.S. *Some Notes on the Correct Rendering of the Colours of Flowers*, by Mr. H. T. Malby.

THE proprietor of the cinematograph and his two assistants whose carelessness is alleged to have caused the terrible fire at the Charity Bazaar in Paris are to be prosecuted for manslaughter. The Juge d'Instruction has not yet come to a decision as to the responsibility of the Organizing Committee, of which Baron Mackau is the President.—*Dalziel.*

MESSRS. HENRY & Co. will issue at once a new holiday library, to be entitled "The Random Series," in twenty-six volumes, in which they propose to include a number of their most popular publications in fiction. The series will be published at 2*s.* per volume, in a uniform binding, and among the authors represented will be such well-known names as those of Mrs. Hungerford, Miss M. Betham-Edwards. Sir Herbert Maxwell, M.P., and Messrs. Herbert Vivian, Barry Pain, H. W. Lucy, G. A. Henty, G. B. Burgin, Morley Roberts, Louis Couperus, H. D. Traill, Rudolf Lehmann, W. H. Pollock, and F. Norreys Connell.

AN ALBUMEN FACTORY IN CHINA.—Consul Fraser, in a report to the Foreign Office on the trade of Wuhu, says, in connexion with eggs: "It may be mentioned that a resident German firm is starting an albumen manufactory at Wuhu (albumen is used in photography, for the leather of gloves, and for making fast dyes for cotton-print fabrics). The firm will employ some sixty hands, of whom about fifty will be workwomen, the breaking of eggs not requiring much physical strength. Premises are being erected for machinery, fermenting rooms, and drying rooms. From 7000 eggs between 500 and 600 pounds of yolk may be extracted, and 100 pounds of albumen."

NEW COMPANIES.—Hurman, Limited. This Company has been registered by Turner & Co., Carey-street, W.C., with a capital of 10,000, in 5*l.* shares, of which 500 are six per cent. cumulative preference. The object of the Company is to enter into an agreement with Frederick K Hurman, of St. Nicholas-buildings, Newcastle-on-Tyne, and to carry on the business of manufacturers of, and dealers in, photographic goods, apparatus, and chemicals, photographers, artists' colourmen, picture and art dealers, printers, lithographers, paper dealers and manufacturers, newspaper proprietors, photographic agents, &c. The number of Directors is not to be less than three nor more than five; the subscribers are to appoint the first. Qualification, thirty shares; remuneration, ten per cent. of the net profits divided between them. Frederick K. Hurman is the Managing Director, with 250*l.* per annum.—Metallic Photo-printing Syndicate, Limited. This Company has been registered by A. Taber, 5, Abchurch-lane, E.C., with a capital of 5000*l.*, in 1*l.* shares. The object of the Company is to enter into an agreement with F. Ahrle, and to acquire, develop, turn to account, work, and deal with certain patents and inventions relating to the production of photographs in gold, silver, and other metals, on polished or other surfaces. The first Directors (to number not less than three nor more than five) are Messrs. J. W. Anderson, C. Fry, and W. M. Whyte. Qualification, 100*l.*; remuneration, 25*l.* each per annum.—Photo-enamel Syndicate, Limited.—This Company has been registered by Longbourne, Stevens, & Co., 23, Palmerston-buildings, E.C., with a capital of 20,000*l.*, in 1*l.* shares. The object of the Company is to acquire and carry on the business of the Modern Art Syndicate, Limited, including all its patents, rights, and interests. The first Directors (to number not less than two nor more than five) are to be nominated by the subscribers. Qualification, membership of the Company; remuneration, as the Company may decide. Registered office, 88, Bishopsgate-street, Within, E.C.

LUMINOUS PHENOMENA OBSERVED ON MOUNTAINS.—Mr. C. G. CASH writes to *Nature*: On Easter Monday, 19th ult., I was ascending Braeriach by its well-known northern ridge, and, shortly after I had crossed the "snow line," I witnessed a phenomenon of great beauty, the explanation of which I cannot give. The edge of my plaid, of my gloved hands, of my knickerbockers, &c., was bordered by a two-inch band of brilliant violet light, at the moment of beginning any movement. The light was not visible around anything at rest, not did it persist, but only showed at the moment when rest was exchanged for movement. My attention was directed to this for a very short time only, for heavy snow began to drive in my face, and I had to watch where I was going, as the immediate surroundings included dangerous ground. After my return, I found an account of a somewhat similar appearance in the *Cairngorm Club Journal*, vol. i. p. 159. I copy the account as there given by Dr. John Gordon, of Aberdeen: "Half way across the snow slope, while the sun was somewhat obscured, but was still sending a considerable intensity of light, we observed a strange phenomenon. On the side of our body next the snow slope there was a nimbus of violet light, which clung to clothes, naked fingers, and the shaft of the ice axe. So plentiful did it appear in the palm of the hand that it looked at times like a pool of violet ink, and one thought it could be pitched away. On shaking the hand, however, the nimbus clung, and was not to be removed. Occasionally the colour varied, taking on shades of brownish-yellow and blue, but violet was the most marked colour. At another time, in much the same condition of light and snow surroundings, one of the party, who was very proud of the beauty of the silver case of his compass, was disgusted to find that it had a distinctly yellow, pinchbeck look. This light refraction or polarisation [?] was not so evident to some of the party, but the writer has observed it before in similar circumstances and atmospheric conditions." I may add that, in my own case, no direct sunlight reached me, as I was in the lower part of a dense cloud or mist. Some of your readers may offer an explanation of this remarkable and beautiful appearance.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Meeting of Delegates, held on Monday, May 10, 1897, at 12, Hanover-square, Mr. W. Thomas (Chairman) presiding.—The minutes of the last meeting were read and confirmed. The report was read of the Circulating Pictures Committee, in which they stated that they had carried out the instructions given to them, a collection of the pictures being now in circulation, the cost of which, for framing, packing, &c., amounted to about 9*l.* 10*s.* It was proposed by Mr. J. B. Huddy (Richmond C. C.), seconded by Mr. J. H. Baldock (Croydon Microscopical Club), and carried, that the report be adopted. It was agreed that a fixed sum should be paid by each Society for the loan of the pictures, and that the carriage should be defrayed by the Affiliation, the sum to be settled by the Chairman and Secretary, the amount being based upon the probable average cost for carriage. A letter from the Weymouth Photographic Society was read. It was agreed to get lighter boxes for the conveyance of small numbers of slides, such boxes, when practicable, to be sent by Parcels Post. The postage of such lectures as can be sent in this manner to be stated in the *Journal*, and to be prepared by the Society borrowing the same. The various resolutions and recommendations passed at the Leeds meeting were considered. The creation of districts, as then suggested, was discussed, and, on the proposition of Mr. G. A. Bickerton (Richmond C. C.), seconded by Mr. F. A. Bridge (Photographic Club), the recommendation was approved, and the two existing districts (the Yorkshire District and the Metropolitan District) were confirmed. It was understood that the creation of other districts should be arranged when application from the local societies was received to that effect. The proposition sent forward by the Leeds meeting to form a Committee of Judges to whom the Society competitions might be submitted was discussed at some length. It was agreed that a Committee of six Judges be elected, and the Societies be asked to arrange for any competitions which they wish judged, to be held at such dates that the judging may take place in London during the first week in January, April, and July respectively. It was agreed that the Chairman, Mr. J. C. S. Mummery (North Middlesex Photographic Society) and the Secretary constitute a Committee to arrange for the appointment of such a Committee. A discussion took place upon further additions to the Circulating Exhibition. It was proposed by Mr. A. J. Golding (North Middlesex Photographic Society), seconded by Mr. Bickerton, and carried, "That the Royal Photographic Society be asked if they would be willing to place a sum annually at the disposal of their Judges for the purchase of pictures for their permanent collection." Upon the understanding that the Affiliation Committee might have the loan of them for circulation, they would be willing to contribute twenty-five per cent. towards the annual expenditure, provided such do not exceed 25*l.* in any one year. Further lectures to be ready for circulation towards the end of the year were arranged.

Patent News.

THE following applications for Patents were made between May 5 and 12, 1897:—

PAPER PLATES.—No. 11,053. "Improvements in and connected with Photographic Paper Plates and Diapositives." MAX JOLLES and LEON LILIENFELDT.

DARK BACKS.—No. 11,133 "Improvements in Photographic Dark Backs for Successive Exposures for the purpose of Colour Photography." GUSTAV SELLE.

ANIMATED PHOTOGRAPHY.—No. 11,273. "Improvements in Apparatus for Taking and Exhibiting Kinetoscopic Films or Animated Photographs." CECIL WILLIAM BAXTER, CECIL WRAY, and JOSEPH OULTON.

PHOTOGRAPHIC ALBUMS.—No. 11,295. "Improvements in Albums or Books for Photographs, Pattern Cards, and the like." LEON AUGUST MARION, HENRI GUIBOUT, GEORGE BISHOP, FRANK BISHOP, and JOHN PATTINSON KIRK.

MOUNTING APPLIANCE.—No. 18,505. "A new or improved Device or Appliance for Facilitating the Mounting of Photographs and the like." WILLIAM ARTHUR BRADLEY, GEORGE HUTCHINSON, and JOHN MEADOWCROFT.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
22	Ashton-under-Lyne	Excursion: Compstall. Leader, Major Bradley.
24	Halifax Camera Club	*Enlarging.* John A. Hodges, F.R.P.S.
24	North Middlesex	*Lenses.* Henry Crouch.
24	Stafford Y.M.C.A.	*At Home Subjects.* Mr. Wray.
25	Birmingham Photo. Society	*Hints on Sketching Microscopic Objects for Lantern Slides.* H. W. H. Darlaston.
25	Hackney	*X Rays to Date.* Dr. Gerard Smith.
25	Isle of Thanet	Exhibition of Prints, &c.
25	Royal Photographic Society	*The Optical Effects of Intensification.* Chapman Jones, F.I.C., F.C.S.—*Some Notes on the Correct Rendering of the Colour of Flowers.* H. T. Malby.
26	Photographic Club	*Photographs Old and New.* Thomas Fall.
26	Southport	*Retouching, &c., for Amateurs.* George Cross.
27	Aston	Pond Life.
27	Ireland	Annual Meeting.
27	London and Provincial	Open Night.

ROYAL PHOTOGRAPHIC SOCIETY.

May 18,—Photo-mechanical Meeting,—the Earl of Crawford, K.T. (President), in the chair.

The Absorption Copying Process, or Playertype.

The Assistant Secretary showed some prints—copies of line engravings, pencil drawings, and silver prints—produced by Mr. J. H. Player's "absorption" process, and lent to him by that gentleman for exhibition. In producing the prints, the engraving or other object is laid face upwards on a piece of black paper or velvet, and in contact with the film side of a sheet of bromide paper. The latter is covered first with plate glass, and then with green glass, and light is allowed to pass through the glass and *through* the bromide paper on to the engraving, the object to be copied being thus *beneath* the sensitive surface instead of above it, as in ordinary processes. The bromide paper, being developed as usual, yields a negative the exact size of the original, from which positive prints may be made. It was stated that exposure had been made in most cases to the light of a Welsbach burner at a distance of two feet, and the Assistant Secretary was unable to give details as to time, &c.; but we may add that Mr. Player has stated that he found that the best results were obtained by using such a combination of film, light, and glass, that from twenty to thirty minutes were required to take the negative, and that, up to November last, he had been unable to obtain equally good results with less exposure.

The President suggested that the process would be very useful for the reproduction of old manuscripts or drawings which had been creased or crumpled, as the creases would not be reproduced as in copying in the camera. He was not sure, however, that it would be safe to put valuable documents in contact with bromide paper.

Mr. L. Warnerke said there would be no risk in that case, but it would not be safe with printing-out paper.

The Rev. F. C. Lambert said he had repeated Mr. Player's experiments with a fair amount of success, sufficient to show that the process was practicable, but he did not use any green glass.

Mr. Sanger Shepherd said a negative could be developed by shutting a piece of bromide paper in a printed book for a few minutes, without any light action at all.

Photo-aquatint.

Mr. Thomas Huson, R.I., forwarded some *Notes on the Working of the Photo-aquatint Process, and on some of the Apparatus used*, which were read by the Hon. Secretary. The best class of negative for the process was one full of gradation and of such a kind as would yield a first-class transparency by the method selected. The author frequently made his transparencies by the carbon process, using transparency tissue, which, however, with his method of etching, required to be strongly intensified with permanganate of potash; but he much preferred plates coated with emulsion of the lantern-slide type, either of gelatine or collodion. For the resist, the Autotype Company's autogravure tissue was employed, sensitised in the usual manner, and dried in a drying box containing chloride of calcium; the tissue, which should be used while freshly sensitised, was too dry when removed from the box, and should be allowed to become very slightly damp before use. The method of cleaning the plate was described, and the construction of a special dusting box was illustrated by means of diagrams. The author had experienced much trouble with "devils," and after a number of experiments succeeded in exorcising those obnoxious appearances. He attributed "devils" to punctures in the film of the resist, allowing the etching solution to find its way to the copper with greater readiness than in the unpunctured portions, and to obviate them he coated the freshly grounded plate with a solution of bichromated gelatine of sufficient strength to form a film which should effectually cover it, and not too thick to interfere with the definition of the picture. The gelatine solution consisted of—

Nelson's No. 1 gelatine	120 grains.
Bichromate of potash	6 ,,
Water	9 ounces.

After filtering, the solution was applied to the warmed plate, and exposed to light to render the film insoluble previous to the attachment and development of the resist. Instead of following the usual method of employing several etching solutions of different densities, one bath only should do the work from beginning to end, without stoppage; but, to work with one solution, the transparency, resist, and etching must all be adapted to each other in order to produce range of tone and gradation. He used an etching solution of perchloride of iron at a strength of 38° Beaumé (temperature 74° to 76° Fahr.) in the proportion of about one drachm to every square inch of surface to be engraved, the time of immersion averaging thirty-five to forty minutes.

Considerable informal conversation followed the reading of the paper, in the course of which "devils" received a considerable share of attention.

The Rev. F. C. Lambert thought they were sometimes due to the presence of impure particles in the bitumen, which cut through the thinnest parts of the gelatine in squeegeeing, or to the collection of dust upon the tissue, preventing the outer surface being acted upon by light. It was thought by some workers that impure copper caused them, but he had not had a more plentiful crop with cheap copper, used for making copper kettles, than with more expensive samples.

The method of etching with one solution came in for a good deal of criticism, but Mr. J. A. Sinclair said he had consistently followed Mr. Huson's plan without difficulty, and with every success.

Mr. T. Bolas said that Mr. Palmer, about 1835, placed upon the market some electrolytic plates, and suggested that a repetition of the experiment would be opportune at the present time, having regard to the existing condition of the copper and electrical industries.

Messrs. Gear, Warnerke, Fry, Shepherd, Bolas, Lambert, Gamble, and others took part in the conversation, which was closed at a late hour by a vote of thanks to Mr. Huson.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 13,—Mr. A. Haddon in the chair.

Negative-making.

Mr. Chapman Jones, F.I.C., F.C.S., read a paper on the above subject, being one of the Affiliation series. The first step was to secure a truthful image upon the screen. Distortion of outline was due either to the lens, the sensitive surface, or the intervening medium—the air. It is the first two which have to be particularly regarded. The paper then discusses the distortions of outline as given by various lenses, the effect produced by the position of the diaphragm stop, and the other principles concerning the formation of the image. Diagrams to illustrate the several points were shown. Distortion due to the flatness of the plate was also dealt with, as also the complex effects of sloping the same. To sum up, three rules are given as applying to the photography of solid objects: (1) The plate must be kept perpendicular; (2) do not include too wide an angle of view; (3) keep far enough away from the subject. Exposure, development, and fixing were then considered. Favourable mention was made of Watkins's exposure meter for determining the exposure. People were deceived in supposing themselves able to judge the required exposure by examining the appearance of the screen image, the eye, of course, adjusting itself to the intensity of the light. A perfect negative was described as one composed of pure metallic silver, embedded in clean gelatine. Some thought the image of a dirty negative, consisting of the mud of oxidised pyro in addition to the silver, possessed advantages over the one described in printing qualities. This might be so in the case of starved plates, where something was required to help the silver, and in the case of such a short exposure that, after the whole of its effect has been used up, the image was too weak. Better to avoid this condition. Clearing solutions, while lightening the colour of stained negatives, were described as fixing it in the film. Carbonate of soda was preferred for the alkali, being more constant than ammonia, which was volatile, and subject to gradual weakening. Selective and exhaustive development was discussed. No special reducing agent was recommended, but hydroquinone was thought unsuitable, amongst other reasons being its tendency to cause frilling. The addition of sulphite and carbonate to the fixing bath was recommended. Acid baths should be avoided, tending to fix the stain. Washing should be final, and not after each operation. Mr. Chapman Jones said it was false reasoning to argue that any negative giving a good print was perfect. Its composition should be definite, enabling subsequent operations to be carried out with confidence.

Mr. P Everitt, whilst agreeing to a large extent with Mr. Chapman Jones's remarks, thought that his definition of the perfect negative was a purely arbitrary proceeding, and his own view differed from that considerably. The perfect negative, in his opinion, was the negative that gave a perfect positive, and consequently one need not confine himself to pure silver and clean gelatine. It had been said that one should have a negative of which its composition was clearly known; but was it possible to secure such a negative as that described? For himself he would be inclined to go for this so-called "mud," in which there was a great deal of virtue. It was, in fact, stain, and it possessed this advantage over a silver deposit in that it had no grain. An authority on enlarging gave the preference to a yellow image for that purpose, and there might be some sound judgment in it. If possible, he would like to get a negative consisting totally of this stain, and said such a negative would be far more perfect than Mr. Chapman Jones's perfect negative. In the yellow negative we have, besides the silver, pyro stain locked up in the insoluble gelatine, produced in either of two ways, the action of the liberated bromine or the tanning of the pyro (a debatable point), and, if an image of this stain could be obtained, he would be willing to say good bye to the silver. With reference to the plate being more or less rapid, according to the developer used, a large field was opened up. If developers were allowed full time for action, would there be any difference in their reducing power? There were many factors to be considered, and we should rather say that the developer was more or less energetic than the plate more or less rapid. As regards the discontinuance of the use of ammonia on account of the uncertainty about its real strength, the latter was easily to be regulated by employing one of Mr. Haddon's bulbs. Mr. Chapman Jones had spoken of the use of the brush in development as being not photography. Now, what was the difference between using a brush and selecting your developer, or using the developer for a greater or less time? A brush was quite admissible.

Mr. E. J. WALL joined the last speaker regarding the "perfect negative." A perfect negative, he thought, was that which gave the impression of the subject as seen by the operator. He agreed that it was wrong to attempt to judge the exposure by an examination of the image on the screen. Mr. Everitt had expressed a desire for a negative of pure "mud." Well, it was quite easy to obtain. Mr. Watkins had shown strips developed with pyro from which all the silver had been extracted, leaving a distinct stain image. He himself had a negative which at one time took four or five days to print in bright weather on printing-out paper, being of a deep orange colour. By removing all the silver, it was now possible to get a decent print in about two hours purely from the remaining stain. There was no doubt that the stain was deposited in the same ratio as the silver; it could be proved. He dissented from the opinion that "mud" was used by photographers when they worked starved plates. It did not matter whether one had a large or small quantity of silver in the plate. The density of the image was due to the physical condition of the silver in the image. Clearing solutions were described as only serving to lighten the colour; but what did it matter if by that means the stain did not act? He always upheld that hydroquinone tended to hardness. During a long connexion with amateur competitions, he could tell at once the hydroquinone-developed negative, his percentage of success being about ninety-five. Speaking of varnishing, there was a method in which a thin sheet of celluloid was dissolved in amyl acetate, and coated upon the negative. It took about twenty-four hours to dry, but was easy to use.

A discussion took place as to the use of acid, neutral, or alkaline fixing baths, and the advisability or otherwise of washing between development and fixing.

Mr. HENDERSON said it was a decidedly bad thing to omit the washing.

Mr. WALL never washed, on the other hand, but used an acid fixing bath, which neutralises the alkali of the developer, and stops development.

Mr. HENDERSON inquired what disadvantage there was in his method.

Mr. WALL replied that, having obtained the desired density in a negative, it was required to stop the development instantly, and he knew of no better way than by the acid bath mentioned; certainly the water would not do it.

Mr. MACKIE did not like the offensive term of "mud" applied to the stain. It was clearly not scientific.

Mr. CHAPMAN JONES, in reply, said the term "mud" was not his own invention, and, although not specially good, it was a sort of classic term which he adopted. The acid fixing bath, besides fixing the stain, hardened the film, retarding fixing, and slowing the washing afterwards. He said that he had devoted himself to the photographically produced negative, and thought the brush, however good it might be, was out of place. Regarding the suggested negative of pure stain, it was very uncertain; the longer the washing the less stain remained, but it might serve for a temporary negative.

Mr. Chapman Jones was heartily thanked for his paper and reply.

Mr. DRAGE called special attention to the invitations to the Yarmouth Convention lying upon the table.

PHOTOGRAPHIC CLUB.

MAY 12,—Mr. W. Thomas in the chair.

Mr. GEORGE TOTTEM asked for suggestions as to the cause of the faults exhibited by a bromide print which he passed round. The print was apparently fogged in what should have been the whites of the picture.

Mr. THOMAS suggested that the photographer had been endeavouring to make a composition print, and that it had failed.

Several members thought it was impossible to state the probable cause without seeing the negative.

Mr. TOTTEM said there was no fault in the negative, as prints exposed by the same person, but developed by himself, were not failures.

Mr. FRY said he had no doubt that the print had been exposed to actinic light whilst the developer was in the film; it might be between developing and fixing, or in the fixing bath.

The Hon. Secretary passed round prospectuses of the photographic section of an International Exhibition to be held at the Royal Agricultural Hall from June 22 to 30. The feature of the Exhibition appears to be that professional photographers are not only eligible to compete, but that there are classes which especially appeal to them, such as portraiture, figure studies, enlargements, and finishing in black and white and colours. There is also a photomechanical section. Mr. W. E. Aylwyn, of 27, Leadenhall-street, should be addressed for full particulars.

Attention was drawn to the fact that two weekly journals had issued unofficial reports of the Club's meeting, and that this was not an acceptable proceeding to the members of the Club.

Mr. FRANK HAES showed work made on Wellington's negative paper. He found the sensitiveness to be approximately 110 H. & D. The results were rather granular.

Mr. DRAGE said that Mr. Wellington had advised, in his earlier instructions, that the back of the paper should be exposed to light for an infinitesimal time. The object was to reduce the grain. It was thought that it would be difficult to carry this out in practice.

A general discussion ensued upon the subject of negative paper, its preparation and use.

Mr. FOXLEE mentioned that Mr. Ratcliffe, formerly a member of the Club, had some collodio-albumen plates which were exposed about twenty years ago. He intended to develop some of these in the presence of a committee of photographers in order to verify the results.

Mr. BRIDGE stated that he had received a parcel containing an early instantaneous shutter, which the donor stated he intended for the Club museum. As, however, his name was not disclosed, all that the meeting could do was to thank the anonymous person for his kindness.

Hackney Photographic Society.—May 11, Mr. E. Puttock presiding.—Excursion announcements and reports were made by the EXCURSION SECRETARY. Members' work was shown by Messrs. Dunkley and Williamson. Mr. Prestwich showed his new camera for animated pictures. The chief advantages claimed over others of the kind were portability, no intermittent motion, rotary movement, perfect registration between each picture. The instrument was an exceedingly neat one, being no larger than a hand camera. In reply to inquiries, Mr. PRESTWICH said that it could be used both for taking the negatives and printing the positive transparencies afterwards, and it could be used for projection.

North Middlesex Photographic Society.—May 10, Mr. Mattocks in the chair.—Mr. W. E. DEBENHAM, to illustrate a

PLATE-BACKING CONVENIENCE FOR AMATEURS,

showed a drying box, made out of a small packing case, so constructed that a current of air could pass through without light getting in. This was done by overlapping ledges round the lid and top of box, which were covered with velvet; a bottle filled with hot water was placed at the bottom of the box, and a frame on which to stand a rack over this. When the lid is shut, the air gets in at the bottom, is heated by the bottle, and facilitates drying the plates, and escapes from the top. The box was examined with interest, a general discussion on backings took place, and Mr. Debenham detailed some experiments he had made by backing one side of a prism and photographing through it. Those containing caramel as a basis were found to be the best.

MAY 17, Mr. H. Smith in the chair.—Mr. GOODWIN gave a lecture on

THE CAMERA AND ACCESSORIES, AND THEIR MANIPULATION IN THE FIELD.

This was an Instruction Evening and specially intended for beginners. The lecturer described the use of the various parts of the camera, the method of focussing, and the use of stops. He told how to choose a view, and to allow for the difference in the appearance in colours on the screen and after its translation into monochrome. The lecture was followed with interest by some members who had only recently taken up photography, and several questions were put. A general discussion afterwards took place on focussing, as to whether, on stopping down a lens, the focus was deepened to the same extent before or behind the object focussed. Mr. CHILD BAYLEY and Mr. MACINTOSH and others said that there was a difference; objects behind became to a greater degree in better focus than objects in front of point focussed. The results in the Outings Competitions to Wickford and Northwood resulted in Mr. Goodwin gaining first place for the former, and Mr. H. Smith for the latter.

Bradford Camera Club.—May 13.—Mr. W. T. WILKINSON (President of the Wakefield Photographic Society) gave a lecture and demonstration on

CARBON PRINTING.

Mr. Walter Booth (President) occupied the chair, and there was a good attendance of members. Carbon printing was described as a process which is rather neglected from a mistaken idea of difficulty. The process is absolutely permanent, most economical, and beautiful. The tissue is sensitised by being immersed in a solution of bichromate of potash, which, under the action of light, renders the gelatine in which the pigment is contained insoluble. The sensitised tissue is exposed in the ordinary way under the negative, but, as the action is not visible, use must be made of an actinometer to get at the light value. To develop the print, hot water only is required at a temperature of about 110 Fahr., or say just as warm as the hand can bear comfortably, when the soluble gelatine is dissolved away in more or less degree according to the density of the various parts of the negative. All the prints then need is to be immersed in a weak solution of alum to harden the film, and then rinsed a few minutes in cold water. There are no chemicals required beyond the alum. The process is simplicity itself, and has the great advantage of being reliable, and of always being sure of repetition of tone or colour. A number of questions were asked, and answered by Mr. Wilkinson, to whom was accorded a hearty vote of thanks, on the motion of Mr. W. H. Dawson, who was unanimously elected a Vice-President of the Club.

FORTHCOMING EXHIBITION

1897.

December 9–11 .....*Aintree Photographic Society.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE COMING CONVENTION.

To the EDITORS.

GENTLEMEN,—I do not intend this letter to represent a scarecrow, *au contraire*, I assure you; but I would like to ask the Yarmouth authorities, through the medium of your pages, the following question, "Will it be a difficult matter for visitors to obtain lodgings?" I have many reasons for asking this question. All the people that I have spoken to (who *know* Yarmouth) anent the Convention shake their heads, and wonder where visitors will get to during that July week, for, be it remembered, Yarmouth is, without doubt, the most thickly populated seaside place in the United Kingdom. The Convention hitherto have had no experience of such a modern Babylon as their headquarters. People, I have heard, who do not get their quarters some time in advance, stand no chance of getting respectable lodgings at all. Many, I am told, have had to pass the night in, or under, bathing machines, or get under the friendly (?) wing of a policeman, and be taken to the police-station or

workhouse. (Who suggested fire-station?) I would recommend all who go "on the hop" to take with them an extra-size dark-room tent, or buy a small army tent second hand (they may be got for about 6*s.*), and rig up the same on the racecourse, should they fail to obtain suitable rooms. The Convention, located in tents, in the workhouse, police station, or bathing machines, would, no doubt, be a novel sight.

Do such difficulties in the matter of lodgings really exist? While such rumours are current, many, I fear, will fight shy of Yarmouth, especially if they do not know until the last minute whether they will be able to go or not. If business permit, I shall be there, even if I have to sleep in the sand, or, should the weather be hot, in an ice-cream barrow. —I am, yours, &c., P. R. S.

Cambridge.

OPERA-GLASS CAMERA AT THE VICTORIAN EXHIBITION AT THE CRYSTAL PALACE.

To the EDITORS.

GENTLEMEN,—The opera-glass camera, shown by Mr. A. G. Taylor, struck me as one of the neatest exhibits in the section; but, so far as I can see, it is without any shutter, and therefore I am at a loss to see how it is to be used. Some time ago I had one of apparently identical construction offered to me, but, as I saw no means of exposing (except to cap), and the would-be vendor could not give me any help, I was obliged to return it. Perhaps Mr. Taylor, or some other of your readers, will enlighten us as to how the camera was, or was intended, to be made.—I am, yours, &c., CHAS. LOUIS HETT.

Springfield-buildings, Brigg, May 12, 1897.

THE CRYSTAL PALACE EXHIBITION.

To the EDITORS.

GENTLEMEN,—I notice in your last issue you propose giving fuller details of exhibits and methods in future articles. I am just writing to say that I shall be pleased to supply any particulars you wish *re* the latter. I do not know whether a large photograph on wood panel, fitted up as a part of a room, dado and frieze, has been labelled yet. This, my father had a great idea, could be utilised for room, ship cabin, and furniture decoration. This is produced by his later method of printing in oil colour dried from the negative, so that there there is nothing between the photograph and the wood to make it liable to crack. The copy of Da Vinci is produced by the same process on paper without a transfer, and has much of the bloom of a good engraving. The little view of Tintern is by the same process, but by a transfer on to the cardboard.

In referring to his earliest carbon prints since, I should be glad if you would call attention to the fact of the letter attached to these from Dr. Becker, Secretary to H.R.H. the Prince Consort, because it not only confirms the date, but shows the interest he took in photography, as it will be remembered by many he, after this, subscribed 10*l.* towards the small fund raised for my father to make his process public. Perhaps these few details may be of some assistance to you.—I am, yours, &c.,

Dorchester, May 17, 1897. WALTER H. POUNCY.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Louisa Fennell, Westgate, Wakefield.—*Sketch of the old bakehouse, Westgate, Wakefield.*

Brunskill & Co., Lake-road, Windermere.—*Two photographs of Esthwaite How, Hawkeshead, Lancashire.*

William P. Coleman, 3, Station-road, Faversham, Kent.—*Photograph of specimens of real Whitstable natives.*

Brunskill & Co., Lake-road, Windermere.—*Photograph of view, exterior of Esthwaite How, Hawkeshead, Lancashire.*

RECEIVED.—TRAPP & CO.; LICHTENSTEIN & CO.; CADETT & NEALL; W. TYLAR. In our next.

F. K. H.; C. E. G.—Received and contents noted.

T. SCOTT.—The address is 44, Hatton-garden, E.C.

R. T. FORD.—It is a secret process, of which no information that we know of is available.

W. SIMONS.—Apply to the Secretary Science and Art Department, South Kensington, S.W.

APPRENTICESHIP.—A. E. B. asks: "Would you be so kind as to answer the following question: If a youth of nineteen be apprenticed to a business with the ordinary apprenticeship indentures, is he, on coming of age, still legally bound by those indentures?"—The apprenticeship expires on the apprentice reaching the age of twenty-one.

ENAMELLED PRINTS.—H. HALE. Enamelled prints, if they are kept long in a damp atmosphere, we should expect, would lose a considerable amount of their gloss. Damp does not suit gelatine prints, or, indeed, any others that are printed in silver.

COLLODIO-CHLORIDE PAPER.—C. C. SPEC asks: "Would you kindly give me your opinion of the pink tone round the margin and background of the enclosed C.C. print? It is toned in the standard formula (sulpho cyanide) bath. I have worked this bath and paper the last three years, and never been troubled like this before."—The print seems to have been exposed to too strong a light while in the toning bath.

MR. WYLLIE'S LECTURE.—M. W. R. says: "On page 172 is a condensed report of a lecture on picture-making, by Mr. W. L. Wyllie, A.R.A., before the Royal Photographic Society. Would you kindly give me the following information in your next issue: If I can get a verbatim report? if so, where, and how much? I am not a member of the Royal Photographic Society."—Send 1*s.* to the Royal Photographic Society, 12, Hanover-square, and you will obtain the lecture in full.

COLLODION EMULSION; PROCESS WORK.—Q. Z. asks: "1. Can you oblige me with a formula for a collodion emulsion, such as would answer for ferrotype dry plates, like Nievsky or Cheron produces? 2. Titles, prices, and publishers' names of a couple of good books on process work, suited to the pocket of a poor man? Am an old wet-plate worker (1873)."—In reply: 1. We are unable to give you the formula by which either of the plates mentioned are prepared. Probably one or other of the formulæ given in the ALMANAC can, with experiment, be modified to suit. 2. Burton's book, published by Marion & Co., and Wilkinson's, Iliff & Co.

MISS B. H. HEATHCOTE.—We do not know of a work exactly meeting your requirements, but we believe Mr. L. Upcott Gill, of 170, Strand, publishes a book specially devoted to hand-camera photography, which may give the necessary information as to manipulation. With regard to the climate mentioned, we think your friend had better have the camera specially constructed, and we recommend her to go to a good maker, giving him full details as to the conditions under which the instrument is to be used. A little photographic experience in the circumstances you describe will probably be of greater assistance than any written instructions. Write again if we can be of further help.

EMULSION; DRYING PLATES.—EMULSION writes: "*Re* an article in your ALMANAC, 1896, *Extemporaneous Dry-plate Making*, do you think that there is a good opening for offering a good emulsion for sale by advertisement in your and other papers? I have been making and using a first-class emulsion (Dr. Eder's ammonia-nitrate formula). 1. Would 1*s.* 3*d.* for a two-ounce bottle, ready-washed, be a reasonable price? 2. Is there any way to dry fresh-made plates quickly? I have a drying cupboard, but that does not seem to answer very well."—We fancy that, if amateurs would take the trouble to clean and coat their own plates, they would also prefer to make their own emulsion. The proposed price seems reasonable. If the cupboard were properly constructed, the plates would dry quickly. Probably it is not made on the right principle.

SENSITISING BATH.—NEPTUNE writes: "Would you kindly let me know the best way to work a sensitising bath, as I have always been used to having it made up for me ready for use; but now I have changed my place, and my new master has shown me how to strengthen the bath, but he sometimes adds a little bicarbonate of soda to neutralise, as he says, and, as I am expected to do the same, I beg leave to ask you if it would do any harm if I put in too much? How often should it be added (he used to do so after each two or three days' printing), and would it have any effect on the toning bath if there was too much soda put in? It is an acetate bath, and is turning very dark red within the last few tonings only."—Unless the paper used has an acid reaction, it will not render the bath acid; hence it will not require to be neutralised. If that is necessary, litmus paper will indicate when sufficient bicarbonate of soda has been added. An excess will not do much harm, as it will precipitate carbonate of silver, which will be filtered out. Probably the toning bath has been exposed to light.

VARIOUS ENAMMO puts the following seven queries: "Would you kindly let me have answers to the following questions regards starting business on one's own account? 1. I would like to know if it is possible for me to get a show of specimens (as, of course, I have none). If possible, where and at what price? 2. Could I get a book of choice positions, groups, children, &c., to copy positions from? Where, and at what price? 3. The studio being twenty-four feet, and want to work from 10×8 to full-length *carte-de-visite*, three-inch figure, what lens and camera would you advise me to get? I would require rapid lenses, as I wish to push trade in children, and would you know from whom I could get them second hand? 4. What sized backgrounds at cheapest price could I get (indoor and out), and how many would I require? 5. Kindly let me have an idea what accessories and furniture (indoor and out) would do to start with? 6. What firm would you advise me to deal with for all, and what colour of blinds would you recommend for studio? 7. You might let me have any information you know of which I have not asked for, but which would be of great service to me just now."—In reply: 1. Yes, probably by advertising for them; but would it be honourable or honest to exhibit them as specimens of your own work? 2. We know of no such work. 3. Lenses of from eight inches to eighteen inches equivalent focus of the Petzval form. Consult the advertising columns for second-hand goods. 4, 5, 6, 7. It is against our rule to recommend any particular manufacturer's goods. We would suggest, as our correspondent seems to know very little, if anything, of the photographic business, that he seeks the advice of some professional photographer to assist him. Of course, in the limited space of this column, we can give no such information as he is in need of.

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EX CATHEDRÂ.

Mr. A. L. Henderson has recently returned from his annual Continental sojourn with a large number of photographs taken in the Riviera and elsewhere. Among these are a selection obtained at Cimiez, where the Queen was lately residing, illustrating the simple life led by the Sovereign when the cares of State are temporarily laid aside. Afternoon tea in a secluded part of a wood appears to be a favourite pleasure of the Queen, and Mr. Henderson was privileged to use his camera on this and other incidents of the Royal stay in the Riviera.

* * *

Colour photography in its latest stages of development is to be brought before the Great Yarmouth meeting of the Photographic Convention, examples being expected illustrative of the processes of Ives, Joly, Chassagne, and Bennetto. Mr. Bennetto informs us that he is at present working out some improvements in his process, and does not intend to exhibit any more examples of the old method. The working details of the improvements are not quite complete, but there appears some probability of the members of the Convention having the opportunity of seeing the results in July next.

Photography is just now offering a somewhat fertile field for the cultivation of limited liability companies, and, besides those already recently formed, others may shortly be expected. The latest prospectus that has come before us is that of the Photo-enamel Syndicate, Limited, which, with a capital of 20,000*l.*, is formed for working the process, referred to in these pages a fortnight ago, of fusing photographs in vitrifiable colours on enamelled iron and similar supports. According to the prospectus, a large and profitable scope is anticipated for the operations of the Syndicate in these enamel photographs for advertising and art purposes. Fifteen thousand 1*l.* shares are offered for subscription. The offices of the Syndicate are at 88, Bishopsgate-street Within.

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Herr Gustav Schnitzler, of 31, St. Anna-straat, Nymegen, in the kingdom of Holland, has made the discovery that photographic positives may be printed on flexible celluloid, and, with all the pride and confidence of the inventor, has obtained patent protection for his invention. We print the specification of the patent in full. "My invention relates," he says, "to the production of photographic positive pictures upon transparent flexible material, which may either be colourless or tinted, which pictures give the same effect when examined from either side, do not require to be mounted, and are very permanent and resistant. In these pictures the material to be printed upon in the usual manner by the superimposed negative can be kept ready exactly as in the case of the ordinary positive paper in large sheets or in specially cut sizes. The material which I make use of for this purpose consists of transparent celluloid, which is rolled into plates of the thickness of a sheet of paper, and may be either colourless or of any desired colour or tint and which bears the sensitive film. The treatment of the positive in respect to the exposure, development, and fixing, is in all stages similar to that in the positives of the usual kind."

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Could anything more effectively illustrate the absurdity of the British patent system than that any one nowadays should be allowed to "patent" the production of transparencies on celluloid? And yet many of our contemporaries and several patent agents of repute not only defend these obviously imperfect patent laws of ours, but attack us whenever we call

attention to the many gross absurdities they give rise to, of which the instance we quote is one of the most frequent.

* * *

In view of the recent regulations of the Home Office and the fire insurance companies regarding acetylene and the storage of calcium carbide, the latest news on the subject, from America, may prove of interest. It is stated that the Philadelphia Fire Underwriters' Association has decided to grant permission for the use of acetylene gas in liquefied form under pressure for lighting purposes, provided that the pressure of gas on the piping in the building to be insured shall at no time exceed a quarter of a pound per square inch, and that the cylinder containing the liquefied gas under pressure and all pressure-reducing and safety devices be located outside of such building, and in a separate building well ventilated to the outer air, but of sufficient strength to protect the apparatus from outside interference and from the weather (especially the sun's rays), and that the supply pipe for the building be provided with a hand valve just inside of the building insured, so that the gas may be entirely shut off from such building. It is also provided that the cylinder containing the liquefied gas under pressure shall be equipped with a safety valve, to protect against both excessive pressure and unusual increase of temperature, and that both the pressure-reducing and the safety (mercury) valves shall be provided with vent pipes opening into the outer air, and that no acetylene gas or calcium carbide shall be stored on the premises.

* * *

We have been asked to note that Mr. A. Martin, the well-known photographer of Wanganui, has just introduced and patented what is described as "a very striking novelty (?) in photography," one which is quite in advance of anything of the kind hitherto attempted. "The pictures are produced in relief, varying in depth from the eighth of an inch to fully half an inch, according to the subject and size of the picture. This bas-relief process is not confined to portraiture, but can be applied to many different subjects. A very realistic picture of Mount Egmont, done by this process, is now on view at Mr. Martin's studio, and his staff is busily engaged in applying the process to a variety of classes of work. Mr. Martin is securing patent rights throughout the world." There appears to be quite a revival in bas-relief photography in various parts of the world. Its novelty may be judged from the fact that there is at this moment at the Crystal Palace Victorian Exhibition an example at least twenty-five years old.

* * *

Mr. J. B. Carruthers, of the Cranford Press, Chiswick, informs us that the business and premises of the late firm of Allen & Carruthers have now become his sole property. He purposes trading under the style of "The Cranford Press," and states that the same attention as hitherto to quality and artistic merit of production will be a primary consideration.

* * *

The Photochrom Company inform us that they have removed their offices and showrooms, on account of the great extension of their business, from 61 and 63, Ludgate-hill to 121, Cheapside, E.C.

* * *

Messrs. Newman & Guardia inform us that the rapid growth of their business having demanded greater accommodation than they possessed at 92, Shaftesbury-avenue, W., they have now added the whole of the adjoining premises, No. 90. The combined premises have more than doubled the space at their disposal. The premises comprise general and private offices, a large general showroom, a special showroom for optical projection instruments, a well-appointed dark room, packing and storerooms, &c. The projection room will place them in a position to show all their specialities in instruments for optical projection. These comprise, amongst other things, kinematographs, optical lanterns, arc lamps, oxyhydrogen jets, enlarging cameras, reducing cameras, films for kinematographs, lantern slides, and sundries. The projection room will also be fitted with an accurate shutter-testing machine.

* * *

Messrs. E. H. Fitch & Co., of Fulwood's Rents, Holborn, are making a speciality of films for animated photography, for which they are experiencing considerable demand at home and abroad. They recently submitted to us, for our inspection, specimens of coated, unexposed films, upon which the emulsion appeared to have been spread with singular evenness and regularity. Negatives and positives on the films were also shown us, and the quality of these images was exceedingly good.

* * *

At the Imperial Institute, South Kensington, the City and Guilds of London Institute have arranged an Exhibition of specimens of practical work of candidates at the Technological Examinations, April–May, 1897. The exhibits will be on view between 2 and 7 from May 28 to June 5.

* * *

Telegrams from Chicago state that the Yerkes lens, the largest in the world, having been set in the telescope constructed for it, was used for the first time on the night of Friday, May 21, the first object upon which it was turned being the planet Jupiter. President Harper, of Chicago University, said he expected great results from the lens, and that "their knowledge of the periods of rotation of Venus and Mercury would be increased, and that new features would be discovered of the asteroids, the moons of Jupiter, and the rings of Saturn and other heavenly bodies." The telescope enables the moon to be studied with unusual detail.

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According to the daily newspapers, another alarming fire broke out in Paris, on Monday evening, at six o'clock, in the premises occupied by the Cinematograph Company in the Boulevard Poissonnière. The accident was caused by the inadvertence of a young operator, M. Léon Roussin, who misplaced several of the glasses (? films). Happily, it being the hour when business is slack, only thirty spectators were in the show, looking at a picture entitled *The Nightmare*. The panic was therefore lessened. The Prefect of Police has stated that grave steps will have to be taken to protect Paris from the increasing dangers of the cinematograph.

* * *

Photographers as well as pugilists will, doubtless, be interested to learn that the kinetoscope pictures of the fight between Corbett & Fitzsimmons were shown at the Academy of of Music, in New York on Saturday evening, May 22, the hall being crowded. Great interest centered in Corbett's declaration that Fitzsimmons struck a foul blow at the end of the

fight, but the pictures showed that everything was fair. Clearly, therefore, the lens and the sensitive film observed the veracities whilst Mr. Corbett did not. We suppose that these animated photographs of a very severe contest will shortly reach this country, and be rapturously received by supporters of the "noble art."

PHOTOGRAPHING GROUPS.

In no branch of photographic technics more than in the taking of groups of people has the introduction of the Jena glasses brought about such important changes of methods as modern lenses render possible. Till quite recently, if it were desired to take a portrait group, the work was hedged in with so many difficulties and restrictions that, not infrequently, no satisfactory result was obtainable. Did we wish to work with a quick exposure, a standpoint removed to a considerable distance, sometimes impossible to obtain, was a necessity, for the lens was not made which, with full aperture, covered sharply to the edges a plate whose length in any way approached the length of the focus. To work to that extent, a very small diaphragm had to be used, with the concomitant increase in exposure. True, this increase is minimised by the general acceleration in the speed of plates as now made; but, even allowing for such a gain, the advantages are all on the side of the new lenses, which cover sharply and with full aperture an area with a diameter equal to the focus of the lens.

Then, again, unless an almost microscopically small diaphragm was used, so as to make the depth of definition almost infinite, very great care had to be taken to arrange the figures so that their front line assumed a horse-shoe shape, flat fields being unknown, the only way of getting all the figures in focus with full, or nearly full, aperture being so to arrange them by bringing the outer figures near enough to lengthen the focus of the outer pencils that they came to a point in the same plane as those in the centre. One consequence of this arrangement was that, if sharpness was aimed at, the figures near the edge of the group became very disproportioned, sometimes ludicrously so. While on this topic, it is well to point out a fact which is very frequently lost sight of, if not actually unknown. Naturally, it is not every photographer who is provided with brand new lenses; in fact the conservative instinct of the old practitioner leads him to prefer his old and tried friends, his lenses, and to disbelieve that there can possibly be anything better; and to these users it is that our more immediate remarks apply. Most photographers are aware of this necessity of grouping figures along a curved line to get them sharp towards the edges; but, where the lack of knowledge, or, what amounts to the same thing, its application, comes into force, is when the group is a very large one, or widely spread from right to left, and the camera is at a considerable distance away. Under these circumstances it would be necessary, if the curve formation is to be utilised to flatten the field, for the outer figures to be brought so much nearer, that they would appear as giants compared with pigmies in the centre. The curve formation is only available when the subjects are comparatively near. Without mentioning names, which would be invidious, many Conventioners will have a lively remembrance of one large group, spread over a large area, which was being photographed by the operator of a well-known firm. He kept shifting and arranging his figures with this curve idea obviously in his mind, and, equally obviously, he was all at sea. They would not focus, and the photographers present were subject to the infliction of seeing a professional photographer spending at least ten minutes or a quarter of an hour focussing a group which should be easily done in a minute by one who knew his way about.

As one well-known man said at the time, "Why, his lens has only one focus for that distance; what is the man bothering about?"

This leads to the consideration of another useful point in the selection of lenses. When the standpoint is once fixed, as is often the case in commissioned group work, the focussing should be done before ever a sitter comes on the spot. The size of the picture to be taken governs much more important considerations than the cost of the plates or the expense of a large lens. With a standpoint so fixed the larger the picture to be taken the less the "depth of focus" (with equal exposures). If the subject be a crowd at a distance, this is immaterial; but, if the subject be a smaller set of figures nearer to the camera, it will be far more difficult to get a good focus with, say, a twenty-inch lens than with a six or seven-inch.

Therein lies one of the advantages of the hand camera. With a focus rarely exceeding five inches, everything is in sharp focus with full aperture when beyond a few yards from the front of the camera. If a fifteen or sixteen-inch plate has to be covered and many planes are included, so small a stop must be used that very quick exposures are out of the question.

If we were called on to summarise the best conditions for group-taking, we would say, first, a lens of modern construction; next, one of a small focus, in other words, intended for a small plate; and, finally, absence of direct sunlight, either through the sitters having their backs to the light, or, still better, the presence of clouds to obscure the sun. Lastly, it must be noted that, if the group be taken against the sun, no satisfactory result will be attained unless the lens have a perfect sunshade.

THE RELATIVE COLOUR SENSITIVENESS OF SILVER IODIDE AND BROMIDE.

In our obituary of the late Mr. Carey Lea allusion was made to his experiments in connexion with the colour sensitiveness of iodide and bromide of silver, published as far back as 1875, and resulting, as we pointed out, in the deduction that iodide of silver was more sensitive to *all* rays of the spectrum than bromide, but more particularly to those of lower refrangibility.

These conclusions are so utterly at variance with those arrived at by others, both before and since, and so contrary to the generally accepted theories of the present day, that it is probable, as we previously hinted, that the deceased experimentalist erred in taking too narrow a view of the conditions surrounding the case, and it may not be amiss if we consider the circumstances and his deductions in some detail.

In the first place, the experiments were all made upon paper impregnated with the sensitive salts, in the preparation of which every care and precaution was observed to secure uniformity and avoid error. Carefully selected and pure paper was first floated upon solutions of the bromide and iodide of potassium, these salts being chosen and specially examined for purity. The strength of the solutions was made proportionate to their equivalents, in order that they might take up equal proportions of silver, and the papers were floated for the same period of time. After floating, they were blotted off with clean filtering paper, in order to guard against the unequal distribution of the salt that would occur from hanging up to dry, and, when the surface moisture had been all removed,

they were floated upon a silver bath of thirty grains to the ounce, a fresh portion being used for each sheet of paper, in order to avoid the formation of double salts by decomposition in the bath itself; and, after sensitising, the paper was thrown into a basin of water and washed to remove the excess of silver, except in a few cases, when it was allowed to dry in for special purposes.

Though no mention is made of the time of floating on the silver solution, we assume that so careful an experimentalist as Mr. Lea would take care that in each case it was sufficient to ensure the conversion of the whole of the soluble iodide or bromide present, bearing in mind the well-known fact of the slower formation of the silver bromide. With this one exception the details of preparation would seem to include every desirable precaution, and to be calculated to result in a reasonably uniform and reliable medium.

So much for the preparation of the sensitive surface; now for the conditions of exposure, which, it must be admitted, in spite of the care expressly devoted to them, are open to a good deal of debate, to say the least, as regards their efficiency. Thus the colour effects are obtained by means of coloured glasses rather than by means of the spectrum, as Mr. Lea, without wishing to detract from the value of observations made with the prismatic spectrum, is inclined to believe that those made with coloured glasses, whose absorption spectra have been carefully and exactly made out with the aid of spectroscopic analysis, are at least equally reliable, and in some cases certainly more decisive. He is also of opinion that the prismatic solar spectra as usually obtained are open to the suspicion of not being absolutely pure, but liable to admixture with rays falling on the prism outside the true image of the slit. A very careful prismatic analysis of the spectrum itself would be necessary to detect the presence of faint violet light cast by any such means upon the red end of the spectrum, whereas with coloured glass the detection of any such mixed colour may be effected by a simple inspection of its absorption spectrum. Thus, if a piece of red glass be suspected to pass traces of violet or other light, "it is easy,' says Mr. Lea, "to project any such light that may be present against an absolutely dark field of view, and decide positively on its presence or absence" by means of the spectroscope.

The additional advantages claimed for the coloured-glass method are solely those of convenience. The long exposures necessary with the solar spectrum when operating with the less refrangible rays are, in great measure, avoided, and, owing to the unlimited surface available, a number of comparative experiments can be conducted simultaneously. Then, again, by interposing between the coloured glass and the sensitive paper a suitable negative, as was done in Mr. Lea's experiments, not only is an abnormal discolouration or reduction, in the shape of fog, readily recognised and eliminated, but the distinctness of the image, on development, becomes a measure of the degree of sensitiveness. In these respects, most certainly the coloured-glass methods adopted by Mr. Lea are to be preferred to the prismatic spectrum, if they can really be proved to be as free from error. It would occupy too much space to go into the details of the selection and arrangement of the coloured screens adopted by Mr. Carey Lea, but it will suffice to say that these were arranged and selected by combinations of glasses that excluded all rays except those between certain wave-lengths, the limiting measurements in the case of red and green respectively being such as to practically exclude all rays of higher refrangibility.

Beyond these details there is nothing more to say, except that, after exposure, the slips of paper were developed by means of gallic acid and nitrate of silver, restrained by acetic acid. As to his reason for selecting this particular form of development, Mr. Carey Lea says nothing; but, as we shall suggest a little later, this perhaps has as much as anything else to do with the results obtained.

With regard to the details of those results, we are not here greatly concerned. It is sufficient for our purpose that the general deductions arrived at were, as tabulated by Mr. Lea: (1) AgBr and AgI are sensitive to all the rays of the visible spectrum; (2) AgI is more sensitive than AgBr to all the less refrangible rays, and also to white light; (3) the sensitiveness of AgBr to green rays was materially increased by the presence of free silver nitrate; (4) AgBr and AgI together are more sensitive to both green and red rays (and probably all rays) than either AgBr or AgI separately.

In other words, Mr. Lea's conclusions are practically the very reverse of what we are accustomed to believe, namely, that, with bromide of silver, we possess a power and a sensitiveness to the rays of lower refrangibility that was never dreamt of in connexion with iodide. And it must be borne in mind that this exalted sensitiveness is now no new thing, but has been subject to the test of twenty years' experiment by a far larger body of workers than were formerly available, and it is only reasonable to suppose that, if iodide of silver possessed the advantage claimed for it over bromide, the fact would have been rediscovered before now.

But, in speaking of the absolute relative sensitiveness of two compounds or preparations, we are accustomed to refer to their behaviour under most favourable conditions for either, and it is well known that the conditions most favourable in one case are not necessarily so in another. This appears to be the state of affairs in connexion with Mr. Lea's experiments, and it is rather surprising that the matter should not have struck him in that light. Almost without exception, the conditions of preparation and development of the sensitive surfaces are in favour of iodide and to the disadvantage of bromide. Thus, although iodide of silver is relatively slower to physical development in the washed and dry than in the wet condition in the presence of free silver, the difference it exhibits in these respects is far, very far, less than in the case of bromide, which, under any circumstances, lends itself, with a somewhat bad grace, to physical development of any kind, but more especially to that with gallic acid. If pyrogallic acid or some form of iron development had been substituted for gallic acid, even then the result would probably have been less in favour of iodide than it proved in Mr. Lea's hands, while, if alkaline pyro had been used, most likely, or we may say undoubtedly, the results would have been quite different.

It is not possible without actually trying the experiment to say what would or what would not have occurred under certain conditions, but we think it may be taken for granted that the circumstances surrounding Mr. Lea's experiments were utterly unsuited to the attainment of an accurate decision of the question.

With regard to the alleged sensitiveness of iodide of silver to red rays, these experiments are open to the objection that Mr. Lea's colour screens were not so far above suspicion as he would suppose, and perhaps it would be found on trial at least as difficult to "decide positively" on the presence or absence of foreign light in the case of coloured glass as with the spectrum.

The Metric System.—A Bill was brought into the House one day last week, to legalise the use of weights and measures of the metric system in this country. This subject has been much talked about for many years past, but little has been done in the matter, and it remains to be seen what will be done now. As we have said on previous occasions, the metric system would be very convenient to photographers, because all Continental photographic formulæ are given in grammes and cubic centimetres, and they sometimes suffer on conversion into English grains and fluid drachms.

Royal Society Soirée.—At the Royal Society *Soirée*, on Wednesday last week, photography was very conspicuous, especially as applied to astronomy. From the Astronomer Royal there were photographs of the moon, taken with the new Thompson twenty-six-inch telescope in the Observatory at Greenwich. One of them was obtained with an enlarging lens at secondary focus, being equivalent to a focal length of over a hundred feet. There were also some micro-photographs of metals and alloys, some showing the presence of carbon in steel in the form of very small diamonds.

A Picture Thief Caught.—Several pictures have of late been stolen from picture galleries on the Continent, the plan generally being to cut the pictures out of their frames, and quickly substitute an oleograph of about the same size and of a similar subject, so that the theft is not noticed at once, as would be the case with an empty frame. One day last week a man, stated to be a doctor of medicine, was arrested in Vienna, and on him were found the appliances for cutting pictures out of their frames and replacing them by others. He has confessed to the theft of two pictures from one collection, but denies that he had anything to do with the cases at Hamburg, Buda-Pesth, Vienna, and elsewhere. Now that this ingenious method of picture-stealing has become so generally known, the authorities of our national collections need be on the alert, as the same thing may be attempted here.

Preserving our Pictures, &c.—It is stated that to-day Earl Stanhope, in the House of Lords, will move an address to the Queen, praying that she will take such steps as may be required to preserve, in this country, such pictures, prints, books, MSS., works of art, and scientific collections, not yielding income, as may be of national, scientific, or historical interest. It would certainly be desirable to prevent so many art treasures and things of historical interest leaving the country, but it is a little difficult to see how it is to be avoided, and it will be interesting to know how Earl Stanhope proposes to do so. Every one has the right to do as he likes with his own property, and, if he sell it to any one else, whether Englishman or foreigner, the purchaser has the right to do the same—take it abroad or not, as he chooses. It is a well-known fact that wealthy Americans have been buying up, both in this country and on the Continent, at a high price, works of art to take to their own country, and, as we have said before, it will be interesting to see how it is proposed to prevent them doing so.

The True Cause of the Paris Disaster.—There have been many conflicting reports as to the origin of the terrible fire at the Charity Bazaar at Paris. The real cause has, however, now been ascertained beyond question by the confessions of the man who occasioned it. The light of the cinematograph, it appears, was the limelight with an ether saturator. This became exhausted, and had to be recharged, and, while pouring in the ether, the place being dark, the operator asked for a light. The assistant then struck a match, and the vapour of the ether, as might have been expected, took fire, and set fire to the celluloid films, which flared up, and in a few seconds all the draperies were in a blaze. Both the operator and his assistant are to be prosecuted on a charge of homicide through imprudence.

We fear that there are some in our own country who use ether saturators who may some day meet with a similar accident through being ignorant of the properties of the material they are dealing with. It is not every one who uses a saturator that is aware of the properties of sulphuric ether and the high inflammability of its vapour. Not only is it highly inflammable, but, when it is mixed with a certain proportion of air, it is as explosive as coal gas when mixed with air. Although ether itself is very light, its vapour is very heavy, and may be poured from one vessel to another. When ether has to be decanted by artificial light, it should always be done below the flame, and never above it. Accidents have happened through its being supposed that, as the ether is so light, its vapour is light also, and on that supposition the operation has been conducted above the flame with serious results more than once.

By the way, it is said that the French insurance companies repudiate the claims arising out of the lamentable catastrophe on the ground that the cinematograph should not have been there. We, in this country, have not heard that the exhibition of the cinematograph is an element of danger, or is liable to vitiate our policies of insurance, nor, we opine, are we likely to do so.

JOTTINGS.

The timber trade must be in a flourishing state just now. A walk along the route that will be taken by the Queen's procession on June 22 reveals the fact that nearly every public building and prominent site is being rapidly covered by huge wooden erections designed to accommodate tens of thousands of loyal sightseers on the eventful day. Many of the architectural beauties of London are, for the time being, undergoing severe disfigurement, and it is to be hoped that, during the next week or two at all events, there will be no commissions abroad that need urgent execution for views of the principal parts of the West End and the City, otherwise the results can hardly fail to lack the essential features that are permanently required, whatever they may temporarily gain by the intrusion in the photographs of the elegant specimens of the carpenter's art for which the Diamond Jubilee celebration is responsible.

Fine weather alone is needed to make the day and its observance a complete success. Much is expected from photography as the splendid *cortège* takes its way through the miles of crowded streets, and, from the enormous number of cameras that will surely be pointed at the procession, it is safe to expect a plentiful supply of good results. It is interesting to recall the circumstance, that in the Jubilee procession of 1887, from Buckingham Palace to Westminster Abbey, photography did not play what we should now consider a particularly prominent part. But there were very few hand cameras about in those days; animated photography was non-existent, and the illustrated press had not yet learned to fully appreciate the value of photographs as illustrations and the half-tone process for reproducing them. The great strides made by photography in those ten years cannot be better gauged than by contrasting the extent to which it will be called into use during the Diamond Jubilee as compared with the celebration of 1887.

Messrs. Anthony, of New York, who have taken up the Chassagne–Dansac process commercially, are to be complimented on their enterprise. It is announced that materials for working the process will be available on July 1, and amongst those materials there is mentioned, by one of the several American journalists who have written in enthusiastic terms of the process, "a specially prepared plate, which will cost slightly more than the regular ones." It has already been pointed out that, in Messrs. Dansac & Chassagne's description of their method, there is no reference to a specially prepared plate. Like the origin of Jeames de la Pluche, the Dansac-Chassagne colour process appears to be "wrapped in mystery." Yet our American photographic brethren seem to have become quite excited over it, and to have started booming it in the most fervent manner. Possibly there is money in the process, but I venture to think that, ere long, the precipitancy with which it has been hailed by several writers

as the solution to the problem of photography in natural colours will cause those gentlemen no inconsiderable chagrin. The mere staining of prints and transparencies satisfies no serious theory of the photographic reproduction of objects in the colours of nature, while practically, as regards the finished results, the Dansac-Chassagne process is open to very serious criticism; but our American friends have lost their heads over it, and cannot therefore be expected to be able to criticise the results—yet.

Mr. Harold Baker, one of the most accomplished photographers that we have, gave a capital talk on portraiture the other night at the Royal Photographic Society, and, in the course of some incidental references, supported me in my suggestion of a month ago, that the paying public preferred the "usual thing" in photographic portraiture, and would take no other. Mr. Baker, whose artistic instincts are undoubted, tells us that he finds his sitters do not want the unusual, or "artistic," thing, and courageously lets us know that he is too good a man of business to refuse to satisfy a demand. I draw attention to Mr. Baker's remarks, a report of which will be found on page 318, as, by reason of their strong common sense, they should carry a breath of comfort to the professional photographer, who, if he happen now and then to be beguiled into reading the utterances on Art by certain photographic writers, is sorely puzzled to make up his mind whether he is or is not guilty of a serious crime in conducting his business on lines that pay best, and leaving High Art to those who can afford to indulge in that luxury. Yet, for all that, cannot the "usual thing" be made beautiful and æsthetic? Mr. Baker's own work is strong evidence that it can.

Mention of the word Art reminds me that the recent election of Judges for the forthcoming R.P.S. Exhibition affords me my annual opportunity of protesting against the choice of painters to sit in judgment on the productions of photographers. Were I an exhibitor, I should very decidedly object to having my work adjudicated upon by gentlemen, no matter how eminent they might be in other respects, whose knowledge of photography and photographic possibilities and limitations I had entirely to assume. Surely it is time to recognise the undoubted truth that photography as an "art"—I use the word for the sake of convenience—stands quite by itself, and apart from other methods of graphic representation, to be judged and criticised by its own special standards, and not by those of painters, who probably for 364 days out of the 365 have no concern or interest whatever in the productions of the camera?

Matters in connexion with next year's International Technical and Trade Exhibition at the Crystal Palace move slowly, but it is satisfactory to note that the trade have passed a resolution in favour of holding the Exhibition. This, at any rate, is something done. I have heard many opinions in favour of the scheme, and very few indeed against it. There appears to have been some slight fear expressed by one or two gentlemen, who have not concerned themselves in the preliminary discussions on the subject that have been going on for nearly a year, that the trade would not be adequately represented on the Executive Committee. This is an erroneous idea. It has all along been the wish of those who have been endeavouring to bring about the holding of the Exhibition that, as far as possible, its management should be in the hands of those in whose interests it is being organized, viz., the trade and the profession. It only needs that all concerned should pull together in support of the Exhibition for the display next April to be a really great exposition of the present state of modern photography in all its branches and aspects.

Animated photography has achieved the crowning glory of pavement popularity. In the City of London you can buy a little book, the leaves of which bear photographic reproductions of a dancing girl, and like subjects. When the leaves of the book are passed rapidly under the thumb, the movement of the dancer or other figure is, of course, shown. The "invention" of this development of animated photography is attributed to Colonel Gouraud, Mr. Edison's partner; but surely there is nothing so clever as to deserve the title "invention" in taking a strip of zoetropic figures, cutting them up, and getting the phenomena of movement by means of the thumb instead of revolving the uncut strip behind an aperture? COSMOS.

AMERICAN NOTES AND NEWS.

The Use of Formalin.—The *Photographic Times* has a note on this subject, in the course of which it states that, "according to *The National Druggist*, Schroeder detailed before the recent general assembly of the Netherlands Apothecary Association a cheap and ready method of preparing formal gelatine without the use of any special apparatus, which we condense as follows: Dissolve any amount of gelatine in an equal amount of water by the aid of heat. Strain while still hot, and to every 100 parts of the warm solution add two parts of formalin, stirring thoroughly in. The mass soon attaches itself to the stirring rod in a thick, tenacious ball, which is then transferred to a cold capsule, and placed in a vessel provided with a tight cover. Formalin is poured over it, the cover closed fast, and the whole allowed to stand a while. The formalin used for the latter purpose can be used over and over again. After standing, the gelatine is removed and rubbed down to a coarse powder. The latter is thoroughly washed with water, dried, and can now be reduced to the finest powder, which can be used for all the many purposes for which formalin gelatine has of late been found useful. It is essential that the processes here described shall be followed closely, as otherwise difficulties are apt to arise."

American Apparatus.—A Californian photographer thus writes to the editor of an American contemporary: "Why don't you turn your attention for a little bit to the question of apparatus? There is no profession on earth obliged to use such stuff as portrait photographers. We have fine lenses; but look at the camera and our other accessories, and observe how crude and clumsy they are. Cannot you start a crusade that will induce manufacturers to see if they cannot introduce something artistic in design?" This letter comes upon us as a surprise, as we were under the impression that American manufacturers were not open to the charge of producing inferior and inartistic apparatus. It is a matter for congratulation that English manufacturers do not provoke criticism in these respects.

Photographers' Diplomas.—"Torita," in the *St Louis and Canadian Photographer*, expresses a low opinion of the value of diplomas to photographers. "A diploma in a physician's office," he says, "may be a licence to kill, but it certainly does not guarantee a correct diagnosis of every patient's case; it is his reputation, achieved by skilful work, that brings him patronage. A photographic diploma, no matter how handsomely framed and hung in the reception room of a studio, will draw more flies than customers. *Work*, and of the best quality, is what is needed to attract a fair share of trade in photography. I know at least forty men practising in studios who are good all-round workmen—doing really first-class work—who could never get a diploma by passing a technical examination; not a few of these could teach some of the 'leaders.' Many do *all* their own work—from the reception room to the finished print. *They are good practical workmen* without diplomas, and their patrons are numerous. Will any patron, think ye, demand to see this piece of paper, with the official stamp on, before granting a sitting? The best diploma any photographer can have is his work." Granting all this, we yet have noticed that in this country the fellowship certificate of the Royal Photographic Society is highly prized by many professional photographers.

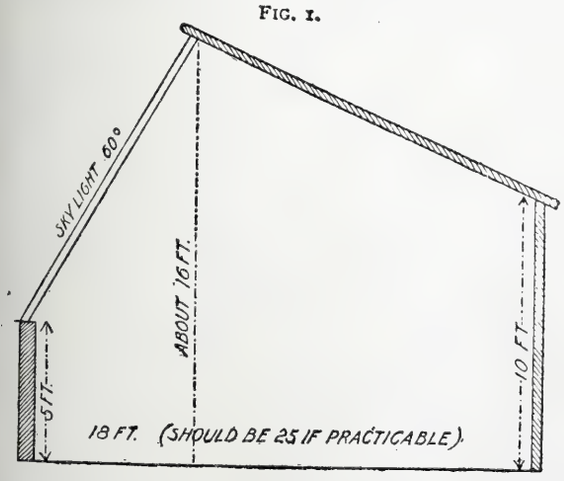
Individuality in Backgrounds.—It is with backgrounds as with lighting; let some one start a craze, and it is wonderful how every one follows. Because some one thing is a success in one man's hands, says Mr. G. H. Croughton in the *St. Louis and Canadian Photographer*, it is not to be supposed that it is the *only* way to do. Why cannot photographers show their individuality instead of being mere imitators? That there are a few who do is certain, but they are very few indeed, and they have obtained such a position that the generality of photographers think they can succeed by imitating them instead of cutting out a path for themselves. I willingly grant that the background of to-day is a great improvement on the past. There are artists painting backgrounds, and, if the photographer had more art knowledge, there would be still less of the inartistic grounds than there are; but, as one prominent background painter told me when I

as expressing my approval of a certain ground as my ideal of an tistic background, very few photographers have the knowledge and ste to accept a background on its merits as a *background only.* id he: "I quite agree with you that particular ground is my best ckground, studied as a support to the figure, but it is a *bad seller.* can sell six of this (turning to a ground that had all indoors painted it) to one of the other, and we background painters have to work r the dollars as well as other people." Now, as I said to the sembled photographers at Milwaukee, cultivate the faculty of servation and study people in their own parlours, and everywhere se; see how little of an ordinary room could be gotten into the mpass of an ordinary cabinet picture behind your friend as you sit atting to him, and you will soon become convinced that a very w backgrounds indeed show *little* enough. Notice how the figure pears gigantic in comparison with the perspective of the room or ndscape painted on your background, and you will then see how uch too much the ordinary photographic background contains.

The American Convention.—Our American contemporaries e very thorough in their support of the American Convention. All od men and true, writes the *Professional Photographer* in an outrst of enthusiasm, should be hard at work on their Convention hibit now. The '97 P. A. of A. Convention is going to be the eatest, grandest photographic Convention ever held. There is not photographer in the land who can afford to miss it. Make it finitely known through your establishment and around town too, you can, that you are going to the Convention to get the moss bbed off, and to get new ideas *for the benefit* of your patrons, and b the fact well in, that they as well as you are to benefit by your ing. If necessary, lock the door when the time comes, and advertise that you have gone to the Convention. Advertise a week ahead at you are going—and then go. You will get plenty of new ideas Chatauqua to show for your absence, and to do business with for e balance of the year. This is the spirit in which the British Conntion should be supported.

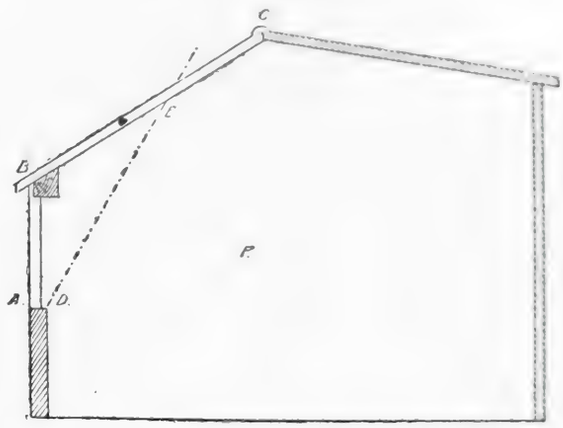
The Single-slant Light.—On this subject Mr. G. G. ockwood has the following note in *Wilson:* "Recently the singleant form of skylight has been introduced and discussed as if it was new thing in the art—in fact a new principle in portrait lighting. he idea is, however, not novel, nor the desirability untried or of ubtful result. Does the average photographer realise that he now es what is practically the single-slant skylight; or, in other words at the effects he seeks are precisely the effects which he would cure did he possess such a light? A large majority of the existing ylights are known as 'hip' skylights, that is, they are built in two ctions, usually joining, say seven or eight feet from the floor. The ser will start, say, three feet from the floor, extend five feet in a

FIG. 1.



early or quite perpendicular direction, and there join another sash r frame, which will rise in pitch from thirty to seventy degrees. Where they join there is usually a large obstruction, in the way of beam or trap for supporting the two sashes (see fig. 2). Now, what is the first thing one does under this form of light in illuminating the sitter? We pull down the curtain from C half way or more) the distance to B; likewise from A a like distance from A oward B. The extent of light ordinarily used extends from D to E. The sitter is supposed to be at F. Now, if the obstruction was removed from the junction of the two sashes at B, would not the change be very desirable, and would it not be equivalent to the single-slant light represented in fig. 1, and of which we use practically the same amount and direction of light as indicated by the dotted line in fig. 2? After forty years' experience under the skylight, fig. 1 is the form which I have adopted for my son's new establish-

FIG. 2.



ment, where we were unrestricted, except in the width of the room, and could build any kind of a light which experience suggested. Hence, we have repeated the form in use for many years at my old establishment on Broadway and Fifteenth Street, which for general utility I never saw surpassed. Such a form needs but little change in the shades or curtains, during the hours of sittings, when the exposure of the skylight is due north. As an incidental matter, I may say that I use ground glass as a personal preference. Many will not agree with me in this, as the difference in quickness is positively in favour of the new white 'hammered glass.' This matter of speed can be easily tested by exposing some sensitive paper under a piece of each sort of glass in a very weak light for a few seconds. It will be seen that the clear or 'hammered glass' will print a much darker tint than the ground glass. Notwithstanding this, I prefer the soft transparent shadows given by ground glass, and a couple of seconds' exposure is not an eternity, even in this impatient age."

Frightened by the Camera.—The Editor of the *Photo-American* tells an interesting story illustrative of the power of the camera to quell a riot:—"The cartmen of the Barber Asphalt Company struck and attempted to prevent others taking their places, threatening violence. The Company readily filled their places with new men, and, anticipating a disturbance when the carts started out, resolved to obtain evidence against individuals participating in the riot by means of photography. As the first waggon, driven by a new man, rounded the corner, it was charged upon by a howling mob of enraged strikers. The waggon was escorted by thirty policemen and six men with hand cameras. When the mob rushed up to begin the attack, the six cameras were pointed at them, and shutters began to click right merrily, every click probably furnishing evidence that would mean a trip to Blackwell's Island or Duetville to half a dozen of them. The effect was electric; the strikers, who would not have hesitated a moment in the face of the squad of police, stopped suddenly, and covering their faces by putting up their hands, tugging caps down over their eyes and turning up coat collars, cried, 'They are taking our pictures,' and retreated hastily. In a short time the street was clear, and, by keeping a man with a camera at all the jobs, the work proceeded peaceably and without the necessity of force. The use of cameras is a regular thing with the Company, to show the progress of work and as a record of it, but this was the first time they ever used their camera squad to quell a riot."

TRI-AMIDOPHENOL AS A DEVELOPER.

[Translated from the Revue de Physique et de Chemie by G. E. Brown, A.I.C.]

ALKALINE developers, when used for developing plates that have been considerably under-exposed, are liable to give an appreciable amount of fog, particularly if the development is pushed very far with a view to securing detail. The fogging may be ascribed to the excessive amount of free alkali usually added during such development. Hence the desirability of a developer which can be used without addition of free alkali. The author has found a developer of di-amidophenol to give good results, and has tried to obtain a still greater effect by increasing the

number of amidogen (NH_2) groups. He has therefore experimented with tri-amidophenol, $C_6H_2(OH)NH_2NH_2NH_2$ (1) (2) (4) (6), obtained by reduction of picric acid.

While describing the preparation and properties of this compound, some remarks may be appropriately added on the employment of monosodic phosphate and of neutral sulphite of soda—substances which are becoming more and more generally used in photography.

Preparation of tri-amidophenol:—Picric acid is treated with tin and hydrochloric acid in presence of water. A process of reduction is thus carried out, the nitro groups of the picric acid being converted into amidogen groups.

The liquid is decolourised, concentrated, and the double salt of tin and tri-amidophenol allowed to crystallise out. The crystals are strained off, dissolved in a little water, and the tin precipitated by sulphuretted hydrogen. The filtered liquid is evaporated considerably on the water bath, and, after cooling, strong hydrochloric acid added. Hydrochloride of tri-amidophenol is insoluble in strong hydrochloric acid, and is therefore deposited in fine white needles. This crystalline deposit is strained off, spread out till completely dry, and placed in bottles. Tri-amidophenol keeps well in a dry state in the form of hydrochloride. Dissolved in water, it soon suffers deterioration when exposed to air, a tendency that is still more marked in the case of the free base. Hence it is best to keep it in acid solution.

Employment of monosodic phosphate:—This salt ($NaH_2PO_4H_2O$) should be acid to turmeric and neutral to Poirrier's orange (No. 3); *i.e.* should contain only free H_3PO_4. It occurs in commerce, and is easy to prepare.

Employment of crystallised sulphite of soda:—This salt should be quite neutral (*i.e.*, should contain no alkaline carbonate) or, at any rate, should not contain more than one per cent. Chemically pure neutral sulphite in concentrated solution colours phenolphthalein solution pink, but the colouration disappears on adding a single drop of dilute acid.

To test a sample of sulphite suspected to contain carbonate, dissolve five grammes in about twenty-five cubic centimetres of water, and boil for about fifteen minutes with excess of sulphur. During this operation the sulphite is entirely converted into thiosulphate, whilst the carbonate present becomes converted into polysulphide. After cooling the liquid, add excess of ammonia and a little silver nitrate. If the sulphite is free from carbonate, there is no colouration; if it contains less than one per cent. of carbonate, a feeble colour is produced; but, if the proportion of carbonate rises to as much as five per cent., an intense brownish colour is produced together with a precipitate of silver sulphide. By making comparative tests it is possible to approximately estimate, without any pretence to great accuracy, the quantity of carbonate present. The estimation of the carbonate by titrating the original sample against standard acid and phenolphthalein does not give even approximate results.

A good formula for compounding the developer is as follows:—

Soda sulphite (crystallised)	50 grammes.
Monosodic phosphate (dry)	30 ,,
Tri-amidophenol hydrochloride	5 ,,
Water	1000 c. c.

Dissolve the sulphite first in a portion of the water; then add the phosphate; make up to 1000 c.c. and add the tri-amidophenol.

The developer is slightly acid to turmeric paper but does not give off any odour of sulphurous acid. Theoretically, the phosphate transforms the neutral sulphite into bisulphite, itself passing to the state of common disodic phosphate, which has the effect of rendering the image more vigorous. The bisulphite formed prevents too rapid deterioration of the developer and increases the developing properties of the tri-amidophenol.

The developer, prepared as above, possesses the following advantages: It develops under-exposed plates with detail, and without too harsh contrasts; it does not fog and does not choke up the high lights. Development is rapid and plates do not frill.

G. Rollin.

HÜBL'S COLLODION EMULSION.

As an addendum to the articles on three-colour work in recent numbers of the Journal, it may be useful to give the methods recommended by Hübl for making the two kinds of collodion emulsion he prefers.

Hübl first lays stress upon the viscosity of the collodion, for upon this depends, to a great extent, the obtention of a fine-grained emulsion. In order to test the viscosity, he uses a tube of glass 15 cm. long. and 3 cm. internal measurement, one end of which is drawn out to a fine aperture of about 1 mm. internal measurement. Close to the wide end is scratched a line, to which it should be filled each time. This tube is first filled with water by closing the small aperture with the finger. The temperature of the liquids to be tested should be between 16° and 22° C. Having filled the tube with water, the time taken for the water to flow out of it is taken as the basis of the calculation and then the time taken by the collodion to run out is noted, and the latter divided by the former gives the viscosity of the collodion. For instance, Hübl states that water took, in the experiment, 85 seconds to run out, whilst a four per cent. celloidine collodion took 135 seconds so that $135 \div 85 = 1{\cdot}59$, the viscosity of the collodion.

For making the emulsion, Hübl recommends a four or five per cent collodion, with a viscosity of 1·55 to 1·65.

The two methods which he recommends are: (1) an ammonio-nitrate method, and (2) a chloro-bromide emulsion. The former is made as follows: Dissolve 50 grammes of silver nitrate in 50 c. c. of distilled water, and add sufficient ammonia to redissolve the precipitate first formed, and, when a perfectly clear solution is obtained, add 25 c. c. of absolute alcohol. A second solution is prepared of 32 grammes of ammonium bromide in 35 c. c. of water and 50 c. c. of alcohol, and solution effected by heating it.

To make the emulsion, a bottle holding 1½ litres should be prepared, and into this 600 c. c. of the above-mentioned four per cent. collodion should be placed, and the silver solution added to it in the dark room. Part of the wool will separate, but redissolves on vigorous shaking, and some of the silver may crystallise out, but this can be neglected. To this silver collodion is added very gradually in small quantities at a time, and the whole well shaken after each addition, and, when all has been added, the emulsion should be shaken for two or three minutes and then precipitated with water. In order to do this, about one-fourth of its volume of distilled water should be added gradually to the emulsion, with constant stirring, and then the whole should be poured into five to ten times the quantity of water, a smooth glass rod being used to stir it all the time. The mixture should be allowed to settle, the clear supernatant liquid carefully decanted, and the vessel filled up three or four times with water, the precipitated emulsion being well stirred up in each water. It should then be collected on a piece of clean linen, well drained and pressed, to free it from as much water as possible, and then it should be put into some alcohol, well stirred and again pressed, this last operation being repeated, and then the emulsion strongly pressed, so as to drive out all liquid.

When this has been done, it should be covered with 250 c. c. of absolute alcohol, and allowed to stand for twenty-four hours, at the end of which time 150 c. c. of the liquid should be poured away, and 150 c. c. of absolute alcohol, in which 0·5 grammes of narcotine has been dissolved, and 250 c. c. of ether should be added. This should be allowed to stand for three days, then filtered and diluted with 500 c. c. of alcohol and ether.

The second process of making the emulsion is with excess of silver nitrate, in the presence of aqua regia. Hübl recommends the use of bromide and chloride of zinc, and points out that, as the commercial salts are generally damp, and will not keep dry, it is advisable to dissolve them in sufficient absolute alcohol to make a 1 : 4 stock solution. He suggests testing the actual quantity of bromide and chloride in the solution as follows:* 5 c. c. of the solution of chloride or bromide should be diluted with 200 c. c. of distilled water, and a few drops of a solution of neutral chromate of potash should be added; 5 grammes of silver nitrate should be dissolved in 100 c. c. of distilled water, and this should be placed in a burette, and sufficient solution allowed to drop into the chloride or bromide solution till, after stirring, the solution shows just a faint rose colour, due to the formation of chromate of silver; the strength of the solution is then calculated out in the usual way.

To prepare the emulsion, 50 grammes of silver nitrate are dissolved, with the aid of heat, in 50 c. c. of distilled water, and 100 c. c. of alcohol and 10 drops of nitric acid added, and the solution added to 500 c. c. of four per cent. collodion, and the mixture shaken till the precipitated pyroxyline is redissolved, and then in the dark room sufficient bromide of zinc solution added to combine with about 42 grammes of the silver. Then to the emulsion is added 3 c. c. of aqua regia, made by heating equal parts of nitric and hydrochloric acids. The emulsion should be well shaken and allowed to stand till, when looked through, it has a greyish-violet colour, which will take from twenty-four to thirty-six hours. After this time the free silver is converted into chloride by taking as much of the chloride of zinc solution as will decompose 8 grammes of silver nitrate,

* Hübl assumes that all commercial bromides and chlorides of zinc are damp, but perfectly dry samples can be obtained and dissolved at once without testing.

and it should be mixed with an equal quantity of four per cent. collodion, and added to the emulsion. The emulsion should be tested with a little potassium chromate, to see that there is no free silver nitrate, and it may then be precipitated, washed, pressed, treated with alcohol, and, whilst still damp, dissolved in 1000 c.c. of alcohol ether.

AMSTUTZ'S METHOD OF AND APPARATUS FOR REPRODUCING PHOTOGRAPHS, SKETCHES, AND THE LIKE.

The invention of Mr. N. S. Amstutz, of Cleveland, Ohio, relates to the art of reproducing photographs, sketches, and the like, for printing or other purposes, and it consists in first forming the subject to be reproduced with an uneven surface, and then causing a graver or cutter to automatically interpret the subject upon another surface that is superimposed upon the surface of the said subject, as hereinafter explained, the depths of the cuts varying in accordance with the lights and shades of the acting surface.

"In carrying out the said invention, I prefer to employ a device," says Mr. Amstutz, "such as that illustrated in the accompanying drawings, wherein the subject and the superimposed meterial upon which the subject is to be reproduced are rotated or otherwise moved contiguous to a cutter having a cross feed, but it will be apparent that the cutter may be stationary and the subject be fed horizontally.

"Fig. 1 is a cross section of a greatly enlarged portion of a relief surface and recording material, with a cutter and support in diagrammatic relation thereto.

"Fig. 2 is a cross section of a simple form of mechanism embodying the features of my invention.

"The mechanism shown in fig. 2 comprises a bed or base frame, 6,

Fig. 1.

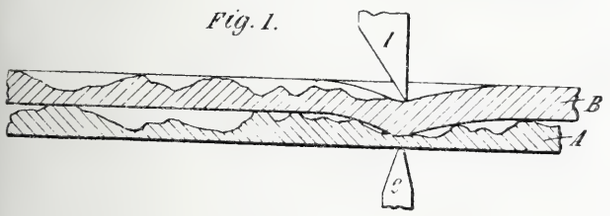
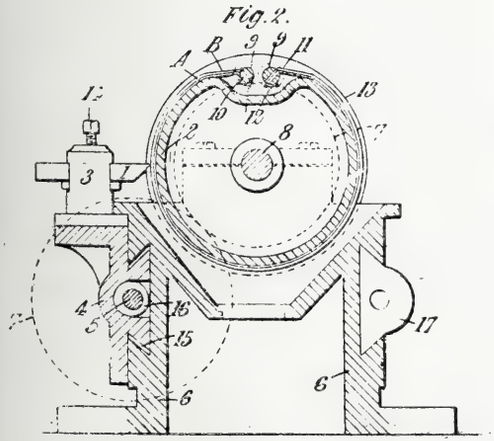


Fig. 2.



having guideways, 15, formed for the support of the slide rest, 4, which is moved in the guideways by the feed screw, 5, acting through the nut, 16, projecting from the slide rest.

"The feed screw is supported by bosses, 17, and at one end a change gear, 7, meshes with a similar gear upon the drum shaft, 8. The slide rest, 4, carries the tool-holder, 3, which holds the recording tool, 1, through the set screw, 14.

"The relief surface and recording material are held superimposed as follows:—The drum, 2, is furnished with a pair of slotted shafts, 9, which have pinions, 12, secured thereon. These pinions mesh with each other, and when the sheets, A B, are placed in the slots, 11, and one of the shafts, 9, is turned by a key placed upon the square end, 10, the said sheets are drawn tightly against each other. A suitable pawl engages one of the pinions, 12, and serves to lock them in position. The shafts, 9, are held in heads of the drum or cylinder, 2, which has about the same diameter in the drawings as the driver, 13.

"The change gears, 7, can be replaced by others, so that any number of lines per inch can be used, depending upon the ratio of the change gears to each other and to the feed screw.

"In practising my method I first produce a photo-gelatine sketch, or other relief surface, of the subject which is to be reproduced by any of the processes adapted to produce the same, such relief surface being a positive or negative, according to the kind of the reproduction desired.

"The relief subject thus produced, which is indicated in the drawings by the letter A, is mounted upon the rotatable roller or drum support, 2, and a reproducing sheet of yielding material, B, such as gelatine, celluloid, soft metals, or the like, is placed directly against the relief subject. The recording material is made preferably of a sheet or other yielding form, so as to be secured against the relief surface in an easy manner. The cutter, 1, is set with its points at a predetermined distance from the relief-surface support, 2, a distance about the thickness of the film, more or less, upon which the subject is to be reproduced, and, as the drum, 2, is rotated, the reproducing material will be caused to move under the cutter, 1, in a to-and-fro direction, according to the unevenness of the relief surface, A. In this way the cutter, 1, records cuts of varying depth in the reproducing material, B, and automatically executes an engraving from the relief surface, which may be used for surface or "steel-plate" printing or embossing, as desired, according to whether the cutter has a pointed or blunt end. It is understood that an intaglio-surfaced subject comes within the scope and general meaning of "relief surface," because one is simply a counterpart of the other, and an uneven surface of any kind is intended to be included under the general term "relief surface," whether the unevenness varies between maximum and minimum points or not.

"Should a blunted cutter be used, and the cuts occur near enough to each other to overlap, then a duplicate relief surface is produced, which is serviceable for embossing, die-printing, and the like. It is immaterial, however, whether the gravers, scorers, or cutters, are of the chisel or rotary form, or of any other type, so long as the record which is made by the tool is an indication of the design or subject reproduced, whether the same shall be used for one purpose or another. A rotary cutter would be preferable for engraving on thin sheets of steel or other materials other than celluloid or gelatine, the essential points to be attained being to cause the cutter to penetrate the material upon which the reproduction is to be made a greater or less depth, according to the variations in light and shade or surface of the subject to be reproduced, and transposing the relief variations, when ink-printing surfaces are desired, into similar variations in lines at about right angles thereto, or, if the reproduction is to be simply another relief or intaglio, then the variations would be about on the same to-and-fro plane as the variations of the subject that is to be reproduced.

"With my method I am able to preserve a maximum amount of detail with the smallest number of lines per inch upon subjects having small detail, thus producing printing surfaces capable of being used for the most rapid press work upon daily papers and the like. This requisite detail cannot be attained by the well-known half-tone process heretofore used, because, if the 'mesh' of the cross lines is made coarse enough to produce the necessary depth in etching them, some parts—for instance, the eye, or mouth, or nose—of a small face would disappear entirely, no detail thereof being preserved at all, because the opening of the mesh may be larger than the detail to be reproduced. If, perchance, it should occur at the intersection of the lines of the mesh, then a very small indication might be obtained, but no dependence can be placed upon these small details occurring at the proper place. It is impossible, in my method, to skip any details with the coarsest lines, provided the angle of the cutter is properly disposed in relation to the depth of cutting and the number of lines per inch, more especially the relation between the angle and the number of lines per inch, since, with a greater number of lines, the relative depth of cutting must be increased, or must be greater in relation to the width of cut than in the wider cuts or coarser or smaller number of lines.

"In half-tone engraving, as ordinarily practised, the ratio of depth to the distance between centres of lines is almost a constant value, while the finer-lined subjects (more lines per inch) should have a greater depth, that is, the ratio between the depth and the distance between centres of lines is different from what it is in coarse line work, so that the fine-line reproductions will stand rapid press work, stereotyping, and the like. In order to clearly show what is meant, it is assumed that an ordinary half-tone, with eighty lines per inch, or ·0125 inch from centre to centre of lines has a maximum depth of etching of the grooves between lines of one-eighth the distance they are apart at their centres. In other words, the relation would be ·0125—·00156, while, with my system, I am able to procure effects which numerically bear the following relations to each other: ·0125—·005, the depth being ·005 inch, as against ·00156 inch. In practice, the relief surfaces used vary in maximum relief from ·002 inch to ·004 inch, and the reproducing material from ·005 inch to ·012 and ·015 inch thick. If the cutter is so arranged that the maximum relief causes the cutter to slightly overlap a contiguous cut, so as to bring the apex of the pyramidal ridge formed between them just even, or slightly below, the normal face of the reproducing material, then the maximum white or black effect is produced, according to the kind of surface which is used, whether a positive or negative. When the relief is a minimum, then the cutter ordinarily penetrates the reproducing material the least or not at all. Thus it will be seen that, no matter how small the detail (which may, within its small area, vary between a maximum white and black and still be lost with coarse half-tone lines), it will be indicated with my method, especially so with any plan of operation wherein the reproducing material is placed in the shape of a yielding film, sheet, or plate between the cutter and the relief subject, because the

small area of detail, even if it occurs between two contiguous paths of the cutting, will have a distinct effect upon the wall of the groove which occurs nearest to it, causing the material to be cut away more or less, as the case may be, independently of the other wall of the groove, thus making it possible for me to produce small faces of groups, for example, in coarse enough lines and relatively deep enough grooves for ordinary newspaper printing without sacrificing detail.

"For ordinary newspaper or other printing, if I desire to have a cross-line effect, I first form parallel grooves of V or other shape upon one side of the material upon which the reproduction is to be made. These grooves are made about at right angles to the path of subsequent travel, or I may so design the means for supporting the films as to make it possible to retain their 'register' and cut them at about right angles to each other directly from the relief surface.

"When the grooves are first cut into the reproducing material, the cutter, as it subsequently passes over the other or same side of the material, cuts uniformly across these grooves, regardless of the variation of the relief surface, thus producing a cross-line effect.

"If the grooves are on the under side of the reproducing material, then the cutting on the other side will be just a trifle shallower and narrower as the cutter passes over the groove, thus breaking up the recording cuts into periodic variations independent of the subject. When the grooves are formed on the face of the reproducing material, the ridges are broken up at right angles thereto, so that a 'stipple' effect is produced, in contradistinction to the suggestive cross lines when the grooves are on the under side. When a blunt cutter is employed, the reproduction contains delicate relief lines in conformity to the pattern on the under side. The useful effect of the grooves, as herein outlined, are made

Fig. 5.

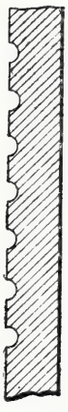


Fig. 3.

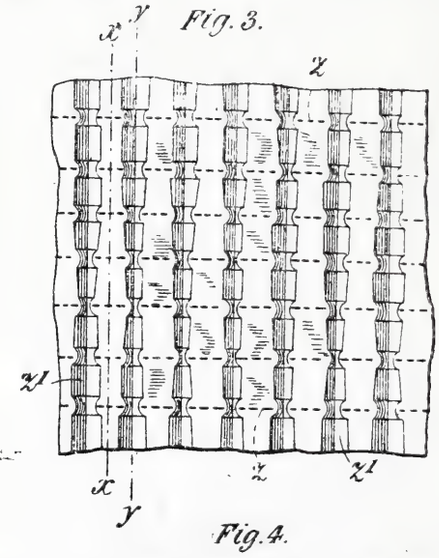
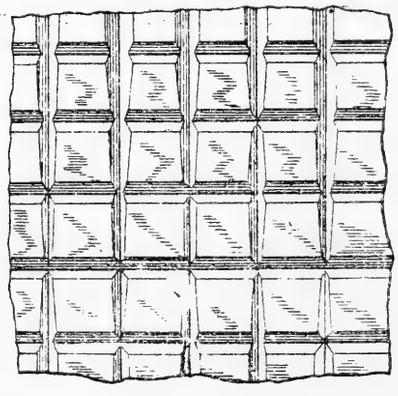


Fig. 6.



Fig. 4.



manifest by diagrams (figs. 3 and 4 of the drawings), fig. 3 being an enlarged suppositious diagrammatic view of cuttings when the reproducing material is patterned on the under side, and fig. 4 a similar view when the reproducing material is patterned on the recording face. Figs. 5 and 6 are cross sections on the lines x, x, and y, y, of fig. 3. z, z are uniform tint lines, and z^1, z^1 are varying recording cuts.

"My process is entirely automatic. The relief surface ean be used repeatedly, and the speed in actual practice is about ten square inches per one-tenth minute of time, thus making an engraving comprising twenty square inches in two minutes' time.

"One of the great advantages of my invention is the possibility of reengraving a subject within a few minutes, thus affording facility for correction; moreover, the engraving can be made in the locality where the photograph or sketch is taken or made.

"By changing the adjustments of depth of cutter or recording tool, which is not possible with a chemical etching process, the reproductions serve as ordinary printing plates. Stereotypes and electrotypes can be made from them directly, or the films may be mounted upon suitable supports and used for printing purposes without any other interventions. The reproductions, when a blunt cutter is used, may also be utilised as embossing printing plates and the like."

DEVELOPMENT IN CAMERA: TOWNSEND'S INVENTION.

This invention has reference to arrangements and combinations of the parts of photographic apparatus for taking, developing, and fixing photographic pictures, or for taking and storing undeveloped pictures without aid of a dark room.

Fig. 1 is the vertical plan of the apparatus, showing the lifting rod, I, in touch with sensitised plates.

Fig. 2 is the same plan as the fig. 1, with the rod, I, holding the sensitised plate opposite the lens.

Fig. 3 is the horizontal plan of the apparatus corresponding to the fig. 2.

Fig. 4 is the horizontal plan of the apparatus with the camera, A,

FIG. 1.

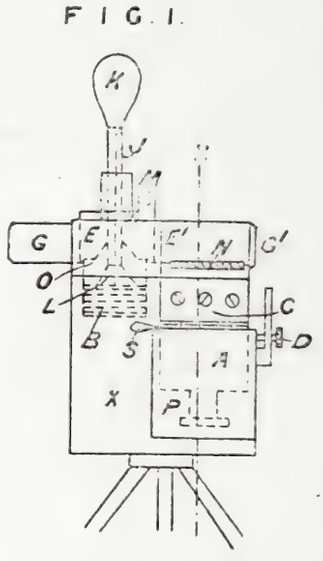


FIG. 2.

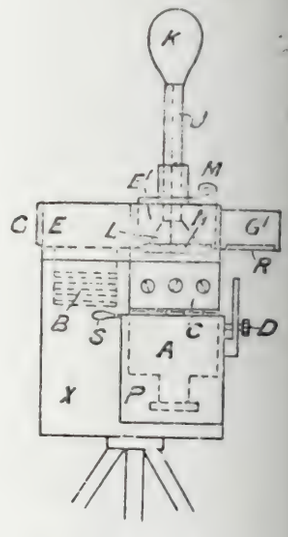


FIG. 3.

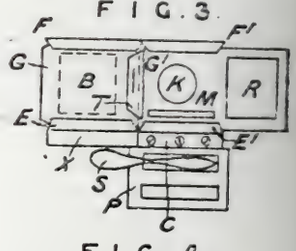


FIG. 5.

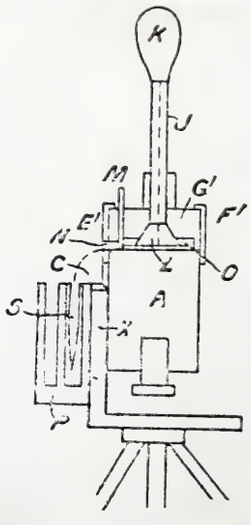
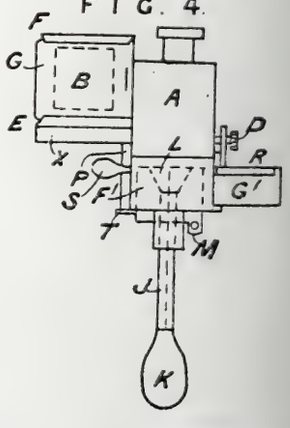


FIG. 4.



circled up into position for exposure, and in touch with the developing box.

Fig. 5 is the vertical section of fig. 2, showing the plate in the direction of the releasing slot.

The working of the apparatus is as follows:—

To the camera, A, provided with a lens and a suitable shutter, is adjoined a separate magazine, B, in such a manner as to have its top on the same level as the part of the camera, A, opposite lens. Both the

camera, A, and the magazine, B, are fixed side by side on the support, X, in following manner: the camera, A, on a hinge, C, for the purpose of swinging it to any desired angle, at which it can be stopped by a thumb screw, D, and the magazine, B, fixed firm to the support, X, open side upwards.

The camera, A, and the magazine, B, are provided with two sets of guides, E E^1, and F F^1 (each set being practically a continuation of the other), in metal or other suitable material, between which a carrying slide, G^1, in conjunction with another slide, G, of the same thickness as the slide, G^1, and forming a lid to the magazine, B, can be moved in two opposite directions without uncovering either the magazine, B, containing sensitised plates or the plate ready for exposure in the camera, A. These slides, G G^1, are connected between each other by means of the peg and loop, T, allowing the camera, A, of being detached from the magazine, B, and raised without disturbing the lid, G, of the magazine, B. The carrying slide, G^1, is provided on one side with a non-actinic focussing glass, R, and on the side nearer of the magazine, B, and at a suitable distance with a perpendicularly sliding rod, I, having an air hole through its length. The rod, I, has at its top end a pneumatic indiarubber bulb, K, and at its bottom end a suitable indiarubber sucker, L, fixed in such a way as to secure its perfect contact with the plate to be lifted. To carry the plates from the magazine, B, into the camera, A, the carrying slide, G^1, is pushed so as to bring the rod, I, above the magazine, B; the rod, I, is then sent down against the plates, the top bulb, K, pressed, and the plate intended for exposure is lifted by pneumatic action of the sucker, L, combined with the pull of the rod, I, into the recess, O, grooved in the corresponding part of the carrying slide, G^1, which brings it in the front of the lens, when restored to its former position; then the camera, A, is circled up to a required inclination for further operations. When in this position, the sensitised plate is maintained by a drawer-like slide, M, above the slot cut out in the carrying slide, G^1, for the purpose of its ultimate release. After the exposure of the plate, the camera, A, is brought in close contact with the reservoir, P, which is fixed against the support, X, in such a manner as to allow its aperture to meet the slot of the carrying slide, G^1. The reservoir, P, into which the exposed plate is allowed to drop by pulling the slide, M, is composed either of a suitable upright developing tank provided with a masked carrier, S, viz., a carrier in shape of a sheath, with a few holes at the bottom of it for the purpose of draining off the liquids, and which carrier protects the exposed plate from direct light, when transferred from one liquid to another, or it consists of a light-tight storage box.

FOREIGN NEWS AND NOTES.

An Automatic Developer.—Signor Novi suggests, in *Il Dilettante di Fotografia*, the following formula, which is said to produce good negatives, no matter what the exposure may have been, and independently of the character of the plate: Heat a pint of distilled water to boiling, and add to it 1¼ ounces of anhydrous sodium sulphite, and 48 grains of lithia, remove from the fire, and stir till all is dissolved, and add 10 drops of a saturated solution of potassium bromide; allow to cool, decant from any precipitate, and add 36 grains of hydroquinone and 24 grains of para-amido-phenol, and, when all is dissolved, pour into bottles, which shall be kept quite full. This developer may be used over and over again, and, as the old acts too slowly, from one-fifth to one-quarter of fresh developer may be added.

The Grain of Dry Plates.—Schumann has pointed out that the grain of the dry-plate negative does not always correspond with the grain of the emulsion, and that an addition of potassium bromide to the developer produces an enlargement of the grain, which is one of the causes why negatives developed with plenty of bromide are richer in contrast. Schumann assumes that some silver bromide is dissolved by the potassium bromide, and that it is then reduced by the developer, and is deposited on the metallic image, and thus increases the grain. Liesegang suggests that perhaps the increase of the grain is also dependent on the slowing of the developer, for he has pointed out that the grain increases in size with the duration of the development in strongly alkaline developers. Ostwald does not believe that the higher sensitiveness of a plate is dependent on the increase of the silver-bromide grain in the process of ripening, but that the silver enters into combination with the gelatine. That gelatine does act as a sensitiser can be easily shown in that silver bromide, without gelatine, will give no image.

Instantaneous Positives in Two Colours.—M. Gaby recently communicated to the Académie des Sciences the following method of obtaining instantaneous positives in two colours without the use of a negative. The idea of the process is based on the interferential method of Lippmann, but, instead of using a mirror in contact with the film, he endeavoured to incorporate the mirror in the film itself, each grain of silver bromide being in contact with its own mirror. Although, as M. Graby points out, the bromide would attack the silver, he hoped that interference would be produced, and give not only the colours by reflection, but also the complementary colours by transparency. An emulsion was made as follows: firstly, one gramme of silver reduced by ferrous sulphate, which gave an emulsion which, when wet, was reddish-orange; secondly, one grain of alkaline bromide; thirdly, one grain of sodium sulphite, or, better still, lead sulphite. With an emulsion formed of these three substances, instead of obtaining a negative with complementary colours by transparency, with two seconds' exposure in the camera a magnificent positive was obtained, which showed blue-violet in the shadows, yellow, or almost white in the high lights, and red in those parts less affected. Unfortunately this is a reversal of the colours, as the blue acted most strongly on the plate and was represented by yellow, the red did not act and was represented by red, as were also green, yellow, and black. When the amount of silver bromide was increased in proportion to the silver a negative was obtained of which the high lights were yellowish-red and the blacks greenish-blue. When mercury was used instead of silver, an ordinary black and white positive was obtained. Although this method is useless for giving photographs in colours, yet by its aid transparencies of great beauty of a blue-violet, red, and yellow colour at will may be obtained. It is curious that these positives, if the exposure was not too long, may be used as ordinary negatives for printing out, as the shadows which are blue allow the light to pass through, whilst the red-orange high lights do not. M. Graby states that he hopes by this method to suggest to some experimenter a method of research which shall end in the discovery of photography in colours without the use of a reflecting surface.

Stripping Plates.—Karasek suggests the following method for stripping gelatine negatives: Bathe the plate for ten minutes in a ten per cent. solution of formalin, dry, and heat gently, and coat with a solution of gelatine made of—

Water	1250 parts.
Gelatine	300 „
Glycerine	35 „

When dry, the negative should be bathed in a five per cent. solution of glycerine, and the damp film cut round with a sharp knife, and the film transferred to a sheet of glass which has been well cleaned with talc, and the edges bound down on to the glass with gummed paper, and, when dry, it may be coated with enamel collodion or negative varnish, and then stripped. Very old negatives cannot be stripped by this method, but require soaking in dilute hydrofluoric acid.

Iodine as an Accelerator.—M. Cousin revives the method, suggested some years ago by Valenta, of using iodine for accelerating development when hydroquinone is used. He proposes the following normal developer:—

Water	1 ounce.
Sodium sulphite (anhydrous)	20 grains.
Hydroquinone	5 „
Sat. sol. sodium carbonate	48 minims.
Ten per cent. potassium bromide	5 drops.

To this add five drops of the following iodine water:—

Water	1 ounce.
Potassium iodide	10 grains.
Iodine	2½ „

The negatives are a good black colour, and the developer acts very energetically.

Poisonous Properties of Uranium Salts.—Although Gmelin pointed out, in 1824, that the uranium salts are poisonous, it is generally assumed that they are harmless. Worochitzky has been experimenting, and found that the soluble salts of uranium are more poisonous than the salts of arsenic, and that 0·5 milligramme was sufficient to cause the death of an animal, although the death was slow. The principal action was hemorrhage of the heart and liver. For a man the fatal dose would probably be 0·05 gramme = ¾ grain. In the face of this statement, it is obvious that care must be exercised in using the ordinary uranium toning and intensification process.

Photography in Colours.—M. de Saint Florent, who has for so many years been experimenting on this subject, suggests the following method of obtaining direct prints in colours:—Celloidine paper is coated with a gum arabic solution, made by mixing nine parts of a saturated solution of gum arabic with one part of glycerine, and adding sufficient alcohol of 90° to form a sort of emulsion. When the coated paper is dry, expose under any coloured transparency to sunlight for an hour or an hour and a half, when a negative will be obtained which will show some colours. It is only necessary to expose this negative to light for a few seconds to obtain a positive with all the colours. To fix this image, a saturated solution of calcium chloride, to which have been added a few drops of hypo solution, should be applied to the back of the print. It is impossible to obtain images in the camera by this method, on account of the low sensitiveness of the silver chloride.

Our Editorial Table.

Vorlage—Blätter für Photographen.

Wilhelm Knapp, Halle a/S.

This work, by Dr. A. Miethe, will be published quarterly, and each number will comprise a series of pictures by photographers of the first rank, from which the operator may gather suggestions that may be of service in the improvement of his work. The first part contains sixteen Studies by Charles Scolik, of Vienna, the whole forming a collection of portraits printed in fancy designs. The pictures are printed in half-tone on surface paper, and are of excellent quality. It is proposed to issue series of portraits with specially designed backgrounds, groups of two persons, costume studies, three-quarter lengths, *genre* pictures, studies of children, &c. The professional photographer should find some valuable suggestions in this work, and we wish author and publisher success in their undertaking.

Tylar's Dry-plate Indurator.

W. Tylar, 41, High-street, Aston, Birmingham.

This is a solution for applying to gelatine negatives for the purpose of rendering the surfaces hard and impervious to damp and moisture. In virtue of this property, it is said to act somewhat as a retouching medium, and to do away with the necessity therefor. In use, after the negative has been fixed and well washed, it is given an immersion of about ten minutes in the Indurator, and the plate is then given a short washing. The solution may be used repeatedly. We have subjected the action of the Indurator to practical trial, and find that it renders the gelatine exceedingly hard—hard enough, in fact, for all practical purposes.

Trapp's Photographic Papers.

L. Trapp & Co., 1, Budge-row, E.C.

The prices of Messrs. Trapp's albumenised, gelatino-chloride, and collodio-chloride papers have not, they inform us, been raised, notwithstanding rumours to the contrary. Of the two latter kinds of printing surface, they forward us samples of their manufacture; and these, upon trial, reveal most excellent qualities. Messrs. Trapp have long been noted for the admirable suitability of their printing papers to photographic purposes.

"Along the Medway."

By Walker Miles. Published by R. E. Taylor & Son, 19, Old-street, E.C.

This is one of the author's well-known series of Field-path Rambles, taking the reader from Groombridge to Tonbridge, and giving pedestrian routes round Southborough, Bidborough, Edenbridge, Westerham, Sevenoaks Weald, and Tunbridge Wells. Photographers as well as pedestrians should find these carefully compiled little guide-books of great utility in their rambles with the camera.

Caramel Crystal Powder.

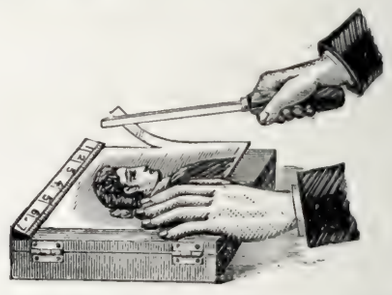
Manufactured by Lichtenstein & Co., Silvertown, E.

This is a pure dry caramel, of which Messrs. Lichtenstein have been good enough to send us a quantity for use. Mr. T. D. Lichtenstein informs us that caramel for the purpose should be obtained only from a good maker. It should be all caramel and not partly unconverted sugary matter which never dries. "As a matter of pratical experience I may say that returned empties arrive at the factory messed all over, but quite dry, although they may have been days and nights on the way in open trucks. There seems to be, first, absorption of moisture and subsequent drying by exposure, perhaps oxidation." Mr. A. Haddon, who has devoted considerable attention to the use of caramel for backing purposes, advises that the crystals be dissolved in an equal part, by weight, of water. A stock solution may thus be made which will keep. We have used some of the caramel solution made as above directed, and it appears to answer its purpose admirably, a coating of the plain solution drying in about fifteen minutes, and when dry the backing being freely soluble in cold water.

The "Primus" Print-trimmer.

W. Butcher & Son, Blackheath, S.E.

The "Primus" lightning print-trimmer consists of a polished mahogany board, with a sharp steel edge on on one side, and a boxwood rule running at right angles to it along the top. The trimming



is done by means of a stroke with the cutting blade against the steel edge of the board. The trimmer is made in box pattern, as shown in the illustration, and thus is useful for keeping unmounted prints, &c., until required for use. We have made a trial of the trimmer, and find it answer its purpose admirably.

"Summer Tours in Scotland."

David MacBrayne, 119, Hope-street, Glasgow.

This is an excellent guide to the tours arranged by Mr. MacBrayne, whose service of steamers, &c., is very popular with visitors to Scotland. Minute accounts of the many trips are given, and the book, which is copiously illustrated with reproductions from photographs by Wilson & Valentine, includes a time-table and tourist programme. It should be instrumental in tempting many holiday-makers north of the Tweed this summer.

The Lightning Plates.

Manufactured by Cadett & Neall, Ashtead, Surrey.

Messrs. Cadett & Neall lately sent us samples of their most recent manufacture of plates, for which a hitherto unknown speed is claimed. Our trial of the plates leaves us in no doubt of their exceptional rapidity. Among our exposures was one made, at five o'clock in the afternoon, upon a view embracing bright sunlit foliage, within a few feet of the camera, a middle distance of darker foliage, and a housetop, situated at a distance of about fifty yards, cutting against the clear sky. With an exposure of the hundredth of a second, the lens being diaphragmed down to *f*-16, and metol development, we secured a well-exposed negative. Obviously, therefore, the latest batches of the Lightning plates are wonderfully fast, as, from the details given, it can readily be deduced that, on more favourably illuminated subject, such as a seascape or an open landscape, a much shorter exposure could have been safely given. To what further pitch of sensitiveness will the plate-makers ultimately take us?

News and Notes.

Erratum.—In our article last week on Sanderson's camera, page 332, the word "filled" (line 29) should read "fitted."

Messrs. Speaight Bros., photographers, announce an exhibition of children's portraits, which will remain open till July 20.

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, June 2, at eight o'clock. *Novitas Stripping Film P.O.P.* demonstration by Mr. W. D. Welford.

ST. PETERSBURG EXHIBITION OF POSTERS.—Information has been received from the Foreign Office, through the Science and Art Department, respecting an International Exhibition of Artistic and Coloured Advertisements, to be held next November at St. Petersburg, by the Imperial Society for the Encouragement of Art, under the patronage of Her Imperial Highness the Princess Eugénie d'Oldenbourg. The Princess has written to the British Ambassador at St. Petersburg, requesting him to make the Exhibition known in England.

MAKING IT PLAIN.—A venerable and pompous English bishop was having his portrait painted by an eminent artist. After sitting steadily for an hour in silence, the Churchman thought he would break the monotony with a remark. "How are you getting along?" he inquired. To the astonishment of the bishop, the knight of the palette, absorbed in his work, replied, "Move your head a little to the right and shut your mouth." Not being accustomed to such a form of address, his lordship asked, "May I ask why you address me in this manner?" The artist, still absorbed in his work, said, "I want to take off a little of your cheek." The bishop collapsed.

THE LIMITS OF THE UNIVERSE.—American astronomers are much interested in some conclusions reached by Professor Newcomb in his recent investigations. The Professor maintains that astronomers have been over-estimating the distances of the stars, and that our universe has a well-defined limit, after all. It appears from recent observations that faint stars are not necessarily dim because of their great distance, as we have hitherto assumed, but may be intrinsically dull, and comparatively near at hand. It has been found, for instance, that the companion star of Sirius is not nearly so bright as Sirius, and that dim, and even dark, stars are quite common, as common perhaps as bright ones, in the universe. As to the limits of the universe, Professor Newcomb seems to think that, with improved telescopes, we shall yet be able to explore them, in other words, observe even the remotest of stars. His conclusion, of course, refers only to the universe of which the earth and solar system form a part. How many eternal galaxies there may be in the abyss of space beyond the reach of our observation is another question.

THE FORTHCOMING EXHIBITION AT THE CRYSTAL PALACE.—The adjourned meeting of the trade was held at 12, Hanover-square, on Monday, May 24, Mr. Frank Bishop (Messrs. Marion & Co.) in the chair. The minutes of the last meeting were read and confirmed. Mr. Horace Wilmer and Mr. Child Bayley were asked to join the meeting, and the former stated that he had been desired by the Earl of Crawford to state, on his behalf, that it was through inadvertence that he had taken the chair on the previous occasion, as it was the intention of the Society that the members of the trade there assembled should be free to discuss the matter amongst themselves. With reference to to-night's meeting, the Council of the Society would be glad of any suggestions which the meeting might think fit to make. The meeting then proceeded to elect ten delegates to represent them on the Exhibition Committee. The Secretary was instructed to communicate with those gentlemen elected who were not present with a view to securing their assent to act. It was unanimously agreed to recommend to the Council that the value of the Exhibition would be greatly enhanced if the Council were to appoint jurors to draw up a full report upon the exhibits, whether medals were awarded or not.

RESPECTING the curious phenomenon mentioned in *Nature* of May 13 (see last week's JOURNAL), a correspondent writes to our contemporary: "The phenomenon is undoubtedly subjective, and has to do with the fatigue of the retina. I observed it very markedly in the case of an orange round which I was skating on the open-air ice rinks in the Engadine, all the country about being white, and the ice, too, being dazzling. The blue-violet margin to the orange was zero, or at a minimum, when I fixed my eye on a point on the orange. It was at a maximum when I glanced quickly round the orange, or when the orange rolled. In the latter case it was unsymmetrical and 'trailed.' I satisfied myself, by the experiments that I tried, that the portion of the retina protected from the white glare by the image of the orange received an impression of blue-violet light when the protection of this image was removed, owing to the movement of the eye or of the object, but that this peculiar condition of the portion of the retina in question was very transitory. It is possible that temperature affects the phenomenon indirectly, since the eye may be more unsteady, and wander more, when the temperature is low. Experimenting in England with less white and dazzling ice and landscape I found the phenomenon less marked. It was very brilliant and beautiful in the Engadine."

"EDISON'S latest idea, on which he is now engaged in making experiments," says a contemporary, "is the reproduction of theatrical performances without the instrumentality of manager or actor. The great inventor's idea is so to improve the phonograph and the kinetoscope that they will reproduce with absolute fidelity. In the case of the former, the chief difficulty was in overcoming 'the metallic character of the tone of the phonograph, and the change of its timbre to that of the human voice, so that all the modulations of the singers and actors could be exactly reproduced, and the synchronisation of the phonograph with the kinetoscope reproduction.' For this reproduction the stage is entirely cleared, and in the place of the scenery a white sheet is stretched from the flies to the stage. Behind the curtain a number of phonographs, capable of multiplying sound a hundred times, and corresponding with the number of actors in the cast, is placed. Each of these phonographs contains the part of one of the characters. In the gallery, concealed from the audience, is the kinetoscope, containing some 300,000 to 400,000 photographs, which will be thrown on the sheet at the rate of forty-eight per second, so that they appear to be continually moving without any interruption. Both the phonographs and the kinetoscope are to be worked by electricity connected on the same circuit, so that the suiting of the action to the word and the word to the action will be carried out without any other difficulty than that the original actor should have done so. If 'the Wizard' succeeds, and his past successes strengthen the belief that he will, society will have to modify its view of the actor, for his art will not be dead when the curtain has been rung down upon his performance.

Patent News.

THE following applications for Patents were made between May 12 and 19, 1897:—

ANIMATED PHOTOGRAPHS.—No. 11,543. "Improvements in the Photographic Reproduction of Moving Objects, and in Apparatus for Viewing and Exhibiting the Photographs Produced." S. D. WILLIAMS.

COLOUR PHOTOGRAPHY.—No. 11,612. "Improvements in or relating to the Art of Producing Photographs in Natural Colours." J. JOLY.

FILM-HOLDER.—No. 11,867. "Photographic Film Developing Holder." W. H. EDWARDS.

CAMERAS.—No. 11,880. "Improvements in Cameras used in Photography." R. L. FOSTER and A. FOSTER.

PHOTOGRAPHIC PICTURES.—No. 11,923. "Improvements in or relating to Apparatus for Exhibiting Photographic Pictures." C. M. HEPWORTH.

PHOTOGRAPH FRAME.—No. 11,938. "Combination Flower-stand and Photo or other Frame or Holder." M. E. M. GRANTLEY-NORTON.

FILMS.—No. 12,017. "Improvements in the Production of Films and in Apparatus therefor." J. WHEELER.

ANIMATED PHOTOGRAPHY.—No. 12,052. "Improvements in Cameras for 'taking' Kinetoscopic and similar Photographs or Animated Pictures." C. GRAYSON.

ANIMATED PHOTOGRAPHY.—No. 12,053. "A New or Improved Apparatus for Developing Kinetoscopic, Cinematograph, and similar Photographic Films." J. RILEY, W. RILEY, and E. N. ROFF.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
29	Polytechnic	Excursion: Highgate and Hampstead. Leader: F. Parker.
31	Halifax Camera Club	*Treatment of Figures.* Rev. F. C. Lambert, M.A.
31	North Middlesex	Informal Meeting.
June.		
1	Aintree	Byron's "Roll on, thou Deep."
1	Brixton and Clapham	Members' Open Evening.
1	Gospel Oak	*Bromide Developing.* W. J. Ramsey.
1	Hackney	*The Stigmatic and Dallmeyer-Bergheim Lens.* Mr. Beckett.—Excursion Prints: Judge's Criticism.
2	Edinburgh Photo. Society	Thirty-seventh Annual Meeting.
3	Leeds Photo. Society	*The Art Phase of Photography.* W. Howgate.
3	London and Provincial	Paper by A. Mackie.
3	Photographic Club	*Novitas Stripping Film P.O.P.* W. D. Welford.
3	Polytechnic	Show of Cameras.
5	Oldham	Excursion: Smithills Hall. Leader, J. Hall.
5–7	South London	Excursion: Guildford. Leader, Mr. Dickinson.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 25,—Technical Meeting,—The Earl of Crawford, K.T. (President) in the chair.

OBJECTS OF INTEREST.

Mr. H. W. Bennett presented to the Society a curved dark slide and focussing screen, made about 1856 for use with Sutton's water lens. He also exhibited a camera, specially built by Mr. Park for architectural photography, with double the usual range of rising front and a similar degree of side movement.

Mr. Ernest Marriage showed a camera specially designed for the same purpose, possessing also an arrangement for swinging the back to an abnormal extent.

OPTICAL EFFECTS OF INTENSIFICATION.

Mr. CHAPMAN JONES, F.I.C., F.C.S., read a paper upon this subject, which he prefaced by a reference to his communications to the Society, and to the Society of Arts, and the Society of Chemical Industry, upon the chemistry of mercurial intensification, stating that his investigation of the optical effects fully confirmed the inferences which he based upon the examination of the chemistry of the processes, and that in some cases they emphatically proved that the ferrous-oxalate method was the only kind of mercurial intensification that did not, by its very nature, give irregular effects. As the chemical effect of intensification with ferrous oxalate was simple and regular, he had endeavoured to determine the proportion of the optical effect, and a series of experiments had led him to adopt the multiplier 1·45 as the figure by which the opacity logarithms should be multiplied to determine this point, the agreement of the opacity logarithms calculated by means of this multiplier and those obtained by experiment being very close, as was shown by the tables. To obtain exact results by intensification, the negative must be free from the dark-coloured products of the oxidation of the developer, and the image should be of pure silver. The best clearing solution that he knew of was made by adding about five drops of a ten per cent. solution of caustic soda to an ounce of water, fresh quantities being used until colouration of the solution ceased. Another precaution essential to securing good results was ths soaking of the negative for two or three minutes in hydrochloric acid, about one to sixty of

water, before applying the mercuric chloride. Ammonia, silver potassium cyanide, and sodium sulphite exercise a reducing, as well as an intensifying, action, and the changes produced were therefore irregular and uncertain; the first-mentioned, however, was recommended as the best intensifier for negatives of black-and-white subjects, provided permanency was not required, because it did not finally give intensification of the thinnest deposits.

Mr. F. E. IVES had noticed the failure of mercury and ammonia to intensify the weaker details, which, for some purposes, was an advantage. He used the method for compensating to some extent for the shortened scale of gradation in the photographic process, applying a weak solution of mercuric chloride for a period only sufficient to affect the thinner details, and thus fully intensify the shadows, while the density of the denser parts was only slightly increased. To ensure the permanence of negatives intensified with mercury and ammonia, he recommended that a little ammonia should be left in the film, which, when dry, should be varnished with a waterproof varnish.

Mr. H. T. MALBY asked how to deal with ferrous-oxalate intensification when the washing water was heavily charged with lime?

The Rev. F. C. LAMBERT asked whether the printing values of intensified negatives agreed with the opacity readings, and expressed the opinion that the influence of colour upon the printing value was greater than could be readily imagined from an optical examination.

The PRESIDENT inquired as to the permanence of negatives treated with mercuric iodide.

Mr. CHAPMAN JONES, replying to these and other questions, agreed with Mr. Ives as to the effects of partial intensification, but said his aim had not been to do partial work, because partial intensification, although in some cases improving the photograph, must upset the ratio of intensity obtained by development, and was always uncertain in its result. The trouble arising from the presence of lime in the water might be obviated by soaking the plate in distilled water before and after applying the oxalate, or by adding ammonium oxalate to the water and allowing the lime to precipitate; but, if the negative were varnished, the printing value of oxalate of lime upon it would be destroyed. The printing value of coloured portions of a negative would differ from the readings; but, in his experiments, he had sought negatives of pure black and white, or grey. Iodide of mercury was uncertain in action, and negatives intensified by it were very liable to change, and he therefore had not taken it into consideration. Schlippe's salts produced too much intensification, and could only be used partially, the result being that gradation was upset, and one could never be certain of obtaining definite results.

PHOTOGRAPHY OF FLOWERS.

Mr. H. T. MALBY read *Some Notes on the Correct Rendering of the Colours of Flowers*. Having first noticed the considerable advance towards truth of rendering which was made possible by the introduction of isochromatic plates, he said that, working with ordinary plates, he found that a much better rendering of the yellows was obtained by giving the longest exposure possible without altogether overdoing the other colours, and this was illustrated by a series of six slides, representing daffodils; but the best result was obtained on an isochromatic plate without a screen. Extremely rapid isochromatic plates were very useful in the case of frail, delicate flowers, which were much given to changing their position during exposure. Succeeding slides showed the advantage of using a yellow screen for the purpose of allowing the foliage time to impress the plate before the brighter flowers were blocked out, the use of a deep yellow screen for colours approaching blue-violet and yellow-red, and different renderings of the same subject on isochromatic plates without a screen, and with different varieties of screens. The Burchett screen appeared to possess considerable advantage where the green of the foliage was associated with the colour of the flower, but the very serious increase of exposure necessary rendered it a risky tool to use on account of the liability to change of position displayed by so many kinds of flowers. With a large number of flowers, particularly where the colour was yellow, he found it unnecessary to use any screen; the present makes of isochromatic plates rendered it possible, by variation of exposure and development, to get a fairly faithful rendering of their colours in black and white, so long as they were not contrasted with objects of a different colour.

Mr. CHAPMAN JONES, referring to one of Mr. Malby's slides, in which a warm tone had been produced by intensification with sodium sulphite, said that many intensifiers had an entirely different effect on lantern plates to that which they gave on ordinary plates, though it was difficult to say why this should be the case.

Mr. W. E. DEBENHAM said he had found, though his experience was not recent, that isochromatic plates rapidly deteriorated and gave foggy results.

Mr. H. W. BENNETT remarked that flowers of apparently identical colour appeared to behave differently as regards action on the plate, and that he had found some difficulty in deciding the proper screens to use in particular cases.

The PRESIDENT, and Messrs. OAKDEN, BEESON, and others expressed the opinion that the keeping qualities of isochromatic plates were equal to those of ordinary plates, and

Mr. MALBY said he had had no reason to suspect their keeping qualities, but he had had considerable reason for suspecting the manner in which they were stored by many dealers, by which they were affected more than by age. As to the use of screens, he thought the difficulty arose from the fact that in many flowers that which appeared to be a ground colour was rather a mechanical mixture of minute filaments, the appearance of which, when cursorily examined, might mislead one as to the proper screen to be employed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 20,—Mr. R. Beckett in the chair.

The CHAIRMAN welcomed Mr. J. W. Goldsbrough, of Port Elizabeth, who showed a large number of photographs of South African life, and portraits of Mr. Rhodes and other pioneers of civilisation in that country.

ARCHITECTURAL PHOTOGRAPHY.

Mr. C. H. OAKDEN, in his paper on *Architectural Photography*, commenced by saying that there were two points of view from which this work could be approached, namely, the technical—by which he meant the delineation of such parts of the buildings as the details and the enrichments, &c.—and the artistic, that is, in which a certain amount of thought and study in the composition and balancing of light and shade was required. He saw no reason himself why the photographer should not embody both of these in his work. Of course, a camera was required, and the square form was very useful for this class of work, for the reason that it was often found necessary to raise the lens as far as it would possibly go. The focussing screen was best ruled in squares, as shown, inasmuch as it was possible by its means to ascertain approximately whether the adjustment of the camera was good or not. A form of focussing screen, which was claimed to be a little more transparent, was made by fixing an unexposed plate, and, after washing, putting it to soak in a weak solution of sulphuric acid, after which it was treated with a weak solution of chloride of barium and left until a slight deposit of white took place. It was then dried, care being taken not to touch the surface. As regards the lens, the landscape form was practically useless, and the ordinary rapid rectilinear of very limited use. The most useful were the wide angles, preferably of the portable pattern. A lens of a wider angle than was absolutely necessary for the inclusion of the amount of subject required should not be used. In selecting a wide angle for use, it was suggested that the photographer should try it with a camera at least two sizes larger than the one he intended the lens to be used with, as he would learn more from this of the actual capabilities of the lens than by any other way. He would then know how far he could safely raise his front, the circle of illumination being known, and the quality of the definition of the lens, when used in any particular position, would be seen. Of the recent introductions—the anastigmats—some he found to work exceedingly well, but experience told him they were not all equally good. The tripod, of course, had to be absolutely rigid, and, in working on marble or other shiny floors, should be shod, cork or any similar material answering the purpose. A plate should be selected which contained a fair amount of silver, starved plates being useless for this class of work; and it could be of the ordinary or isochromatic type. The latter was advantageous in the choirs of cathedrals, for instance, where there was generally a lot of dark furniture, and in situations where the light admitted by the windows called for its use. Mr. Oakden always backed his plates. As regards the exposure, there was no rule, the best guide being experience. Its length varied from a few minutes to several hours; but, as a suggestion, he said that, taking plates of the rapidity of the Castle, or Barnet, or Ilford Empress plates, with the lens stopped down to *f*-32, and, with a good light, the naves of the majority of the cathedrals might be photographed in about a quarter of an hour. In development, opinions differed; some liked to feel their way with tentative development, others preferred rapid action. Perhaps the latter was preferable in the case of windows in the subject likely to give halation. In working on the outside of a building, the greater part of the exposure was best given in diffused light, with a little sunlight to finish up, thus avoiding the hardness which the latter alone gave. For interiors, days when the sky was full of bright clouds with intervals of sunlight were suitable times, yielding softer effects. Subjects with northern aspects were best taken in the early morning or late at night in the summer months, this being the only period when that part of the building was reached by the sun. As to which of the two, it depended upon the orientation of the building, which varied according to the day of its patron saint. In the selection of the point of view, careful study of the effects of light and shade should be made, as well as the subject generally, and Mr. Oakden also laid stress upon the photographer endeavouring to ascertain the views held by the architect, and to do justice by them.

Examples of Mr. Oakden's work, in the shape of prints and slides, were then shown.

Mr. OAKDEN, replying to a criticism by Mr. Welford, insisted that artistic results could be obtained by a sufficient study of the subject.

The CHAIRMAN, in putting the vote of thanks, also expressed himself in the interests of artistic treatment of architectural work.

Dulwich Photographic Society.—The above Society held its first annual supper at the Montpelier Hotel, Choumert-road, Peckham, on Tuesday, 18th inst., when the members and friends sat down to en excellent repast, for which great credit is due to Mr. Row, the proprietor. After supper, a very pleasant musical evening was spent. The programme, which was under the able direction of Mr. E. W. Beer, opened with an overture by Mr. E. Conby, followed by the toast of "The Queen and Royal Family," which was most loyally received, after which Madame Whitfield Rose sang as a solo "God save the Queen," the company joining in. During the evening Madame Whitfield Rose obliged with "Come Beloved," "By the Waters," "The Dream of Home," "Lousiana Loo," and "The Flight of Ages," all of which were rendered in such a charming manner that it would be difficult to draw any distinction between them. Mr. Conby sang, in very good style, "In Cellar Cool;" Mr. Carlyle, "Sally in our Alley," "Killarney," and "The Promise of Life," all of which were well received. Mr. Jackson (Chairman of the Society) treated the company to "The Winkle's Wedding," which greatly amused his brother photographers and visitors, and, following that, Mr. Carlyle and Mr. Dye sang "The Sailor Sighs," Mr. Harry Dye singing, later, "Bid me to Love." Mr. G. Smith was in fine voice for "The Kings of the Wain;" Mr. R. Beale was exceedingly humorous in "The Story of a Musical Box," "The Scientific Man," "Ennis," and "The Penny Whistler;" Mr. Oakenfull obliged with "Ooperzutic," producing roars of laughter. During the evening the following toasts were proposed: "The President and Vice-President," by Mr. F. Thomas; "The Dulwich Photographic Society," by Mr. C. Dunlop (in proposing which he alluded to the fact that, although a young Society, it was making rapid strides, and an Exhibition was held last year, when the exhibits were up to a very high standard; he also remarked that an excellent list of excursions had been arranged by the Excursion Secretary, of which he had no doubt the members would avail themselves); "The Officers and Committee of the Society," by Mr. G. Smith; "The Ladies, Honorary Members, and Visitors," by Mr. Oakenfull, all of which were ably responded to. The evening closed with "Auld Lang Syne."

Hackney Photographic Society.—May 18, the President in the chair.—The Excursion Secretary read report of excursion to Buckhurst Hill on the preceding Saturday, and gave notices for future outings. Mr. Borrow showed some excellent X-ray photographs produced by means of a Wimshurst machine. Mr. C. L. Burdick then showed and demonstrated

The Aerograph,

an improved form of the Fountain Air Brush. It is an instrument for applying pigment by means of an air spray, and is so constructed that fine lines or coarse may be made at the will of the operator, and any liquid water colour may be used. Mr. Burdick showed some of the capabilities of the instrument by drawing in a very short space of time three life-sized heads, and the beautiful gradation and softness of these were much admired. The demonstrator also showed practically how the aerograph could be used for working up bromide work, &c.

FORTHCOMING EXHIBITIONS.

1897.	
June 23–30	Paper-makers', Printers', Stationers', Fine-art Publishers', &c., Exhibition, Royal Agricultural Hall, Islington, London, N. Managing Director, W. E. Aylwin, 27, Leadenhall-street, London, E.C.
December 9–11	*Aintree Photographic Society.

* There will be an Open Class.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CONVENTION.

To the Editors.

Gentlemen,—Reading the suggestion in the letter by "P. R. S.," last week, that members might find it difficult to obtain rooms during the Convention week, I made it my business, when in Yarmouth on Saturday, to make inquiries if such difficulty were likely to exist. Every one ridiculed the idea of 400 or 500 additional visitors, coming into the town at that time, not being able to find ample and suitable accommodation.—I am, yours, &c.,

R. W. Howes.

East Dereham, Norfolk, May 24, 1897.

THE FADING OF PRINTS.

To the Editors.

Gentlemen,—Referring to your interesting article *re* "Fading of Silver Prints," as a user of both gelatine and collodion paper, I can say that in the ordinary way of business both these papers have proved permanent with me. With as much or more care, with albumen paper, I could never secure prints from yellowing rapidly. If any one who has watched the show-cases of the large view publishers, as I have done, sees this, he can confirm my statement, that the albumen prints in all of them deteriorate rapidly. I mention these as being very large producers of prints, and probably taking all precautions for permanence.

My own gelatine prints have been done with no more or less care than albumen, and have stood a year or two in show-cases unharmed. This never could I say with albumen.—I am, yours, &c.,

J. G. M.

REFERENCES.

To the Editors.

Gentlemen,—I was extremely pleased to note the able article on *References* by Mr. J. A. Randall.

Undoubtedly "references" are very unreliable, as therein stated, in most cases those least qualified getting the best reference, in order that there may be no unpleasant scene at the conclusion of the engagement.

As an assistant, I can honestly say that the best situations I ever obtained were those where the employer took me on my bare word, and neither asked for nor received a reference; in fact, to this day, if I apply for a situation, and there is much ostentatious demand for references, I invariably "cry off" without further ado.

Where an assistant is prepared to stand on his merits, why should he not be allowed to do so? Surely this is the fairest to all concerned. Of course, where an engagement abroad for a term of years is under consideration, it is a different thing; but, in this country, where short terms are the rule, the demand for references of questionable value at the best is ludicrous, as a day or two would reveal the ability of the *employé*.

Looking at the matter from another point of view, take the case of an assistant, who has worked for a firm where every invention for the production of the best work is in use, and where every labour-saving device has been adopted; and supposing an employer has had an assistant, who has worked under these conditions, who is desirous of leaving, and gives him a really truthful character, excellent in every way, the said assistant going afterwards to a firm where none of the conveniences referred to exist, and where, as a consequence, he is placed at a great disadvantage, the latter employer naturally thinks that the reference is not only highly coloured, not to say untruthful, to the prejudice of the reputation of the former, but is also inclined to blame the assistant, whose lot is therefore rendered most uncomfortable. It would seem, therefore, that, as the conditions of work, &c., are so unequal, the only course open is to test an applicant and decide the case on its merits—not a difficult matter in this country, with applications coming from the very town in which the advertiser resides.—I am, yours, &c.,

Assistant.

APPRENTICES: A WARNING.

To the Editors.

Gentlemen,—The following account has been sent to me. I forward it, trusting you will publish it in your columns as a warning to parents and guardians. I hope those who may read it will not conclude that it applies to photographic employers. What the letter proves is that the photographic profession is made the field of operations of men knowing nothing of photography, they merely using it as a medium for finding dupes.

"Mr. John A. Randall.

"Dear Sir,—I have received with the greatest pleasure your little pamphlet, *The Photographic Worker*. It is just the thing needed for photographic assistants. . . . I was formerly a compositor. The following facts will interest you, and prove the great need for your work. Looking over the columns of the daily paper, I came across an advertisement worded something after this style:—'A splendid chance to get a thorough knowledge of photography in a first-class London studio. Premium, 100*l*. Salary, 25*s*. first year, 30*s*. second year, and 35*s*. per week third year.'

"I made due inquiries, and felt satisfied that I had something to rely on. The advertiser gave me a good reference from his assistant, who had entered into an apprenticeship on the same plan, and paid the same premium (100*l*.). A contract was duly signed and legally stamped, and my apprenticeship to photography began. The premium was a big one, but I felt confident that the contract would be honestly carried out. All went well for about five months, and I received my 25*s*. every week. My employer then approached me with a scheme he had in view. He intended, he said, to start an enlarging trade by post. He had no capital, and was intending to advertise for a partner. He gave me a most deceptive account of the enlarging trade, leading me to believe (I was ignorant of photographic conditions) that only one firm had a postal trade in enlargements. With such small competition, he said, the chances were unequalled for making 'a good thing' out of it. This was no speculation, it was sure; and, if I could find my way to become his partner (not that he cared a jot, so he said), it would mean future prosperity for myself, and an additional income besides my ordinary salary.

"I finally decided to embark on the venture. Articles of partnership were filed, and I provided 80*l*. (45*l*. as the working capital, and 35*l*. which he demanded as premium for the use of his premises for enlarging). The partnership agreement was good for three years. He provided the 'business experience,' which I found out afterwards was *NIL*. The whole thing turned out to be a monstrous gambling speculation on his part. He could not even make a proper enlargement. In about three months' time we gave up the business. I lost 80*l*. He lost nothing, but gained his 35*l*. charged as premium. Besides that, he had borrowed 12*l*. privately from the working capital, promising to pay back in a week, but he has *never* done so, and *never* will.

"Worse was to follow. Shortly after my venture in the enlarging department, my employer began to be irregular in paying my wages. I very soon discovered that he was utterly unable, and *always had been unable*, to pay me One Penny a week! He was failing in business, and had propped himself up by getting big premiums from apprentices. At last he told me frankly that he could never fulfil the contract, and had not a penny of his own.

"This man knew very little about photography, and all his work was turned out by 'green hands' or apprentices. Briefly, I have lost 100*l*. as premium, and about 30*l*. he owes me as wages for the first year. This does not count the 80*l*. I lost in the enlarging venture.

"And I have not learned photography; my experience is twelve months only, and now I must look for a situation on the strength of one year's experience. My prospects are completely ruined.—Yours sincerely,

"The Victim."

On this letter, in the words of the Fleet-street scribes, "comment is superfluous." I think, not a single person will read it without indignation; it is a "plain, unvarnished tale," the lessons of which are obvious.—I am, yours, &c.,

John A. Randall.

42, *Tonsley-hill, East Hill, Wandsworth, S.W., May* 19, 1897.

A WARNING.

To the Editors.

Gentlemen,—I am informed that a tall young man, who signs himself "Pat N. Conroy," has been calling upon certain firms in London, using my name and that of my partner, Mr. Dawbarn, and begging or borrowing small sums. I know nothing whatever of the man, and his statements as to position offered to him by Mr. Dawbarn and myself are absolutely false. In one case, where he succeeded in borrowing money from an assistant in the absence of the principal, Conroy stated that he had obtained an engagement with Guy & Co., of Cork. On writing to this

firm, requesting reply by wire, I hear that he has no position with them. I am informed that he speaks with a distinctly Irish accent, calling Cork "Cark." I trust this warning may be useful to photographers, and I shall be glad to hear of any other cases in which the same tactics may be attempted or may have been successful.—I am, yours, &c.,

6, *Farringdon avenue, E.C., May* 18, 1897. H. SNOWDEN WARD.

[We have been honoured by an unsuccessful visit from the young man alluded to by Mr. Ward.—EDS.]

THE LONDON (POSTAL) STEREOSCOPIC CLUB.

To the EDITORS.

GENTLEMEN,—I should esteem it a favour if you will kindly allow me to draw the attention of your readers to the above Club, now in course of formation, some of the principal features of which are as follows: (1) A cyclostyle-printed journal—the *Stereoscopic News*—will be issued monthly and sent to each member. (2) There will be several circulating packets (one for every twelve members) of prints and transparencies. (3) The appointment of local representatives, whose duties will be to point out, and give information respecting, the most interesting features of the particular districts in which they reside. (4) The supply of apparatus, &c., to members at greatly reduced prices, effecting, in many cases, a saving of as much as 5*s.* in the £. The subscription will be 1*s.* per annum.

I shall be pleased to send further particulars to any ladies or gentlemen desirous of joining the London Stereoscopic Club.—I am, yours, &c.,

C. L. CAMASCHELLA.

10, *Derby-villas, Forest Hill, S.E., May* 24, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

A. M. Z.—Nos. 2, 3, 1, and 4 in order of merit.

A. W. H. (Tunbridge Wells).—We believe yours is by no means a solitary case. The County Court might be resorted to with some chance of success.

FORMULÆ WANTED.—F. O. EAGER. Your question is rather vague. Do you want developing and toning formulæ, or formulæ for preparing the papers you name?

WASHING EMULSION.—B. If the emusion is always washed under the same conditions, it will take only the same time. We do not know what variation you make.

SCRATCHED BURNISHER.—THOS. BOUCHER. The prints show that there are transverse scratches on the burnishing bar. They can only be got rid of by working them out on an oilstone. As they do not appear to be very deep, it will be easily done. Work the bar longitudinally on the stone.

BACKGROUND MATERIAL.—W. C. ROBINS. The best material to use for backgrounds, by the powder method, is the common unbleached sheeting of the furnishing warehouses or drapers. It may be had eight or nine feet wide, we believe. Brown paper (carpet paper) is quite unsuitable for the powder method.

WAGES.—W. W. W. As you left suddenly, and of your own accord, although through a quarrel, you cannot recover the five days' wages, as you are not entitled to them. Your late employer can sue for the amount of a week's wages for your leaving his service without giving proper notice, and don't be surprised if he does so.

SAVING WASTES.—R. WARDELL. 1. Working as an amateur, and consuming so little material, as we gather from your letter you do, it will certainly not be worth while to save the residues, particularly as the papers you use contain very little free silver to recover. 2. Four ounces of hyposulphite of soda to the pint of water is the best proportion to use.

OLD NITRATE OF SILVER.—A. BRIGG. The crystals of nitrate of silver being discoloured will be of no detriment whatever, whether it be used for a negative bath for collodion or for sensitising paper. Indeed, for the former, crystals of nitrate of silver that had been exposed to light and become discoloured have been advocated, as being preferable to new crystals.

ALBUMEN PAPER.—R. WILSON. There is always a risk attending buying things at a sale, and that you have incurred. There seems to be no doubt that the paper is by the makers whose trade mark it bears, but they are in no way responsible to you. It has evidently deteriorated by keeping, and that is possibly the reason why its previous owner got rid of it in the way he did.

SALTED PAPER.—S. WILCOX asks where plain salted paper, such as was used in the old days for sensitising with ammonio-nitrate of silver, is to be obtained?—So far as we are aware, no such paper is now in the market, hence, perforce, our correspondent will have to prepare it for himself. Formulæ for it will be found in the early editions of Hardwich's *Photographic Chemistry*, and in all the early manuals of photography.

COLOURING PHOTOGRAPHS.—R. GAGE. Wake's book on the subject is out of print, and has been for many years. Newman & Co., Soho-square, publish a work on photographic colouring. It is impossible for us to say how long it would take you to become proficient in the highest class work, that will necessarily depend upon your aptitude. We would suggest that you obtain a few lessons from one who is proficient in the work.

APPARATUS ON APPROVAL.—W. R. writes: "I saw some apparatus advertised for sale that would be sent on approval on receipt of the money. I sent the cash, but the things did not suit me, so I returned them. Now I cannot get my money back or any answer to my letter. What can I do, as I see the same things still being advertised, which is a proof that the man has had them back?"—The only remedy is to sue the advertiser in the County Court for the amount.

EMERY PAPER.—PHOTOGRAVURE asks if there is any finer emery cloth or paper to be had than that sold at the oilshops; and, if so, where?—Very fine emery paper for the use of engravers, watchmakers, and the like is sold, and may be had of the dealers in engravers' materials, such as Hughes & Kimber, or it may be had at most of the dealers in watchmakers' requisites in the neighbourhood of Clerkenwell. It is somewhat dear as compared with the oilshop article, the price being about 6*d.* per sheet for the finest.

TONING.—IN A FIX writes: "Will you please inform me the cause of difference in colour of photographs I'm sending you, both toned in acetate and carbonate of soda? If the blue print has been kept too long in toning bath, is it exhausted or bath too warm?"—The reason of the one print being bluer than the other is that it was toned more. If it had been removed from the bath earlier, it would have been of the same tone; or, had the other been left in longer, both would have been of the same colour. Are you not aware that, the more a print is toned, the bluer is the colour?

AGENCY.—NOVO writes: "I appointed a man as my agent to manage a branch, paying him by commission only. He did not suit, and I discharged him. I now find he has been taking more money than he has accounted for, and, upon taxing him with this, he impudently told me to do "my best and my worst." Kindly tell me if I can punish him through the Police Court?"—No, we believe not, as he was your agent, and not a salaried servant. If he had been, he could be charged with embezzling and punished accordingly. Now your only remedy is to sue for the money he has received in a civil court.

MOUNTING.—A. B. writes: "Be kind enough to tell me: 1. What is the cause of prints buckling or cockling, as it is termed, after being laid down on mounts after being enamelled on ferrotype plates 10×8? They are backed with waterproof backing. 2. When the print is mounted, it shows around the margin and where the glue was applied. How can that be avoided?"—1. The cockling is caused by the moisture of the mountant expanding the mount. 2. By using the glue thicker, or replacing as much of the water used by alcohol as possible, the trouble may be overcome. The latter will also minimise the cockling of the mounts.

STUDIO.—PUCK says: "I shall be glad if you will kindly answer the following questions:—1. I have a studio, north-east light, with glass roof and glass windows all along one side. What colour paper should the other side of the studio be papered with to cast reflections on the sitter? 2. Also what colour blinds or curtains would be suitable for the roof and windows? 3. The best kinds of backgrounds, and where to get same, and what the cost would be?"—1. Light green or French grey. 2. Dark blue or green will be suitable. 3 Ordinary flatted oil backgrounds. Consult the advertisement columns of the JOURNAL and ALMANAC, as it is against our custom to recommend any particular maker's goods.

STALE PAPER.—S. W. N. says: "I bought of a chemist and druggist, who makes a feature, by advertising in the local paper, of photographic materials, half a quire of ready-sensitised albumen paper, paying 7*s.* for it. When I got it home, I found it much discoloured, and, at the edges, had a brown, metallic appearance. When I took it back, and asked for it to be exchanged, or the money returned, he said he could do nothing of the kind, it was ——'s paper, and he sold it as he received it."—Quite so, but not until by keeping it it had become spoilt. Have your money back, if necessary, through the County Court, and in future draw your supplies from a photographic dealer rather than a pharmaceutical chemist, who, as a rule, has little demand for photographic material.

STUDIO.—W. H. P. says: "I shall probably be building a new studio shortly, and should deem it a favour if you would give me your valuable advice. The greatest available length is twenty-three feet, width from twelve to sixteen feet. Supposing the height is right, would this be large enough for all practical work? Either ridge roof or lean-to can be built. Which do you advise? If a lean-to, what height should the lower side of roof be, and what height the upper? Also, what height from floor should glass start, and what amount at ends and sides should be left englazed? I purpose working from both ends."—The length will be short, but the width will do very well. Twenty-three feet will necessitate the use of shorter focus lenses when taking full-length figures and groups than is desirable. Still, there are many studios that are even shorter than that. Either form is good, though something depends upon the aspect. Start the glass about three feet from the floor, and have about four feet to four feet six at the opaque.

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EX CATHEDRÂ.

The Glasgow International Photographic Exhibition, organised by the local amateur photographic association, will be held in the Royal Glasgow Institute of Fine Arts during the months of September and October next, the opening day being Wednesday, September 1, and the closing day October 13. The Exhibition Committee is both numerous and strong, and has apparently been constituted so that it may fully represent photographers in Glasgow and the surrounding districts. The judges are to be Messrs. Valentine Blanchard, H. P. Robinson, Marshall Wane, *Photographers;* Sir Francis Powell, P.R.S.W., William Young, R.S.W., *Artists;* and James Maclehose and T. B. Blaikie, *Special Judges for the Photo-mechanical Section.*

* * *

The following is the schedule of classes. Any printing process may be employed, and pictures may be of any size. Enlargements may compete in any class. A minimum number of pictures, as specified in brackets, must be entered in each class, but any greater number may be sent if desired. There will be no distinction made between amateurs and professionals. Class I. (Portraits and Groups), 1 gold, 2 silver, and 4 bronze medals (3); Class II. (Landscapes, with or without Figures, Seascapes, and Marine subjects), 1 gold, 2 silver, and 4 bronze medals (3); Class III. (Architecture, exterior and interior), 1 silver and 1 bronze medal (3); Class IV. (Animal Studies), 1 silver and 1 bronze medal (3); V. (Scientific), 2 silver and 2 bronze medals, (3); VI. (General Class, Flowers, Still Life, and other subjects not included in other classes), 1 silver and 1 bronze medal (3); VII. (Instantaneous and Hand Camera), 1 silver and 1 bronze medal (6); VIII. (Lantern Slides), 1 silver and 1 bronze medal (6); IX. (Stereoscopic Work), 1 silver and 1 bronze medal (6); X. (Enlargements. Section A—Portraits, Groups, and Figure Studies), 1 silver and 1 bronze medal (1); (Section B—Other subjects), 1 silver and 1 bronze medal (1); XI. (*Genre*), 1 gold, 1 silver, and 1 bronze medal (1). In Classes III. to X. the Judges may award an extra gold medal to work of special merit.

* * *

There is to be a Champion Class; and a Ladies' Competition, open to lady amateurs only. In the Photo-mechanical Section the classes are to be: I. Photogravure; II. Block-process Printing; III. Collotype and Woodburytype; IV. Colour Work. A silver and a bronze medal will be awarded in each class. Tables will also be provided for Exhibits of Photographic Apparatus and Material. The Hon. Secretary is Mr. W. Goodwin, 3, Lynedoch-street, Glasgow, from whom entry forms and all particulars may be obtained.

* * *

We have no doubt that, like its immediate predecessor, the Glasgow Exhibition will result in a great success. The classification is not too minute, nor, in the circumstances, are the medals offered excessively numerous. We shall be curious to observe how the Champion Class is patronised. Owing to the fact that many of our ablest photographers do not now submit their work to competition, Champion classes at photographic exhibitions are no longer representative of the best work of the moment. We are surprised to notice a competition for lady amateurs only. Glasgow is evidently out of sympathy with the prevailing sentiment in favour of placing the fair sex on terms of equality with men.

* * *

Messrs. Wells & Co., Avenue-road, Southgate, send us specimens of what they term Diamond and Diamonette reproduc-

tions of Messrs. Downey's official Jubilee portrait of the Queen. These little pictures, which are gummed on the back, are one-and-three-eighths of an inch and seven-eighths of an inch square respectively.

* * *

Messrs. Walker & Co., Aberdeen, had the honour to receive permission to take a cinematograph picture of Her Majesty's departure from Ballater for Balmoral on Saturday morning, May 22. On several occasions Messrs. Walker have had the distinction of giving limelight exhibitions at Balmoral, and to this they can now add the honour of having secured, by means of the cinematograph, a picture of what is always an interesting incident in the Queen's visit to Deeside, namely, the departure from Ballater Station. The instructions given to the firm were that they might take a cinematograph picture just immediately after Her Majesty's carriage started from the station, and the photograph will therefore be appropriately entitled *The Start for Balmoral*. Messrs. Walker, in order to ensure success in their efforts, had two cameras in position in the station yard. The picture taken consisted of a film about seventy-five feet in length, which was passed across the aperture of the camera in about fifty seconds. The total number of exposures, or photographs, taken in the fifty seconds would amount to about 1200. The picture, from a scenic point of view, should prove a very successful one. The Queen's carriage drove past at no great distance from the camera, and it will therefore occupy a prominent place in the cinematograph. A number of other carriages, however, were moving about in the vicinity at the time, so that the picture will have an animated and lively appearance.

* * *

Messrs. Jacques & Gay, photographers, of 32, King's-road, Brighton, inform us that they have discarded the use of daylight, and have substituted the incandescent electric light, in the adoption of which they state that they are the first in Brighton. We are not aware of any other instance of the entire abandonment of daylight for studio work. We make two extracts from Messrs. Jacques & Gay's circular, which prove that the firm is not deficient in enterprise and willingness to study the convenience of their sitters: "Ladies wishing to be photographed in ball or dinner gowns can have sittings by appointment at any hour, either on their way to, or on returning home from, any entertainment." "Messrs. Jacques & Gay keep a good selection of Greek and classic robes and draperies of every description for the use of their patrons, and arrangements can be made to procure any style of fancy dress that may be desired."

* * *

We select this opportunity of reminding our readers and correspondents that we cannot undertake to answer communications through the post. An announcement to this effect is published weekly in the Journal, over the Answers to Correspondents. The rule may admit of certain exceptions, but its general necessity is obvious. The usual channel of communication between an editor and his readers must, of course, be the pages of the paper. In these enlightened times it should not be required of us to make mention of this fact; but, as we constantly encounter considerable misconception on the point, it is desirable that attention should be directed to the rule, which is almost generally observed by the English press, of denying replies to questions through the post.

An inexcusable neglect or ignorance of this rule is the frequent cause of inconvenience and disappointment to correspondents. The latest victim to the consequences of his own neglect in this respect is a Mr. W. Rose. This gentleman some weeks ago addressed to us some questions relating to studio construction, and was duly answered in the Journal of May 14. He evidently did not take the trouble to read our Answers to Correspondents, and exactly a month ago after the date of his first communication he allowed himself to write us the following on a post card:—

"Sir,—Some weeks ago I asked you for a few instructions in studio building. Now, even if it is not the rule to answer by post, it would have cost you nothing to have said so, as a stamp was enclosed; it is not even courteous on your part, much less obliging. I suppose, whether it is the rule or not, had there been a good 'tip,' or I had a long tail to my name, you would have obliged; however, I am now quite independent on the matter, as I know all I wish for. One party I wrote to answered and said they could not tell me, and advised writing to you. Perhaps you, like them, don't know, but haven't courage to say so."

* * *

The author of the post card is, as we have said, a Mr. W. Rose. He dates from Westcott-street, Dorking. The only remark which this production calls for is that it enjoys the distinction of being the least polite communication we have ever received, and that it emanates from a non-reader. Upon the latter fact we go the length of congratulating ourselves.

* * *

We take the following announcement from *Dry Plates*: "By the time these lines are read, the firm of Cadett & Neall will have been registered as a joint-stock company. We take this opportunity of informing our customers that the Company will be under the personal management of Mr. James Cadett and Mr. Walter Neall, as heretofore, who retain a governing interest in the Company, formed to extend its trading; but no shares are offered to the public, so do not think you have been left out of a good thing. Our business is one of 'mushroom' growth, and the time is not yet when you may be asked to share our profits. To extend the business and to add that of printing-out papers, &c., to our list of manufactures, means a considerable additional capital, and this has been found by a family arrangement."

* * *

At the Printers', Stationers', and Fine Art Publishers' Exhibition, to be held at the Royal Agricultural Hall, from June 23 to June 30 next, we are promised various attractions to those interested in photography, in addition to the photographic Exhibition. There will be optical lantern shows under the direction of Mr. R. R. Beard, and many of the leading workers in lantern slides have promised selections of their slides. X-ray demonstrations will be given by Messrs. Hurst & Co., of 53, Leadenhall-street, E.C., and Messrs. Newman & Guardia will introduce to the public their new apparatus for the display of animated photographs. No charge beyond that of admission to the Hall will be made, and there will be six entertainments of each kind daily.

* * *

The Renaissance Court at the Crystal Palace, in which the Photographic Section of the Victorian Era Exhibition has been arranged, will be well worth the visit of photographers.

uring the next few months. The exhibits have now been nally arranged, and placed in position in the cases and on he screens, and, by the aid of the particulars attached to hem, can be carefully studied at leisure. The Catalogue ill shortly be ready. We doubt if a more interesting col- ection, illustrative of photographic processes from the intro- uction of the Daguerreotype, has hitherto been got together, nd Messrs. Negretti & Zambra and Mr. E. W. Foxlee are lecidedly to be congratulated on its completeness.

* * *

There is also, we believe, a Photographic Section at the Victorian Exhibition at Earl's Court. Several inquiries as to he nature and contents of the section have reached us, but, s we have not been afforded an opportunity of inspecting it, ve are unable to give the information asked for.

* * *

The following is the Committee appointed to carry out the nternational Photographic Exhibition of 1898 at the Crystal 'alace. Of this Committee of twenty members, one half were ppointed by the members of the trade themselves, and the ther half by the Council of the Royal Photographic Society. The trade members are indicated by an asterisk. Captain W. de. W. Abney, C.B., &c., *Conrad Beck (R. & J. Beck), *Frank Bishop (Marion & Co.), F. A. Bridge, *H. H. Hay Cameron (the Cameron Studio), the Earl of Crawford, K.T., T. R. Dallmeyer, *J. J. Elliott (Elliott & Fry, Elliott & Son), *W. Gamble (Penrose & Co.), A. Haddon, *F. W. Hindley Jonathan Fallowfield), Chapman Jones, J. C. S. Mummery, J. Scamell, *J. Stuart (Ross & Co.), *Paul L. Waterlow Waterlow & Sons), *J. B. B. Wellington (Wellington & Ward), H. Wilmer, *W. J. Wilson (Paget Prize Plate Co.), Sir H. Trueman Wood, M.A.

THE SWING BACK.

The swing back has been somewhat prominently to the front on more than one occasion lately, and, as considerable miscon- ception appears to exist in some quarters as to its proper use and function, we make no excuse for once more bringing the subject forward.

In his paper, read at the Camera Club Conference, Professor Allen made some pertinent and really valuable remarks of a thoroughly practical character, and these have been brought forcibly back to our notice by more than one communication we have received during the last few days with regard to the illustration accompanying an advertisement in our own and other pages last week. Professor Allen says: "It is more than probable that the human eye sees vertical parallel lines of con- siderable altitude as though they slightly converged. At any rate, if a high tower be taken with a wide-angle lens and swing back quite vertical, it seemed as though it was wider at the top than lower down; it seemed, in fact, top-heavy and swollen." This is just the point in connexion with the illus- trations referred to that our attention has been called to by two or three correspondents, who seem inclined to attribute the effect to the particular camera employed, which we need scarcely say is a thoroughly groundless assumption.

It is, as Mr. Allen says, more than probable "that the eye sees parallel vertical lines as if they were convergent"; it is a fact that is open to very easy demonstration, and in consequence, when the eye looks upon the representation of such vertical lines in the form of, say, the Tower and Gateway of Christ's College, Cambridge, rendered with strict parallelism, it instinctively feels that something is wrong, and resents it. If our readers will refer to the illustrations in our last week's advertisement pages, they will recognise, if they have not already done so, what we mean, and will feel that Mr. Allen's description of the effect is a most accurate one. Yet, if the lines be gauged carefully, they will be found to be perfectly accurate, in so far, at least, as their perpendicularity and parallelism are concerned, and the apparent "swollenness" is merely an optical illusion.

Many novices in photography, and for that matter many old hands, are under the impression that, if a rectilinear lens be employed, and the plate swung in a truly vertical position, all the requirements of perfect accuracy have been com- plied with, and such would, no doubt, be the case if the task were merely the copying of a picture; but, when applied to an architectural subject, such as the gateway above alluded to, although the result may be satisfactory in the light of an architect's elevation, it is inaccurate in perspective and artis- tically unpleasing. In saying this, we are in no way desirous of under-rating the usefulness of the swing back; far from it, for the best possible rendering of that same subject, the gate- way of Christ's, without either swing back or front, would be hideous in the extreme—in fact, we must confess to having given that particular subject up in despair when on a visit to Cambridge some two years ago. We are reminded of Shake- speare's dictum, "It is excellent to have a giant's power, but it is tyrannous to use it like a giant," and in applying the swing back, as Mr. Allen says, a "compromise, a slight re- adjustment can often be used with advantage."

We are quite aware that there are many who will argue that any departure from the strictly vertical and parallel is wrong; indeed, some years ago, in the early "seventies," if we remember rightly, the question of the "morality" of the swing back was raised before the parent society—then the London Photographic Society—by, we believe, the late J. R. Sawyer. At any rate, that gentleman championed the slightly converging view, and pointed out the obvious absurdity of representing the Clock Tower of the Houses of Parliament, when viewed from its base, by means of parallel lines. However, the members of the old "London" made the subject lively through two or three meetings, but what was the decision arrived at we do not remember; probably a number of members "remained of the same opinion still."

Should any doubt exist on the subject of the actual con- vergence of the lines of such a subject as, say, the Victoria Tower, let a piece of card be held at a convenient distance from the eye, and, with a fine pencil, mark the width of the Tower as it appears to the eye at the line of sight. Now re- peat the operation, taking great care to preserve the exact distance between the eye and the card, as high up as the lines retain their parallelism, and compare the two measurements. If the second one is not *considerably* smaller than the first, then we can only say that the retina of that particular observer is fitted with an automatic swing back; but the matter can be proved mathematically by calculation, or, more simply still, by plotting out the lines upon a sheet of paper, by which means it is easy to show that the angle subtended by an object of any given dimensions becomes gradually smaller as its elevation increases. The difference is proportionately greater the closer the observer is to the object or the wider the angle of view, and thus it happens that, with wide-angle lenses, and such subjects as the gateway of Christ's College,

this appearance of top-heaviness is more generally noticeable; not that the lens itself has anything to do with the matter, except in so far as it permits a nearer approach to the subject; the point of view alone affects the question.

To give an example, let us suppose such an object as the gateway depicted in the advertisement, measuring 60 feet in the height of the two turrets, and 30 feet between their external outlines. If such an object be observed from a distance of 120 feet, which is about the distance at which a medium angle lens would be available with comfort, the width of the two turrets at the top would, by rough calculation, subtend an angle equal to about 26 feet at the base, or nearly 4 feet less; and, if the point of view were decreased to 60 feet, the distance at which a lens of wider angle would be required, the angle subtended would be equal to a width of about 21 feet at the base, or nearly 9 feet less. Although, in photographing such an object from those standpoints, owing to a variety of causes, the differences in measurements would not be so exaggerated, they are still very appreciable, and we have before us as we write a negative specially taken to illustrate the point. It represents a couple of windows of the same width, one above the other, the total height from the ground of the higher one being only 18 feet. The camera was placed 24 feet away, and carefully levelled, the image being got into position by raising the front as high as possible. At that comparatively low elevation there is a difference in measurements, when tested with a pair of dividers of over a sixteenth of an inch, the upper window being, of course, the smaller, although to the eye it has the appearance of being much the wider.

From what we have said, it would be evident to repeat Professor Allen's suggestion, that a compromise or slight readjustment may often be desirable, nay, may even be absolutely necessary, and that a departure may be made from strictly vertical lines without committing any very heinous sin—if sin at all. It will be in the judicious use of, or abstention from, the swing back, or equivalent appliances, that the competent and artistic photographer will single himself out from the common herd, who will go on content to observe the golden rule of an invariably vertical focussing glass.

Of course, there are circumstances under which strictly perpendicular lines are almost a necessity, as when such fall near the margin of a picture, more especially in the case of lantern slides. What, for instance, could be more objectionable than a cathedral interior with the pillars visibly falling away from the margin of the slide? But, in such subjects as the one we have put forward as an example, there is no reason, but quite the reverse, why the slight readjustment should not be made. We have said that we gave up that subject in despair, not because we could not get swing enough, but simply because, do what we would, it invariably appeared to be wrong somewhere. The gateway of St. John's College forms a similar subject, but admits of free treatment; but, even with that, we could not avoid the "swollen" appearance of the turrets, even though some slight departure from parallelism was indulged in.

Cambridge is rich in architectural test subjects, and probably one of the very finest to be found anywhere is King's College Chapel, either interior or exterior. On the same occasion already referred to, we secured two or three views of the river frontage from various standpoints, but in one of them, taken from the green (the nearest point of view, be it observed), the chapel presents to a slight extent the distorted effect to which we have referred, although in another picture, taken from the meadow on the other side of the river, it is entirely absent.

In another article we shall have something to say on other forms of distortion that have been laid to the charge of the swing back.

Ebonite and Dark Light.—According to an account given to the French Academy of Sciences by M. Becquerel, M. G. le Bon's experiments are to be explained by the fact that vulcanite is transparent to the red and infra-red rays, and they are capable of continuing the action of actinic rays on a plate which has been exposed for a very short time, though they do not exercise any effect on a plate already exposed. The existence of "dark light" is thus rendered unnecessary.

Uranium Radiations.—Referring to this subject at the Royal Institution recently, Lord Kelvin showed on the screen some photographs of coins taken by their aid. He stated, however, that the rays were so feeble that twelve hours' exposure was necessary to obtain an image. Still they were a constant property of the substance, and were manifested under conditions which precluded the possibility of their being only the slow radiation of previously absorbed light. He felt himself unable to offer a solution of the mystery.

Still another Picture Exhibition.—There was opened on Saturday, at the Borough Polytechnic, a Loan Exhibition of Pictures. This is the eighth time that the Committee has got together a fine collection of works of art. Amongst the pictures lent are works by G. F. Watts, R.A., Alma Tadema, R.A., H. Moore, R.A., D. Murray, A.R.A., and other distinguished men. The pictures have been loaned from the galleries of the Hon. W. F. Smith, M.P., Lady Jenner, Mrs. Stanley, and many others, to whom thanks are due for denuding their walls of their treasures for a month or two for the delectation of their poorer brethren. The Exhibition will remain open until June 19, and the admission is free.

Röntgen Rays in Surgery.—Photographers at one time anticipated that the practice of Röntgen-ray work would lead to a practical business gain in the direction of taking sciographs for surgeons, though, after a while, it began to be felt that these expectations had no solid foundation. But we have not heard by any means the last of this matter. For example, M. C. H. Bouchard has sent four notes to the Paris Academy of Sciences on their applications to diagnosis of disease—pleurisy, tuberculosis, hypertrophy of the heart, cancer, &c., and lastly M. Olivier has shown that, by means of the prints obtained in this manner of the exact position of diseased portions of bones, as in *osteo-myelitis*, such a knowledge will be obtained of the exact necessary limits for operation that amputation previously considered unavoidable may now be entirely done away with.

Sutton's Panoramic Camera.—At the last Technical Meeting of the Royal Photographic Society a curved dark slide and focussing screen of a Sutton's panoramic camera was presented. It was said to have been made about 1856. That is an error, as the apparatus was not made before 1860. The lens was patented by Sutton on September 28, 1859, No. 2193, but it was not in the market till the end of 1860 or the beginning of 1861. It was described in a paper read at the meeting of the British Association by Mr. Sutton in that year. We allude to this matter for the reason that, with all objects of historical interest, correct dates are an important item. This form of camera, by the way, could now easily be used with the celluloid films instead of curved glass for the negatives; but we fear that the apparatus would be considered too cumbersome nowadays, particularly in face of the fact that modern lenses are to be had that will include on a flat plate nearly the same as Sutton's water lens does.

Big Telescopes.—There seems to be no end to the "beating the record" in the matter of large telescopes. When the Lick one was finished, it was thought at the time that it could not be beaten, but it has, and must now "take a back seat." Its object-glass is but thirty-six inches in diameter, while the Yerkes one, which has just been completed, rejoices in surface diameter of forty-one and a half inches, and weighs between 500 and 600 pounds. It has taken five years to make, and now the instrument has just been brought into use; but, up to the present, little has been published as to its performance. It will remain to be seen which of these two colossal instruments will accomplish most work. The latter should, but it is somewhat handicapped by locality. It is situated in the lake regions of the United Sates, while its elder, though smaller, brother is erected more than 4000 feet above sea level, in the clear air of California. Of course, photography is an important feature with both instruments, as, of course, it is with all large telescopes.

Scientific Kite-flying.—Upon this subject, which we have several times referred to of late, there is an interesting article in the *Century Magazine*, containing a summary of sufficient "working" character to enable any one intending to experiment with kite photography to make a fair start. Referring to the tailless forms, the article says there are two widely different ones in use, the Malay and the Hargreave or Cellular. The first-named, except for the improvement of shortening the distance from the cross-piece top, is identical with that used by the Japanese and Chinese for ages. It may be useful to quote what is written about the important point, the securing of the string to the kite loop or bridle. This is generally fastened to the kite at two points only, and this permits the planes on each side of the upright stick to move laterally with freedom; but the writer has obtained much better results with the same kite by fastening additional hangers at each end of the bow. The point on the bridle at which the string is tied determines the kite's angle of incidence. If the angle be too great—that is, if the point is too low on the bridle—the kite will not rise; if too small, it will dive.

Preserving our Art Collections.—We mentioned, last week, that Lord Stanhope, in the House of Lords, was to move an address to Her Majesty, praying that she would take such measures as were necessary to keep in the country such works of art, &c., as were of national historic interest. He has done so, and the motion has been negatived. There is no question that a considerable number of works of national interest do leave the country, and, as we said in our last issue, we do not see how it is to be avoided. The heavy death dues now payable have much to do with pictures leaving the country. Some have often to be sold to pay the dues, and they are bought by foreigners. The idea of the noble lords in favour of the motion is that the death duties on such works should be much less than they are at present.

By the way, while on the subject of works of art, it may be mentioned that some very high prices for paintings were realised at Christie's on Saturday last. A Turner's *Mercury* (landscape) fetched 7500 guineas, Phillips' *La Gloria* made 5000 guineas, a Landseer, representing sheep, dogs, and snow, was knocked down for 3000 guineas, and another work by the same artist for 2000 guineas.

South Kensington Museum.—The Select Committee of the House of Commons, appointed to inquire into and report upon the administration and cost of the Science and Art Department, have issued an urgent and emphatic report, as a preliminary one, calling attention to the danger that is hourly run of the destruction of the magnificent collection located there by fire. This has often been pointed out before, both in Parliament and in the press, but nothing has come of it, notwithstanding the large sums annually granted to that Department. The Committee direct attention to the fact that the buildings are of such a character as to almost court disaster, being, as they are, built for the most part of wood, lath and plaster, and covered with tarred felt, and also very old. In reply to a question in the House the other night, it was stated that the subject is engaging the serious attention of the Government. We hope it is, but the same answer has been given before and nothing done as a remedy. It is to be hoped that, with the issue of this preliminary and urgent report, the Committee will not lose sight of the object for which it was mainly appointed, namely, the administration and cost of the Department. For years past there have been complaints of the cost of it for what it does, and rumours of jobbery, &c.

What's in a Name?—In one of our contemporaries a point has been raised as to the application of the term "photo-aquatint" to two totally distinct and different processes. Mr. Maskell has applied it to the old bichromated gum-carbon process, and Mr. Huson to the photogravure process of Klic, the etching method. It is certainly a novelty to apply the term "photo-aquatint" to the carbon process of Pouncy of 1859, particularly as "aquatint" has been known for more than a century as a method of engraving on copper plates, to be printed from in the copper-plate press in the same way as the modern photogravures are printed.

In an article on p. 547 of our volume for 1892, we pointed out the analogy of the etching method of photogravure to aquatint engraving. In the latter a copper plate is dusted over with powdered resin or bitumen, and heated in the same way as for photogravure. Then the artist paints in the high lights with an acid resistant varnish, and then treats the plate with dilute acid. Then, after washing and drying, the delicate portions are painted in and the plate again etched. These operations are repeated again and again till the deepest shadows are reached. From this it will be seen that photogravure as practised is, except that it is, so to speak, worked automatically, similar to aquatint, the varying thicknesses of the gelatine resist taking the place of the several applications of the resistant varnish. In this case the term "photo-aquatint" is not only applicable, but it is at the same time descriptive. This is certainly not the case when it is applied to Pouncy's carbon process with bichromated gum.

Apropos of photogravure, Mr. Huson proposes to get over "devils" (who is sponsor for the name?) by coating the copper plate with an insoluble layer of gelatine, after it has been grounded, so as to form a substratum for the gelatine picture, as is done with carbon transparencies on glass. If the devils are due to the cause Mr. Huson suggests, this treatment should get over the trouble.

Important Improvement in X-ray Tubes.—Mr. A. A. C. Swinton has communicated to the columns of *Nature* details of what appear to be the most important improvement in tubes for Röntgen work yet devised, not second perhaps to the introduction of the Jackson focus tube in lieu of the original pear shape. The "essential feature consists in mounting the cathode on a sliding support, so that it can be moved axially to a small extent in and out of a tubular neck blown on one end of a glass bulb. When arranged in this manner, the exact position of the cathode is found to have an enormous influence upon the penetrative value of the X rays produced. With a suitable and constant degree of exhaustion, if the cathode is placed" in a certain way, as shown in his drawing, "X rays of very high penetrative value are produced, while the small movement of about ·3 inch . . . . will suffice to reduce the penetrative value of the rays almost to nothing. Between these two extremes every grade of penetrative value is readily obtained by simply altering the position of the cathode between the limits of its travel. If the tube be used in a horizontal position, this can easily be done by merely tapping it at one end or the other without removing it from its support."

He has made a further important improvement in construction to obviate the well-known heating effect which usually necessitates arresting the flow of current for a while to avoid rupture of the

tube. He "finds it convenient to mount the ordinary small disc of platinum upon a considerably larger and thicker disc of aluminium, say, about one inch in diameter and ·25 inch in thickness, the platinum being tightly wedged and riveted in a shallow depression turned out of one face of the aluminium disc. Owing to the considerable radiating surface of the aluminium and its considerable mass, this arrangement prevents the platinum from attaining an excessive temperature . . . . the tubes do not blacken so quickly.'

DIGRESSIONS.

No. XVIII.—Strike while the Iron is Hot.

No good photographer reads at this delightful time of year; so, casting about for a subject, and thinking anything would do for this month's essay, I began to endeavour to resuscitate some forgotten bit of lore connected with our art; but I found I had not reckoned with myself, and I could no more go into a musty old subject while "spring unlocks the flowers to paint the laughing soil," and slowly changes the season into the pageantry of summer, than my readers would patiently endure such dry-as-dust matter at this time of year.

I don't know any greater compulsory power to force me from my desk than a fine spring morning. I sit down to work, resent the prompting for an hour, but it is not to be permanently resisted. Therefore, picking up a hand camera, I go. I "follow the gleam," my destination three or four miles anywhere. Comparatively late in the year as it is, this is my first morning with a camera. A trial plate yesterday showed that the exposures were much slower than I had left them last autumn—another spring difficulty seen at once, and temporarily provided for—but it would have persuaded some amateurs, who eagerly seize an opportunity for acquiring a new bit of apparatus, to go in for something like that wonderful machine for measuring the speed of shutters, consisting chiefly of a grandfather clock, I saw described a few years ago at the Camera Club, with edification. Then I may be asked, How shall I make the necessary corrections without some such apparatus? Why, send the camera to the maker for a day or two.

On my way, I came to an old, disused quarry, out of which I dug, years ago, many pictures. Kind nature has passed her picturesque hand over it, and the old scenes now present many quite new pictures. The growth of a quarter of a century of wild nature has created a transformation scene, and a new order of beauty has arisen. The chief feature of the old landscape was the sandstone rocks; now the predominant effect is caused by the delicate grey green of the downy catkins of the sallow, which had overgrown the place and are unusually fine and plentiful this year. They supply the palm-boughs of Easter, so usually seen in Kentish villages at that season.

Here was a new feature in landscape right before me. I had only a hand camera with me, and no models, but the wind was as still as it seldom is in this breezy part of the world. I therefore did my best with what I had, which, I may remark, is seldom so good, except by accident, as when thoughtful provision, guided by knowledge, is made for complete pictorial effect. I exposed my dozen, and—but here is a delightful digression, my own affairs must keep.

Coming down the distant path, into the quarry, is a Paterfamilias with a camera, and his son and daughter, also with cameras, and all the cameras with legs. I dissembled; for, without being too inquisitive, and greatly disliking being overlooked myself, I dearly like to watch the operations of others.

The battery of three cameras was set up on a clear space, and I had found what may be called a front seat in an obscure corner. The Pater's camera was of dark Spanish mahogany, $7\frac{1}{4} \times 4\frac{1}{2}$, those used by the son and daughter quarter-plates, in lighter wood, from which the dullest observer would infer that the Pater was an old wet-plate man, and that the children were in the "guinea-set" stage. You could see from a distance that the dark camera was a Meagher or a Hare, date about 1868. It would probably be easy to get much of the character of a man from a study of his camera, but possibly tedious; and I would not recommend the reader to buy an old camera so as to give himself the appearance of age and wisdom; other indications have to be taken into consideration.

The characteristic bits were skilfully chosen, and a good deal of focussing and levelling done, when a man with a picturesque horse and cart came along and rested at an adjacent spot. The man left the horse and cart while he went to his dinner at a cottage near by. This was too much for the photographers. They left the selected views, which ought to have been exposed and done with by this time, and rushed at the horse and cart, which, with the surroundings, made a very capital subject. Then, again, came all that indecision and infirmity of purpose which is the bane of much amateur photography, and from which experience is not exempt. In many photographers there seems to be a total inability to see the subject in nature, and a difficulty in making the best of it by any means. Here was an excellent subject that may be lost at any minute, yet not even the experienced Pater could go simply up to the right place, set up his camera, and expose the plate without more ado. First of all, view meters were in request, then cameras were planted, heads put under focussing cloths; doubt reigned under the dark cloth, and then occurred a dance of three camera dervishes, as the altered minds caused frequent changes of points of view. Then the changes of site died away, breaking out again occasionally. I could see the horse had been photographed before, and was enjoying the fun; his was the harvest of a quiet eye—with a twinkle in it. Then came the final focussing, and there was a good deal of it, the trial of different lenses by the Pater, and much discussion, and visiting of each of others' cameras, and learned talks of *f*'s and actinometers, with a lesson on the latter, which seemed new to the children—another of their troubles come upon them. Presently, before an exposure was made, came a whistle down the road, the horse pricked up his ears, turned slowly round, and lumbered up the road to join his master. Thus there was no result to so much care, for the simple reason that there was too much of it. A little more knowledge of what would make a picture, and the result of knowledge, decision, would have secured pictures.

Many things are usually done in taking a picture that had better be left undone. I am never able to understand why a photographer must look at the focussing glass so much. If he knows his tools and his art, it is quite unnecessary. If he knows how much his lens will take in, he ought to be able to give a shrewd guess how far off he should plant his camera. The wise photographer does not complicate himself with more than one, or at most two lenses, and he ought to know what they will do precisely. Some add a monochrome glass to their encumbrances, to enable them to see the light and shade of nature only, free from the distraction of colour, and very many feel obliged to consult the ground glass for every little detail of composition, and few are able to judge the exposure except under the cloth, the very worst place, one would have thought, to look for a uniform amount of light, as the pupil of the eye is constantly changing as it goes from the brilliant outside light to the dark. Proper training would have taught them to much more easily see the composition in nature. A rapid glance under the dark cloth should enable the photographer to finally focus, and see that all is well, then no time should be lost. Much invaluable time is often thrown away on the adjustment of complicated shutters and actinometers. The *spirit* of a scene is better than machinery.

Now I may perhaps return to my own exposed plates. I had exposed a dozen quarter-plates, and the result was that I had at least eight subjects for pictures, but decided that every one would be better for a figure or figures. It is a fixed opinion with me that it is almost a crime to exhibit a picture that shows possibility of improvement, and, thinking of the old saying, "If things were to be done twice, all would be well," determined to make an expedition to the quarry, in a day or two, with models and whole-plates.

Perhaps some photographers may remember the last fortnight in April; the light was various but good, and the wind sufficiently free from violence to tempt you out, but quite teasing enough to spoil your work when you attempted anything movable. I got two or three good subjects, but one on which I had fixed my hopes and had exposed three plates had everything I could desire in the figures, and I desire something better than the accidental blurs or petrified curiosities often recommended as the only figures allowable—but moved in the trees and sallow undergrowth, and it was

one of my objects to use the catkins as part of the subject. During the next fortnight two other expeditions were undertaken to secure a perfect negative of the one picture, and all the negatives were damaged by wind. The next time I visited the quarry the leaves had outgrown the catkins and the effect was gone. The finished picture, if it is finished at all, will be produced from the first plate exposed, but I shall not be without the consolation that I tried to do better. I may console myself further by remembering, as we are sometimes taught, that a little movement is really a great improvement to the background.

Failure in the young is experience, part of the unpleasant discipline that brings knowledge, and not defeat; to the old failure brings no compensations. I wonder if I had not better persuade myself, for this occasion only, that a little movement in the background is an advantage? H. P. Robinson.

DEVELOPMENT OF PRINTING-OUT PAPER.

Slightly exposed prints on gelatino-chloride of silver, collodio-chloride, or albumenised paper, may be developed to full strength with gallic acid. This kind of development is called "physical," in contradistinction to the "chemical" development of bromide paper and dry plates.

In 1892 Valenta drew attention to the fact that some other developers besides gallic acid could be used for the purpose. As the method seems to be coming more into use, I have made an examination of the behaviour of these substances.

The varying substances, such as hydroquinone, pyrogallol, and para-amido-phenol, act with much greater dissimilarity in physical than in chemical development. According to the method of treatment of the prints with one or other of these developers, or according to other ingredients added, different tones, different shadows, and different gradations are attainable.

We will first make a few prefatory generalisations concerning the properties of the various substances.

Nearly all of them will develop printing-out paper if dissolved in water only; but, whilst gallic acid and hydroquinone may be used in concentrated solution, pyrogallol, eikonogen, and glycin, in strong solutions, act far too rapidly for general use. They must either be diluted very considerably, or their action must be restrained by addition of acid. Mixtures of pyrogallol and citric acid have been repeatedly recommended. Although development proceeds normally, I strongly deprecate the use of very acid solutions, as they are very liable to produce sulphur toning. For this reason I prefer "weak developers," preferably hydroquinone or gallic acid, to the others. These two may even be used with a weak alkali. Thus gallic acid is nearly always used with acetate of soda, especially the fused. But this cannot be termed an alkaline developer. It must be remembered that printing-out papers usually contain a considerable amount of organic acid, which enters the bath. A really alkaline developer would immediately blacken the paper uniformly.

The less acid the developer, the greater is the depth acquired by the shadows.

The more acid the developer, the redder the tone becomes in fixing.

The redder a print is developed, the greater is the loss of intensity in fixing.

According to the developer selected, the same print will yield the most varied tones by simple fixation without toning with gold. They may range from green-black to olive, brown, dark red, and even to the pale yellow of a printed picture treated with hyposulphite of soda only.

The latter, especially, cannot be used without further treatment, and must be toned with gold, preferably in a combined toning and fixing bath. In this the picture tones as readily as an ordinary print. The other colours may be used without further treatment with a gold bath. The green pictures may be toned with gold, but will not give the usual violet "photographic tone." If we form a clear conception of the toning process, the difference in behaviour is readily understood. In the treatment with chloride of gold, a film of metallic gold is deposited upon each particle. From its thinness the film is blue. The red of the silver is transmitted more or less through the blue gold, and thus the red-brown to violet tones are produced, to which we are accustomed in the ordinary process. If we attempt to deposit gold on a bromide print, it will not "tone," and the same is almost as impossible with the green developed image on gelatino-chloride paper.

It is therefore necessary to discriminate between two principal processes:—

First.—Development followed by simple fixation.

Second.—Development followed by toning. Pictures treated in this way behave similarly to those that are printed out.

The following experiments were made with a species of gelatino-chloride paper (Liesegang's Aristo). For our purpose, the results are applicable to other kinds of emulsion paper, if allowance be made for differences in excess of silver nitrate and acid. The more free silver present, the greater is the depth of picture. The larger the amount of acid in the paper, the less is required in the developer. Strips of paper were exposed for equal length of time under a photometer made of tissue paper, and then immersed in the different developers, with following results:—

Gallic Acid.—A saturated solution was made with cold water. The prints were developed with it in less than two minutes. After fixing, they were green in tone, with almost black shadows. Gallic acid inclines especially to the production of green tones, and the chief point is that the print shall remain long enough in the developer. The picture must consequently be only slightly printed, and, to avoid flatness, the negative must be somewhat vigorous. From flat negatives green prints cannot be obtained, because they cannot be kept long enough in the developer. If a strip of paper is allowed to remain for a minute only in the developer, a fine brown tone is obtained after fixing; even the weak half-tones are not yellow. This is a perfect substitute for gold toning, and I have no doubt will supersede it in time. To obtain this tone with hard negatives, it is only necessary to expose rather longer, for instance, to half print them.

Gallic acid is usually employed with fused or crystallised acetate of soda. This addition tends to accelerate development. The tone is approximately the same as with plain gallic acid. The solution deteriorates more quickly, and a black precipitate of metallic silver is formed; but, by the addition of gum arabic, or fish glue, this decomposition may be considerably retarded. The addition of strong alkalies is quite unsuitable. The bath must be considerably diluted to permit of the addition of a small quantity of carbonate of soda. Phosphate of soda acts like the stronger alkalies.

Salts of lead have very often been used in conjunction with gallic acid. Dr. Van Monckhoven recommended a solution of gallic acid and acetate of lead for his nitro-glucose paper (see Dr. P. E. Liesegang's *Silberdruck*). Lebiedzinsky, in 1890, also gave the following formula for celloidine paper:—

Water	1 litre.
Gallic acid	4 grammes.
Acetate of soda	20 ,,
Nitrate of lead	2 ,,
Citric acid	6 ,,

I have tried the addition of acetate of lead to pure gallic acid, and a heavy white precipitate of gallate of lead was thrown down. A portion of the gallic acid, was, of course, rendered inactive, and the solution worked much slower. I did not find any improvement in the tone. It was formerly thought that the salts of lead conduced to sulphur toning with the combined bath. I have not been able to prove that the small traces brought by the prints into the fixing bath have this effect. There are no considerations that recommend the use of lead salts with the gallic-acid developer.

Gallic acid also develops in presence of citric and tartaric acids. The bath remains clear for a longer time, and works much slower. The tone of the picture is somewhat red, and loses much strength in the fixing bath. Sulphur toning usually occurs if the prints are not thoroughly washed between development and fixation. Sulphite of soda has a decided restraining action, but the pictures do not tend to hardness as with acids, and are softer with larger additions of sulphite to the solution. The tone is red-brown. I have not been able to obtain green tones. An addition of acetate of soda to the bath increases the softness of the picture.

I recommend a bath of—

Concentrated gallic acid solution	20 c. c.
Acetate of soda	1 gramme.
Fish glue	3 c. c.
Water	20 ,,

Hydroquinone, of all developers, offers the strongest contrast to gallic acid. Whilst the latter has a distinctly independent toning action, without recourse to a subsequent toning bath, this is scarcely possible with hydroquinone. Consequently the pictures cannot be simply fixed, and must be treated with a combined bath. It may be used, dissolved in water only, or with addition of citric or acetic acid. Paper developed

with plain or acid hydroquinone does not differ from an ordinary print when immersed in the fixing bath. It loses much of its intensity, and turns reddish-yellow. Acetate of soda, again, accelerates the action, and the colour is somewhat browner. This may be increased by a small addition of phosphate of soda, but a slight excess at once blackens the entire film.

Pyrogallol.—For development with water, this can only be used in very weak solution. The colour is a fine brown to warm black in the deep shadows, and, as with gallic acid, the colours produced do not require any further toning. For these brown tones I consider pyrogallol more suitable than gallic acid. Green is also producible, but gallic acid is far superior for the purpose. A more concentrated solution is necessary, and the developer is then too energetic.

Citric or tartaric acid retards development, but I prefer to use a very dilute solution of plain pyrogallol, as the acid increases the risk of sulphur toning, and the completion of development cannot be easily estimated owing to the great loss in the fixing bath. Dr. van Monckhoven recommended for his nitro-glucose paper a solution consisting of—

Water	2 litres.
Pyrogallol	1 gramme.
Citric acid	10 grammes.

Cronenberg has used a similar bath for Aristo paper.

Very weak alkalies bring about an immediate discolouration of the entire film, and the same is the case with addition of sulphite of soda. It must be remembered that such a solution of pyrogallol will develop a dry plate (chemically). Moreover, the commercial sulphite is nearly always rather alkaline. A normally active developer is obtained by mixing pyrogallol with both sulphite of soda and a considerable quantity of citric acid, but the tone is much inferior to that produced by plain pyrogallol. Valenta has chiefly used such a solution, but it should be observed that he supplements it with a combined toning and fixing bath. His formula is as follows:—

Water	1 litre.
Sulphite of soda	100 grammes.
Pyrogallol	10 ,,
Citric acid	11 ,,

Valenta remarks: "The developer is clean and rapid for the various kinds of paper. It is but slightly discoloured after much use, and will keep for some time, even after use. The citric acid acts as a restrainer and keeps the picture clear. In most cases development is complete in a few minutes, and after washing in water the pictures acquire a warm, pleasant tone, ranging from brownish-red to purple-black, by use of the combined toning and fixing bath."

Para-amidophenol (the pure salt, not acidified with hydrochloric acid).—This acts almost in the same way as pyrogallol. In a weak aqueous solution it is quite as suitable for the production of brown tones. If mixed with sulphite of soda (and likewise with citric acid in addition), as Valenta and Haneke have done, red tones are produced that necessitate the use of a combined toning and fixing bath. Haneke's formula is the following:—

Water	1 litre.
Sulphite of soda	50 grammes.
Para-amidophenol (acidified with hydrochloric acid)	7 ,,
Citric acid	8 ,,

Ortho-amidophenol.—This behaves in the same manner as para-amidophenol with reference to tone. Apart from the nascent silver, the solution soon assumes a yellow colour, and easily stains the back of the paper yellow, especially in the presence of acetate of soda.

Metol.—This is a very pleasing developer. Greenish and brown tones are both obtainable with it. Very weak aqueous solutions must be used. The precipitate formed is lilac in colour, and does not agglomerate, like that produced with a gallic acid or pyrogallol developer. The addition of sulphite of soda produces an immediate discolouration of the entire film. If much tartaric acid is added, the picture slowly develops yellowish red. It is, moreover, remarkable that long immersion in the fixing bath produces strong sulphur toning (with precipitation of sulphur), notwithstanding the presence of the sulphite.

Pyrocatechin.—This acts like hydroquinone with regard to tone, and the combined toning and fixing bath must always follow. Compared with hydroquinone, it has the disadvantage of producing a yellow (leather-coloured) precipitate, which easily stains the front and back of the picture rather yellow.

Amidol, eikonogen, glycin, phenyl-hydrazine, and amidocoll (*i.e.*, p-amido-phenylglycin of Lucius C. Brüning) are much too energetic in plain aqueous solution. A quantity of tartaric acid must be added to restrain their action. Considerations of sulphur toning render these developers unavailable. I may add, that not only for permanency should sulphur toning be avoided, but a very important factor for consideration also is the change in colour of the print.

Tannin.—This also is useless. It develops after the manner of hydroquinone, but easily stains the back of the paper yellow. Moreover, it spoils the combined toning and fixing bath. If, for example, weak alkaline tannin is added to a solution of hyposulphite of soda, a flocculent substance is precipitated.

Sulphate of Iron.—Used almost exclusively for a long time in the development of wet-collodion negatives. This is useless for our purpose, as it stains the front and back of the paper orange, and the discolouration cannot be avoided by addition of restrainers, such as citric acid, sulphite of soda, fish glue, or other admixture.

Consequently, for practical purposes, only gallic acid, hydroquinone, pyrogallol, para-amidophenol, and metol are of importance.

R. Ed. Liesegang.

THE INTENSIFICATION OF PLATINUM PRINTS.

Probably but few workers in platinum are strangers to prints lacking, when developed, the very little additional depth necessary for vigorous and satisfactory productions. The detail in such prints is readily discernible, differing in this respect from those so seriously under-exposed as to leave the high lights simply patches of white paper. But, although in these slightly under-timed prints there is almost perfect gradation, the lack of force ultimately causes their rejection, despite the usual hope that "they may dry up dark enough." It is more especially during the winter months that these anæmic prints occur, and where exposure is judged solely by the aid of an actinometer the percentage of such prints is apt to be unpleasantly great. But, though the intensification of such prints rescues them from destruction on account of inferiority, the fact remains that morally an objection would always be felt to distributing such prints as *bonâ-fide* platinum prints. Where the prints, after intensification, are to remain in the hands of the producer, or are sent out without any commercial obligation, the matter is, of course, very different, and in such instances a reliable means of strengthening weak prints cannot be other than a boon to many producers, more especially to those to whom the cost of platinum printing is a consideration.

Several formulæ for effecting this intensification have appeared in the photographic papers, the most promising being one suggested (to the best of my recollection) by Dr. Vogel, and consisting of silver intensification. This certainly strengthened the print, but in doing so the solution precipitated and discoloured to such an extent and so rapidly that, by the time the print was sufficiently intensified, it was hopelessly ruined by staining; at least, such was my experience. Later on, having intensified some lantern slides very successfully with metol-silver, it occurred to me to apply the same to platinum prints, and the result was a considerable measure of success, the whites remained perfectly pure, and the solution did not precipitate during a rather lengthy application. The resulting colour, however, was not the rich, velvety black of a good platinum print, and a great fault was the fact that, on immersion in hyposulphite, the silver deposited on the platinum image was gradually removed, so that, unless the intensification had been very considerably in excess of what was required, the great safeguard of a hypo bath could not be applied. The grey-black colour given by metol and silver seemed an insuperable objection, so the metol was replaced by hydroquinone, and a much richer black obtained; but the difficulty remained that, in passing the prints after intensification through a hypo bath, they were reduced very rapidly, and, if left in long enough, the silver image was entirely removed. Some prints over-intensified at this period with silver and hydroquinone, and immersed in a ten per cent. hypo solution until the right depth was reached, are still unchanged after an exposure of some months to a strong light.

But the process had yet an element of great uncertainty in it, that was only removed when toning the prints after intensification suggested itself. This entirely obviated the reduction of the image in the fixing bath, however long it remained there, so that, having been well fixed, every confidence might be felt in the prints' ultimate permanence. The toning solution tried in the first instance was a sulphocyanide bath, similar in construction to those recommended for printing-out papers, and it was very effective in all but the colour it gave, which was a bluish-black, whereas the object in view was to obtain an intensified print

practically indistinguishable from one fully printed and developed. Eventually toning with platinum after intensification was found to give results satisfactory both in colour and permanence. The colour was practically that of a developed print, and even a lengthy immersion in hypo failed to effect the reduction so noticeable in a print intensified but fixed without toning, while the permanence, so far as it is possible to judge at present, seems perfect.

The prints suitable for intensification are, as previously stated, those just lacking the vigour essential to a good print; very much under-exposed prints are useless, and it is waste of time and material to attempt making them passable. The prints selected for intensification are thoroughly soaked in a dish of distilled water, and then redeveloped in a clean porcelain (by preference) tray with equal parts of the following solutions:—

A.	Hydroquinone	120 grains.
	Citric acid	180 ,,
	Distilled water	20 ounces.
B.	Silver nitrate	80 grains.
	Nitric acid	40 minims.
	Distilled water	20 ounces.

The intensification is gradual, and the solution remains colourless and unprecipitated throughout the operation. Several prints may be intensified at once, provided sufficient solution is used and the dish carefully rocked to prevent them sticking together. A few changes of water, following intensification, prepares them for the toning bath, which is—

Citric acid	30 grains.
Sodium chloride	30 ,,
Water	30 ounces.

To which add one grain of potassium chloro-platinite. Although this formula is given for the sake of completeness, there is no reason why any platinum-toning formula should not be equally applicable. No change whatever occurs in the appearance of the print during toning, so the length of its immersion only can be taken as a guide, and a period of fifteen minutes seems a sufficient time to give the necessary stability to the print. After again washing in several changes of water, the prints are fixed for ten or fifteen minutes in a ten per cent. solution of hypo-sulphite, and finally washed and dried.

One point to be observed has purposely been left until the end, in order that greater stress may be laid upon it; it is the necessity, if clean, unstained prints are to result, of using a very subdued light during intensification, gaslight or the yellow fabric used in the sensitising room answering best. If the process is conducted in anything like an actinic light, stains and irregularities are sure to be unbidden guests, and the silver solution is discoloured long before the requisite vigour is obtained.

An alternative formula for the intensifier is given which answers equally well, and is rather more convenient. The silver solution is made up as for collodion work, and kept in a dropping bottle, viz.—

Silver nitrate	60 grains,
Nitric acid	30 minims,
Citric acid	30 grains,
Water	2 ounces,

ten or fifteen minims of this stock solution to a freshly made solution of hydroquinone, three grains to the ounce, giving results identical with those of the previous solutions.

The process of strengthening platinum prints as here given may seem very complicated, and it may be urged that less time would be consumed in printing another copy. In practice, however, after the first few trials the operations are simple enough, and the time necessary to intensify several prints is really very little, the various steps being quickly accomplished, and none of them entailing very much washing. In instances where it is most desirable to make the best of a certain print, or where local intensification would be an improvement, the process, from its certainty and efficiency, is really useful. GEORGE T. HARRIS.

PHOTOGRAPHIC WORKERS AT WORK.

XIV.—THE SANDELL WORKS COMPANY AT SOUTH NORWOOD.

WHILE the Sandell Exhibition was open we had the opportunity of inspecting the Company's dry-plate works, which, as our readers are aware, are situated at Selhurst-road, South Norwood. Two large houses have been adapted for the purpose, and, when it is said that something like fifty rooms are available for the different branches of manufacture, it will be apparent that the Company are possessed of ample facilities in the way of space.

The Sandell Works Company's premises are delightfully situated, almost on the verge of open country and out of range of the London smoke. From the top of the buildings extensive and beautiful views of Kent, Surrey, and Sussex are to be had. A studio and printing rooms are situated in this part of the premises, where also are developing and plate-testing rooms. For work of this nature the accommodation available is sufficient to cause envy in the breast of the town photographer.

The emulsion-making rooms are situated in the lower part of the building. The motive and illuminating power used throughout the factory is electricity supplied by a dynamo on the premises, and it is electricity that drives the revolving emulsion washer, the arms of which keep in constant agitation a large batch of emulsion which in the shredded state is undergoing washing. The mass is placed in a huge earthenware vessel capable of holding many gallons, and, when the operation is complete, it is withdrawn by means of a large finely meshed net, in which it is contained. Washing usually takes six hours, the temperature of the water being kept at a uniform point. In the same room the melting up of the emulsion is performed, gas supplying the requisite degree of heat. In an adjoining cool and dark apartment there are rows of shelves on which a number of jars are standing. These contain washed emulsion in the solidified form and the contents of which are dissolved up for coating as may be required.

With a brief inspection of the glass-cleaning, packing, and other rooms, we make our way, under the careful guidance of Mr. Sandell, to the room which is devoted to the examination of the plates and films, and the cutting of those that are passed. The cutting is done by an ingenious machine, which was not in operation at the time of our visit. As regards the light in which the plates are handled, it struck us as being exceedingly safe, indeed so deep is the red illuminant employed in the rooms devoted to the preparation and handling of the plates that it took us far longer to get accustomed to it than we have found necessary in other dry-plate works.

But the extra precaution here taken in this respect is not without its advantages, as it enables the light to be safely used much nearer the plates than would be the case were it of greater power. In passing from room to room, the opening or closing of a door sets an electric bell in action—obviously another wise provision in a dry-plate factory. We find ourselves at last in the coating room. The proper system to be employed in multiple coating was, we learn, not hit upon until after considerable experience had been obtained. If the first coating of emulsion were "bone dry," the successful addition of a second coating was out of the question; on the other hand, it was easy to fail under the opposite conditions. In practice, therefore, it has been found that the first coating is best in a condition to receive the second layer of emulsion while it has stopped perceptibly short of actual dryness.

Some points of novelty characterise the coating machine, one of Continental manufacture. The light from a red lamp placed immediately under the actual coater is, by means of a mirror, reflected up to the glass bed of the machine, and thus, as the plate travels forward, it can be seen the moment it has been covered with emulsion. The precise operation of coating is as follows: the supply of liquid from the jar having been adjusted, it issues in a thin stream from a species of mouth, the exact width of the plate. As the latter travels, it may be said to coat itself by drawing the emulsion evenly over its surface. The action, it will be observed, is not a scraping one. The plates, passing over water, are set by the time they reach the end of the machine, where they are stacked in racks and passed into the drying room, which has a capacity of 1800 dozen whole plates. We can testify that a most regular and even coating is given to the plates by the particular machine employed.

The factory of the Sandell Works Company is a model of neatness and good order. We are perhaps not betraying a secret in mentioning the circumstance that Mrs. Sandell, the wife of the esteemed managing director of the Company, renders valuable and enthusiastic assistance in the preparation of the Sandell plates. For the latter the best English glass is used, and the users of the plates have the satisfaction of knowing that an almost ideal care is taken in their manufacture, and that the supervision is of a direct and most responsible kind.

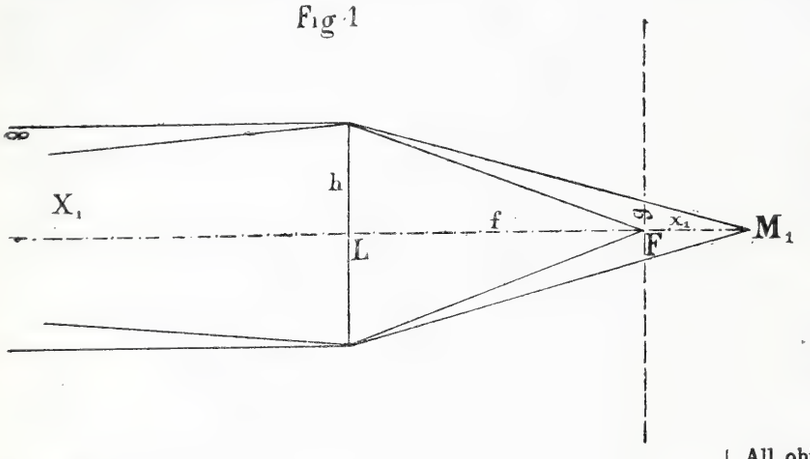
THE FOCUSSING OF HAND CAMERAS.

[Translated from the Photographisches Correspondenz.]

IF the photographic camera is focussed for very distant objects, so that their distance may be regarded as infinite, and the ground glass and picture plane coincide with the focus, it is known that other nearer points in the field are also distinctly rendered on the screen, and the smaller the lens and the more it is stopped down, or, in other words, the

greater its depth, the nearer may those points be situate. Let a definite amount of diffusion be taken as minimal definition. For instance, we will say $\frac{1}{10}$ mm. is the diameter of the circular area of the representation of a point, that may be still considered sharp. The minimal distance of an object from the camera may then be exactly determined, so that it shall appear with minimal definition in the picture. The depth of field extends from this minimum distance to infinity.

Fig. 1



In figure 1 let h be the aperture of the lens, f the focus, g the permissible diffusion, x_1 the depth of focus (F.M$_1$).

Then—1. $x_1 = f \frac{g}{(h-g)}$.

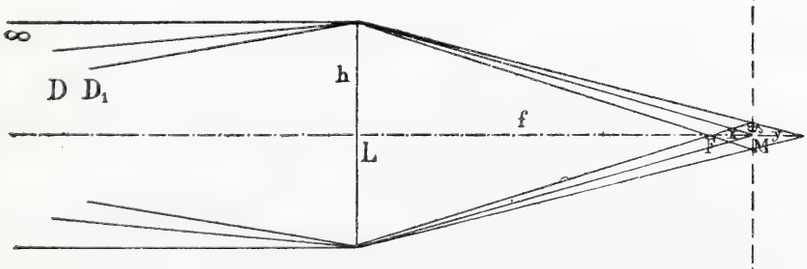
Take for example a lens with focus $f=120$ mm., aperture $h=12$ mm., therefore of $\frac{1}{10}$ proportional intensity or aperture, and minimal definition $g=\frac{1}{10}$ mm., then the depth of focus $x_1=1{\cdot}01$mm. The distance of x_1, the nearest object rendered with sufficient definition, may be determined from x_1 by means of the Newtonian formula.

2. $(x_1-f)\ x_1=f^2$; $x_1=f\frac{h}{g}$, which gives with the same example, lens 1 : 10f=12 cm. and $\frac{1}{10}$ mm. definition, $x_1=14{\cdot}4$ m. We say that the camera is in focus for everything beyond 14 m.

But, by thus focussing at the principal focus, we only utilise about one half of the depth, and lose the other half.

If we increase the extension by x, a definite amount yet to be determined, so that, conversely, an object at infinite distance shall be rendered with minimal definition, whilst a nearer point at definite distance is focussed with maximum definition at M (fig. 2), then the focus, F, still falls within the depth of picture, and the extra extension is determinable by—

Fig. 2



3. $x=f\cdot\frac{g}{h}$, and for lens 1 : 10 f=120 mm., definition $\frac{1}{10}$, x=1 mm.

The distance, D, of the object in sharpest focus can be ascertained from the value of x by again using the Newtonian formula.

4. $(D-f)\ x=f^2$; $D=f\cdot\frac{(h+g)}{g}$, whence, by arithmetic for the example we have taken, D=14·52 m.

The freedom we have used in focussing objects at infinite distance, by the amount of camera extension, x, now gives us a depth of picture, x, in front of our sharpest image, M, and we utilise a depth, y, beyond M, for our picture. The greatest sharpness for this lies between M and N, and the corresponding objects lie nearer than D. This further depth, M N=y, follows from the equation :

5. $g : y = h : (f+x+y)$, and is the value $y=f\cdot\frac{g}{h}\frac{(h+g)}{(h-g)}$ (1·02 mm. for our example).

The sum of the anterior and posterior depth gives us the total depth of the picture :

6. $x+y=f\frac{2g}{h-g}$, (example 2·02 mm.).

The distance from the optical centre of the lens, of the nearest object that is sufficiently sharp, when we focus at M, is determined by—

7. $D_1=f\frac{(h+g)}{2g}$, which is deduced analogously to the determination of the distances, x_1 and D (equations 2 and 4), from the Newtonian formula now expressed as $(D_1-f)\ (x+y)=f^2$.

The value found for D_1 exhibits the remarkable fact—

8. $D_1=\frac{1}{2}D$;

that is to say—

If the sharpest focus is regulated for objects at such definite distance that those at infinite distance appear sharp, then objects at only half the definite distance will also appear sharp.

Under these circumstances, for the example selected the camera is in focus from 7·26 m. to infinity (according to 7, or 4 and 8). All objects from infinity to 7 26 m. appear with definition of at least $\frac{1}{10}$ mm.

In comparison with focussing for infinity we have gained considerably in depth, or, as measured by our example, 1·02 mm. in the image, and 7·26 m. in depth of field. This method of focussing hand cameras for distance, D, is therefore unquestionably preferable, especially for those "with fixed focus." It should also be remembered that very distant objects are intercepted by an enormous amount of atmosphere that is seldom sufficiently clear and still to leave definition unaffected, consequently focussing for infinity does not in fact utilise for any distance the full perfection of definition that the less possesses.

The recommendation to focus for objects at definite distance is not new, but where do we see it followed? (Existing tables, it is true, give the distance we have called x_1, and not distance, D; but their difference is only theoretically not practically important. D is one focus more than x_1; $D=x_1+f$.)

In working with stand cameras with rackwork movement and lens stationary, the adjustment is made by bringing the ground glass nearer to the picture until very distant objects acquire sufficient (minimal) definition (the constant h). Or, similarly, if we focus with greatest sharpness an object placed nearer, and then stop down (h alternate) until objects at infinite distance are rendered with satisfactory definition.

The nearest object rendered with similar sharpness to those infinitely distant is, in this case, at just half the distance of the former.

MAX LOEHR.

STRIPPING P.O.P. PRINTS.

SOME time ago I described in your columns a method of stripping paper prints for transfer and other purposes ; I now supplement that article with another application of the method. A print transferred to glass, as described in the former article, will provide a transparency for the purpose of making an enlarged negative which shall show *any* degree of modification in its character. A weak, and, as it stands, a useless, negative can be reproduced or an enlargement made so as to allow of its being printed by *any* process, and make it hard to believe it is the offspring of its sickly original; such is the change. In a very bad case the best print possible is obtained from the original negative, fixed without toning, and transferred to glass. You may now make another print from this, which will, of course, be a negative, and will show much more contrast than its parent, the positive transparency. This also may be fixed without toning, transferred to glass, another print taken and transferred, and this latter finally copied or enlarged on to a slow plate, say an Ilford process plate. You will scarcely believe your own eyes. The modification can be carried to any extent by *not* toning or toning the intermediate prints. If the power given is not large enough, you may get aniline transparent colours to match the colour of the print that has been transferred to glass, and with a brush *plus good taste* put in shadows and detail to your own satisfaction.

All this supposing the subject of the original be worth the trouble.

Not that the latter is heart-breaking. On the other hand, it is so easy, that some may be tempted to reproduce negatives that were better scraped off and thrown into the residue tub.

Before closing I should like to say that the special preparation referred to in my former article is called "antifondre," not "antifoudre" as printed. I only mention it lest etymologists should think me "cracked."

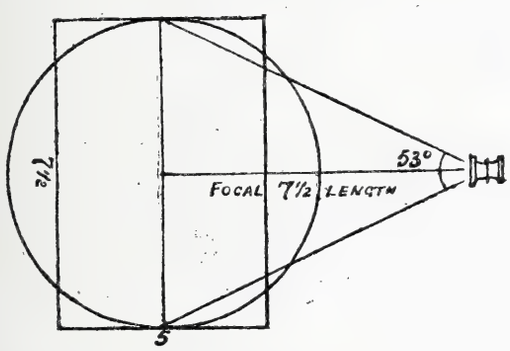
Jubbulpore, E. I., May 5, 1897. H. HANDS.

VIEW-ANGLES.

AN esteemed correspondent, Mr. M. J. Michael, writes us as follows :—

"I take this opportunity of drawing your attention to the 'Table of View-angles,' on page 1015 of this year's ALMANAC. If used as there directed, it leads to results inaccurate and misleading; inaccurate, since the angle included on a plate should be measured along the diagonal, and not along the base, of the plate; and the information is misleading, since it leads to the supposition that a lens having the angle which is given by using the table, as there directed, will cover the plate mentioned. Hence all the examples given at the foot of the table specify lenses that, if used on the given plates, must leave at least two, and if the lens is placed centrally all the four, corners uncovered. If the corners of a plate are to be covered, the angle embraced by the lens must be sufficient to cover the diagonal of the plate; in other words, the circle of illumination given by the lens must have a diameter equal to the diagonal of the plate, and not only equal to the length of the base of the plate.

"A simple figure makes this evident. If the focal length of the lens, *e.g.*, seven and a half inches on a $7\frac{1}{2} \times 5$ plate, is equal to the base of the plate, then, using the table as is directed, the quotient obtained is 1 and the angle 53°. From the figure, which is to scale, it is evident that,



arrange the plate as you will, at least two, and if placed centrally all four, corners must be uncovered, *i.e.*, outside the circle of illumination.

"The table itself is correct when used as is usually directed by dividing the diagonal of any given plate by the focal length of the lens (see Dr. Eder, *Recepte und Tabellen*, fourth edition, page 94). If, therefore, the directions for using it were altered by substituting 'diagonal of the plate' for the words, 'base of the plate,' the results obtained would be correct. It would save trouble if beneath the table were printed the length of the diagonals of the plates most commonly used :—

$3\frac{1}{4} \times 3\frac{1}{4}$	diagonal	4·6 inches.	$6\frac{1}{2} \times 8\frac{1}{2}$	diagonal	10·7 inches.
$3\frac{1}{4} \times 4\frac{1}{4}$	,,	5·3 ,,	8 × 10	,,	12·4 ,,
4 × 5	,,	6·4 ,,	10 × 12	,,	15·6 ,,
$4\frac{3}{4} \times 6\frac{1}{2}$	,,	8· ,,	12 × 15	,,	19·4 ,,
5 × $7\frac{1}{2}$	,,	9· ,,			

MARTIN'S METHOD OF PRODUCING BAS-RELIEF PHOTOGRAPHS.

THIS method, which we referred to last week, is described by the inventor in the following terms: He first makes a negative in the usual way. On the film side, and near the corners of this negative, he attaches wafers of opaque paper cut out by means of a steel punch. The wafers are placed as far away as practicable from the centre of the picture, in order that they may be out of the way, and covered when the picture is mounted. The back of a sheet of sensitised paper, preferably that known as rapid bromide, is placed in contact with the negative in a printing frame, and a reversed image of the picture obtained by exposure in the usual way. Images of the wafers will appear with the image of the picture. The reversed image thus obtained is mounted upon a block or piece of wood about half an inch in thickness. When dry, the outline of that part of the figure which it is desired to emboss is carefully traced over with a lead pencil, and the block is then pierced through with a fret-saw, following such pencil lines, thus leaving a perforation, the boundary of which will coincide with the outline of the figure. A finished positive print is now made from the negative, and mounted upon thin sheet brass, copper, zinc, or other ductile material, and, when dry, the portions covered by the images of the wafers are cut out by the steel punch. This perforated positive picture is then laid face downwards upon the reversed image, or such parts of the reversed image as are left upon the pierced block, care being take that the perforations exactly correspond with the images of the wafers on the block.

A pad of thick sheet indiarubber or wadding is now placed upon the metal backing of the positive picture, and the whole subjected to pressure under a press; an ordinary copying press is admirably suitable for the purpose.

On removing the picture from the press, it will be found that the parts extending over the perforation in the block have been pressed forwards in the perforation, and have assumed a pleasing general bas-relief effect.

To model the more delicate details, the picture still in contact with the pierced block is placed in a vice, or otherwise held firmly, to leave the artist's hands at liberty to work on either or both sides of the picture, and so that he may gently depress from the front such parts as are required, and press forward from the back such other parts as he may desire. For this work pencils, preferably of soft wood shaped to suit the requirements, may be employed; but, if the fingers are used, soft leather or kid gloves, or finger stalls, should be worn, in order that the picture may not be marked.

If thought desirable, the indented portion at the back of the picture may be filled with plaster of Paris, or the like, to render it solid, but this is not necessary when the picture is to be protected under glass in a frame.

BACKING EMBOSSED PHOTOGRAPHS.

AN embossed photograph comprises a photograph made by any of the usual processes, which is then embossed in any suitable shape, says Mr. H. Piquet, the inventor of the method described below; it is then padded with wadding to prevent the embossing from sinking, it is then fastened on to a mount or support with glue, or other adhesive substance. This mode of padding or backing the aforesaid photographs or the like is very unsatisfactory, as the embossing soon sinks in consequence of the wadding becoming compressed, and requires much time and skill to produce satisfactory results.

My objects are to so apply a suitable padding or backing so that less skill will be needed and less time required, and at the same time to improve the quality of the finished photograph or the like.

To these ends my invention consists in the mode of backing or padding embossed photographs or the like with backs or shields made of metal or other suitable materials, which will give a firmer and more durable support, and the manner of applying the same is hereinafter fully described and set forth.

The aforesaid backs or shields may be made of any sheet metal, composition, or other substances suitable for the manufacturing of the aforesaid backs or shields, and may be perforated or ribbed if desired, but preferably left plain, and may be embossed by stamping out in the usual way with a stamping machine or other device, or can be made by moulding or casting as may be found convenient for the purpose.

The shape and embossing of the aforesaid backs or shields must correspond with the shape and embossing of the aforesaid photographs or the like, and can be made to any shape or depth as shall be required, and may have the edges serrated or notched, forming teeth, so that the edges may be pressed into the mount or support, thereby holding it in position; the edges may be serrated in part only if desired, but preferably left plain.

The backs or shields are made slightly smaller than the photograph or the like to which it is to be applied, to allow the said photograph to overlap the shield thereby forming a margin around the shield to allow the photograph being placed in contact with the mount or support.

I now proceed by embossing a photograph or the like in the usual way, I next prepare the back of the photograph or the like with a coating of glue, albumen, shellac, or other adhesive ingredients possessing the quality thereof; the glue, albumen, shellac, or the like, is left to become partially dry or tacky, then a back or shield of suitable shape, size, and depth, is placed with its convex side on the back of the photograph or the like, then the photograph with its back or shield attached is placed in position on the mount or support, and the edges pressed down and held in close contact with the said mount or support by any suitable means or device until set.

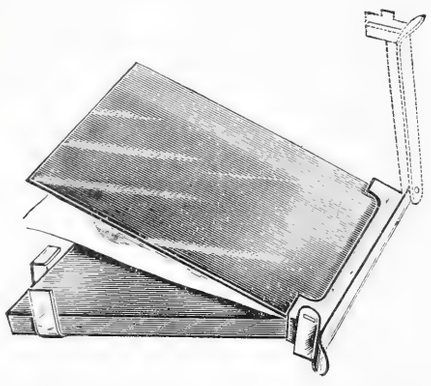
The operations of mounting the said photograph or the like may be performed by placing a back or shield with its concave side next the mount or support. I then prepare the back of the embossed photograph or the like by applying a coating of adhesive substance as hereinbefore described. I then place the photograph with its back in contact with the convex side of shield, and press the edges of the photograph in close contact with the mount or support, and hold the same in position by any suitable means or device until set.

Our Editorial Table.

The Premier Printing Pad.

C. Shaw, 104, Aston-road, Birmingham.

This printing pad consists of a hinged board of papier-mâché, having at one edge a hinged metal bar opening automatically, and a spring clip fastener at its other end. Affixed to the under side of this bar are rubber pads, which press on to the negative, and allow of nega-



tives of any thickness being used. At the opposite end of the pad is a sliding bolt working upon a flat spring, which gives an even pressure over the surface. To use: Open the metal bar, place the paper on the pad, sensitised side up, then the negative film side down; fasten the bar down, then lift up and slide over the bolt at the other end of the pad. To examine during process of printing, slide back the bolt and the hinged pad will open like a book showing 9-10ths of print.

The Schleussner Dry Plates.

Agent, C. A. Rudowsky, 3, Guildhall-chambers, E.C.

Mr. Rudowsky sends us samples of Dr. Schleussner's "extra rapid" dry plates. Tested in the camera, we find the plates extremely rapid, yielding with metol development negatives of good quality and free from fog.

The Rudowsky Plate.

C. A. Rudowsky, 3, Guildhall-chambers, E.C.

This is a plate labelled "ordinary." It is of medium rapidity, and the quality of the image is such as to indicate that it is suitable for work in which great density of deposit is a desideratum. It is clean in development and appears to have been very carefully prepared.

Lüttke and Arndt's Neutral Toning and Fixing Salt.

Agent, C. A. Rudowsky, 3, Guildhall-chambers, E.C.

We subjected this toning and fixing salt to practical trial with gelatine, albumen, and collodion prints, and were extremely pleased with the agreeable tones obtained; for albumen prints it appears especially suitable. The hypo used in the compound is stated to be chemically pure. After filtration the bath is claimed to keep well, and sulphur toning is said to be obviated. Permanency of result is also claimed. To those who appreciate the convenience of the combined bath this neutral toning and fixing salt should be welcome.

The "D. A." Hand Camera.

Manufactured by David Allan, 157, Whitfield-street, Fitzroy-square, W.

Mr. David Allan who has been a manufacturer of photographic apparatus for about thirty years, and who has hitherto supplied the trade only, informs us that in future his goods, of which he is the actual manufacturer, will be available to retail purchasers. The business has so far mainly consisted of the production of metal goods — washing trays, dark-room lamps, &c., but an apparatus department has been added, cameras, stands, and so forth, now being made by a large staff of workmen. The "D. A." hand camera appears upon examination to be a simple and effective as well as a cheap instrument. The shutter is of the ever-set variety, and time or instantaneous exposures may be given, control in this respect being had by the movement of a pin on the front of the camera. The plates are contained in sheaths which are released by the movement of a small lever on the top of the camera, to which two finders and an achromatic single lens are fitted.

Catalogues Received.

Penrose & Co., 8, Upper Baker-street, Lloyd-square, E.C.

This catalogue of "photo-process machinery and supplies" extends to 220 pages, and is without doubt, in respect of its fulness and completeness, of enormous value to process workers, who may consult its pages in the expectation of finding nothing omitted for which they are likely to have use in block work. Its first seventy-eight pages are devoted to the ordinary requirements of the craft in the way of apparatus and sundries; and succeeding sections deal respectively with special apparatus for line and half-tone reproductions; engraving and etching tools and appliances; mounting and finishing tools; copper-plate etching and photogravure; photo-lithography; collotype; process drawing materials; electric lighting; chemicals, &c. It is a handsome production, the mere perusal of which is itself almost an education in process work.

Ross & Co., 111 New Bond-street.

From Messrs. Ross & Co. we have received a brief pamphlet descriptive of the Photoscope, an ingenious little instrument, which combines the uses of a marine, field, or opera glass, and a photographic camera, and in connexion with which there is announced a "Photoscope" competition, entries for which must be made by September 30, 1897.—Accompanying an excellent brochure on the electric arc light for optical projection are descriptions of the Ross-Hepworth arc lamps and Hepworth's eccentrical carbons—A new plate or film changing box, which serves both as a magazine and dark slide, is also described in a supplementary list.

Primus Photographic Specialities.

W. Butcher & Son, Blackheath.

Many seasonable and useful novelties in photographic apparatus are described in this list, hand cameras being made a speciality.

News and Notes.

Royal Photographic Society.—Ordinary Meeting, Tuesday, June 8, at 12, Hanover-square, at eight p.m., *Photographic Surveys*, by Mr. C. J. Fowler Hon. Secretary of the Birmingham Photographic Society.

We are sorry to learn of the death of Mr. T. C. Belton, in his seventy-eighth year. Many of our older readers may recollect that the deceased gentleman was for a long time associated with the late Mr. Francis Bedford. He was also once well known as a trade printer, &c.

Messrs. Fuerst Brothers, of 17, Philpot-lane, London, E.C., write: "With reference to Lumière's cinematograph film views, we shall be glad if you will announce the fact in your paper that we have reduced the retail price of same from 3*l.* 10*s.* to 3*l.* 2*s.* each. Off this price, of course, the dealers receive a liberal discount."

Photographic Club.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, June 9, at eight o'clock. Members' Open Night. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

Blairgowrie and District Photographic Association's Second Exhibition.—This Association has decided to hold its second Exhibition in the Public Hall from January 16 to 21 next. The following are the classes: Open competitions—Champion Class, for previously medalled pictures; ditto, previously medalled lantern slides; lantern slides in sets of four. Open to Professionals—Landscapes or seascapes; figure studies and portraiture. Open to Amateurs—Landscapes and seascapes; figure studies and *genre;* hand-camera work; moving figures. Open to Members—Any subject. A silver and a bronze medal will be awarded in each class, and, in addition, similar prizes will be given for the best exhibit of apparatus, "general excellence" to be the deciding point. Special entertainments will be held each evening during the Exhibition, and the experience gained at the Association's last Exhibition (which was a highly satisfactory one) and the enthusiasm of the members promise another success.

Popular Photographic Printing Processes. — Mr. Hector Maclean, F.R.P.S., President of the Croydon Camera Club, whose book, *Photography for Artists*, published last year, obtained such a good reception, has now in the press another work, under the first-named title, which is likely to prove very acceptable to all who work with a camera. It will epitomise the leading characteristics and procedures connected with over a dozen, including all the more popular, methods of photographic printing in vogue. The information will be all the more valuable as being based upon the direct experience of the author and other practitioners, rather than founded upon information taken from older text-books. Amongst many other welcome features will be included a special contribution by Mr. F. P. Wratten, A.R.C.S., dealing with the new gum-bichromate process, besides Mr. Maclean's description of the Artigue process, working details of Packham's system of toning platinotypes, and a chapter devoted to the colouring and touching-up of prints. The book, which will be fully illustrated, is to be published by Upcott Gill, at the popular price of 1*s.*

How China Ink is Made.—In the course of a report to the Foreign Office on the trade of Wuhu for 1896, Consul Fraser says: "This province produces the celebrated Indian ink, more correctly called China ink (*encre de Chine*), used by artists who paint in water colours. . . . From here it goes to every part of China and all over the world. In 1895 about two tons of it were exported to foreign countries from Shanghai, valued at 564*l*. It may be made in other parts of China, but the best comes from this province. The materials with which this beautiful black ink is made are the following:—(1) Sesamum oil, colza oil, or the oil expressed from the large poisonous seeds of what Dr. Brettschneider calls the *Dryandra cordata* or *Elococcca verrucosa*, called by the Chinese 'We Tung,' a tree extensively cultivated in the Yangtsze Valley, and also well known in Japan; (2) Varnish; (3) Pork fat. The lamp-black made by the combustion of these substances is classed according to the materials and the grade of fineness, and also according to the time taken over the process of combustion. The paste made of this lamp-black has some glue added, and is beaten on wooden anvils with steel hammers. Two good hammerers can prepare in a day eighty pieces each weighing half a pound. A certain quantity of musk (of the musk deer), or of Baroos camphor for scenting it, and gold leaves are added, the latter, the quantity of which varies from 20 to 160 to the pound, being to give a metallic lustre. The materials thus prepared are moulded in moulds of carved wood, dried (which takes about twenty days in fine weather), and adorned with Chinese characters in gilding. About thirty or thirty-two average-sized sticks go to the pound. The price varies from 2*s*. or less per pound to so much as 7*l*. per pound, there being over a dozen different grades. Nearly all writing is done by the natives throughout this immense empire, in Japan, Corea, Tonquin, and Annan, with this China ink, rubbed down on a stone ink slab, and applied with a paint brush of sable, fox, rabbit, &c., hair, set in a bamboo holder, and when not in use carefully covered with a protecting brass cap. The superior kind of this ink appears to be used in China and not exported."

Patent News.

The following applications for Patents were made between May 19 and 26, 1897:—

Lantern Pictures.—No. 12,156. "Improvements in and relating to Magic-lantern Pictures." R. J. W. Down.

Cameras.—No. 12,203. "Improvements in Photographic Cameras." H. Wood.

Clamping Box for Cameras.—No. 12,319. "An Improved Levelling and Clamping Base for Theodolites, Photographic Cameras, and the like." A. I. Littlejohn and P. Still.

Camera Cap and Shutter.—No. 12,451. "A New or Improved Combined Cap and Shutter for Photographic Cameras." J. J. Malone.

Animated Photography.—No. 12,468. "An Improved Method of Taking, Projecting, and Viewing Kinetoscopic and other Photographic Pictures." J. H. Reeves.

Hyposulphite Removal.—No. 12,482. "A New or Improved Process for Removing the Hyposulphites from Photographic Negatives and Prints." Complete specification. P. Mercier.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
7	Hackney	Excursion: Battlesbridge. Leader, W. Selfe.
7	North Middlesex	Excursion: Benfleet. Leader, Mr. Pither.
8	Hackney	Open Night.
8	Royal Photographic Society	*Photographic Surveys.* C. J. Fowler.
9	Photographic Club	Members' Open Night.
9	South London	*Developers: their Constitution, Use, and Abuse.* C. F. Dickinson.
10	London and Provincial	Paper by E. J. Wall.
12	Darwen	Excursion: Tockholes and District. Leader, J. W. Smith.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 27,—Mr. R. P. Drage in the chair.

The Affiliation.

The Hon. Secretary raised the question of the continuance of the Association's subscription to the Affiliation.

Mr. P. Everitt, in his capacity as one of the delegates, criticised at some length the past work of the Affiliation scheme, and gave his impressions of its present state. The principal thing done in the past twelve months had been the ordering of certain lectures for circulation, and the collection of a travelling exhibition of pictures by well-known workers, and which served as a welcome adjunct to any local exhibition in different parts of the country. Despite this, however, he was of opinion that the position remained the same as when he last reported on the matter, and that the amount of good done was by no means equivalent to the cost of its support. The idea, when it was formed, of its being the nucleus of a photographic institute, had utterly failed, and he regretted the lack of interest in its welfare which was displayed on the part of the parent Society.

Mr. Welford suggested it would be a pity to withdraw at present, inasmuch as, if at any time efforts had been made to render the Affiliation of service, the year 1897 would stand to the front. The present Chairman had made great efforts, and he recommended a waiting attitude.

Mr. Rapson believed that there had been a great increase in the number of societies of late, and naturally with more funds more could be done. As regards the attitude of the Royal Photographic Society, that body was represented by three delegates, and the whole question turned upon the regularity of the attendances of the delegates of that and other societies.

Mr. Everitt added that one-half of the receipts was taken by the Royal Photographic Society, and he felt that, if it had any real interest in the concern, it should have shown more spirit and placed a greater proportion at the disposal of the Committee. He had fought hard for a more liberal treatment, but without success.

The Chairman said that everybody had lost sight of the fact that the Association had given its support not with the idea of benefit so much as for the good likely to accrue to photography throughout the country. He had heard of a lot in favour of the scheme, and, being of opinion that it would be a mistake to withdraw, he proposed from the chair that the subscription be continued as before, and this was carried, several others having spoken in favour.

Colour of the Negative Deposit.

Mr. A. L. Henderson made reference to some remarks, at a previous meeting, on the change undergone by a certain negative in printing quality, owing to the bleaching out, in course of continuous printing, of the yellow stain which composed a part of the image. In connexion with this point, he showed a negative taken by moonlight on February 22, 1880, developed with pyro and ammonia, and in which the original yellow colour was gone, leaving the negative in a practically unprintable condition. It had been hung for many years in a window, to which the action was due.

Mr. Welford had experienced no such fading with negatives continuously in bright sunlight for fifteen years, and, moreover, had some which would not yield to a reducer, and, if chemical action failed, the mere influence of light would not have much effect.

The discussion drifting on to the subject of intensification,

Mr. Henderson detailed a method of treating an under-exposed negative with mercury alone and exposing to strong light. More density was obtained by submitting it to the light action before treating with the alkali.

Mr. J. E. Hodd possessed slides intensified with silver cyanide, which had faded horribly in the dark, which caused some surprise. He did not know with what they were bleached.

Mr. Banks said that Mr. Henderson appeared to suggest that all pyro-ammonia negatives would fade; but, although as a rule this developer gave yellow negatives, he had not found them to fade more than negatives of pyro-soda, &c.

Mr. Bayston inquired whether anybody had tried copying, as a positive, a grossly under-exposed negative which had been bleached with mercury?

Mr. Henderson spoke of a similar thing which he had done, and the Hon. Secretary also mentioned a case.

Photographs of sun spots, and an X-ray print of a rabbit with fractured thigh bone, were shown by the Secretary.

PHOTOGRAPHIC CLUB.

May 19,—Mr. J. R. Gotz in the chair.

A letter was read from Mr. Snowden Ward in reference to his proposal that the Club should co-operate in naming or appointing a Committee to deal with certain funds now in the hands of the Benevolent Association. There being no expression of opinion by members then present, the matter was referred to the Committee.

Mr. Bridge showed some paper negatives which, he stated, had been made by the late William England about thirteen years ago.

Upon the suggestion of a member, Mr. Bridge said he would be very pleased to add them to the Club Museum.

The negatives were fine examples of what could be done by this process, and were made upon the Eastman Company's negative paper, the manufacture, however, not being now continued.

Mr. Welford passed round a series of reproduced positives and negatives produced by the use of Novitas stripping printing-out paper. He had experienced the difficulty of using a cloud negative, the foreground of which has a tendency to obtrude itself in the finished combination print. Taking advantage of the facility provided by the printing-out factor of this new paper, he was able to reproduce his sky negatives, and to "sun-down" the foreground in such a manner that it printed without any sign of either a join or a hard mark. The paper appears to be easy to manipulate, and may be described as a printing-out film of collodion coated upon a soluble gelatine substratum.

Mr. E. J. Wall, F.R.P.S., gave an interesting and lucid description of

The Spectroscope,

which he described as an instrument for conveniently observing the spectrum. It consists of a tube provided with a slit, which may be of any shape, the straight one being, in practice, the most convenient; a collimator, which is a device for centering the image; a prism or series of prisms for refracting the light and forming the spectrum; and an observing telescope. Describing the setting up of the instrument, the lecturer explained what the angle of minimum deviation was, and how to find it. He explained that the width of the slit affected the purity of the resulting spectrum, and that the impurity was caused by the colours overlapping and dimming one another. Newton was the man who first saw the spectrum, but Fraunhofer was the first to give serious attention to it, and to observe the lines which are at once its most characteristic feature and the great source of its utility for scientific purposes. The result of Fraunhofer's investigations was embodied in the science of spectrum analysis. Mr. Wall demonstrated the various spectrum images produced by different kinds of glasses, dealing with and explaining the meaning of the terms refractive index and dispersion, &c. He described the direct-

vision spectroscope, an instrument in which some of the prisms neutralise the refraction of the other prisms without interfering with their dispersive power. The visible and invisible spectrum were explained, and contrasted by means of lantern diagrams, the invisible portion being more than twenty times as long as the visible. The meaning of, and the method of ascertaining, the wave-length of lines were described. Dealing with other methods of obtaining a spectrum, the ruled grating was described, and some specimens shown. The latest forms, said Mr. Wall, are made in metal, and are concave, thus forming their own images, and doing away with the necessity for any optical device for forming them. These, however, are expensive, the smallest costing from 20*l.* to 45*l.* each. Dealing briefly with the subject of spectrum analysis, the lecturer said that so sensitive was the method that one two-hundred-and-fifty-thousandth part of a grain ($\frac{1}{250000}$) of sodium could be detected. The spectra of the metals could be examined by burning them in a lamp, or by a spark from an induction coil, or in the electric arc. The most interesting use of spectrum analysis was for the examination of the heavenly bodies. By its aid two things could be determined—the presence or absence of the elementary substances, and also the determination of motion in the line of vision. The examination of the corona of the sun had been attended with interesting results, and Dr. Huggins had made many discoveries in this connexion. The examination of the nebulæ and comets had also produced important revelations. Finally, Mr. Wall added to the obligation under which he had placed the Club for a most interesting scientific lecture, and for which he was thanked by the Chairman, by promising to give a further lecture in November next.

May 26,—Mr. Sidney Keith in the chair.

Mr. S. H. Fry, in introducing Mr. R. L. Jefferson to the meeting, said that probably he would be known to it as a cyclist who had travelled widely—some 54,000 miles, he believed—over Europe and part of Asia.

Mr. Jefferson, in response to a hearty welcome, said he was exceedingly obliged to the members for their courteous reception. Since so hearty a welcome had been given to him, he hoped this would not be his last visit.

Mr. Frank Haes showed some prints from paper negatives, and took the opportunity to reiterate his complaint that Eastman's negative paper was no longer obtainable.

The Chairman drew attention to the fact that there were many attendants at the meetings who lived some little distance out of town, and to them an early commencement was a vital question.

Mr. Thomas Fall then addressed the meeting upon a very wide variety of subjects. He accompanied his remarks by handing round examples of old prints and negatives, some of which he was good enough to promise to present to the Club museum.

Brixton and Clapham Camera Club.—May 18.

Carbon Printing.

Messrs. Braham and Burton, representing the Autotype Company, gave a demonstration on the single and double-transfer method on opal and paper, carbon-transparency making, &c., the whole being carried out so smoothly and successfully as to say much for the ease and simplicity of the process, an exhibition of prints and transparencies showing also its beauty and variety. The following is a review of the demonstration: The carbon or pigment process is based upon the fact of bichromatised gelatine becoming insoluble in hot water by the action of light, any colouring matter mixed with the gelatine being also imprisoned. It has many advantages. One is its absolute permanency, reliable pigments being used; another, its wide range, it being considered that the carbon method will give a greater variety of result than all other photographic processes combined. Any colour, from engraving black to brown, sepia, green, blue, &c., can be got on glossy, matt, or rough surface, and the prints may be on paper of any desired tint. The tissue is bought of the desired colour, sensitised or unsensitised. In the latter condition it keeps indefinitely, and is sensitised, when required, by immersion for three minutes in a five per cent. solution of potassium bichromate, and dried in the dark room. Sensitised, the tissue keeps in good condition about a fortnight, and it is best to buy the sensitive tissue when possible. Before printing, the negative should be prepared with a safe edge of black varnish or opaque paper; this prevents the loosening of the margins of the print during development. Somewhat dense negatives are most suitable for the process. As no visible image is shown by printing, an actinometer must be used to judge the correct exposure. Of the various forms, Burton's, consisting of a series of small negatives of different densities, is about the best. A little experience soon gets over any difficulty in printing. Roughly, carbon tissue is about three times the rapidity of albumen paper. The printed tissue is put in a dish of cold water, along with a piece of single-transfer paper (a paper prepared on one side with a coating of insoluble gelatine). The tissue will first curl up, then begin to uncurl. At this stage the two papers are lifted out with their prepared surfaces in contact with each other and well squeegeed together, and then placed under blotting-boards for about ten minutes. If a rough-surfaced transfer paper is used, it should have had an hour's soaking before use, and must also be left between the blotting-boards for a longer time, so as to ensure thorough contact. The next operation is development. The adhering papers are placed in hot water (100° to 110°), and, as soon as the gelatine begins to ooze out between the edges, the old paper is stripped off (taking care to keep completely under water, or marks will result) and thrown away, the insoluble and the greater part of the soluble gelatine being left upon the transfer paper. Hot water is dashed over until all soluble matter is removed, leaving a picture in insoluble gelatine. When development appears complete, the print is placed for a few minutes in clean cold water, to stop development, then in a five per cent. alum solution for ten minutes, to harden the gelatine and remove any trace of bichromate. After a rinse in cold water, the thing is complete and only requires drying. Instead of the transfer paper, a piece of matt opal may be used, and requires no preparation, the rough surface of the opal securing perfect adhesion. Considerable control can be got in development. For under-prints use cooler water, thus washing away less of the gelatine, and, for over-prints, use hotter water. Hot water may be poured on to parts requiring brightening up, as heavy shadows, &c. This, "the single-transfer process," gives pictures reversed as regards right and left, a matter of no consequence in pure landscape, but undesirable in architectural subjects. To get over this difficulty reversed negatives are necessary, or the double-transfer process may be adopted. The procedure, up to the transfer, is the same as before; but, instead of the single-transfer paper, the tissue is squeegeed on to a temporary support—a paper coated with lac solution and well waxed. The picture is developed on this support and allowed to thoroughly dry. To transfer, the final support is soaked in cold water for half an hour or so, the picture on its temporary support placed in hot water, at 120°, and one of the soaked pieces of final support brought in contact with it, lifted out and well squeegeed, and allowed to dry. The temporary support is then stripped away, and, after rewashing, can again be used. For pictures with matt surface, a piece of ground opal, waxed in a similar manner to the paper, is used as the temporary support. Transparencies are made by either the single or double-transfer method, a piece of glass being used for the single-transfer or final support. This glass must be coated with a thin solution of gelatine containing chrome alum and allowed to dry in the light. In printing the transparency tissue, remember the picture is to be viewed by transmitted light, and three or four times as much printing is required as for a paper picture. The continuating action of light must be allowed for. In damp weather this is considerable, and much under-printed tissue will, if kept for a few hours between printing and development, give results similar to what would have been the case had printing been right in the first instance. By keeping the tissue dry, the continuing action does not occur.

Croydon Camera Club.—The meeting on Wednesday, May 26, was devoted to snap-shot photography, with special relation to

Hand Cameras.

Of these last a number were shown and described by various members. Amongst the more notable patterns were Adams's Ideal (twin lens), explained by Mr. Richardson, the chief feature being the rapid and certain changing mechanism of the plates, held in sheaths. Mr. J. Smith exhibited a new pattern, known as Fallowfield's Premier, in which the changing is neat and certain, being upon the "bag system;" the camera was greatly admired for its neatness and general completeness of design and finish. Mr. Linton explained the Memorandum Frena, which occasioned some discussion. Mr. Harris described the Facile, which, although rather bulky, is both light and efficient. Mr. E. A. Woodcock exhibited two varieties of the Agalma hand camera, the better of which, fitted with a rapid rectilinear lens and focussing adjustment, &c., was considered the best all-round pattern until then described. Mr. Woodcock also tabled a number of attractive prints from negatives taken in the above. Mr. D. P. Roberts showed a hand camera, called the Holborn, which in several essentials was identical with the last-named, but was fitted with a landscape lens instead of a doublet one, the price being proportionately less. Mr. Roberts also showed his very convenient hypo-solution bottle, which does away with the need of weighing up the above-named salt, all that is necessary being to pour in a quart of water and add hypo until water rises to one of the marks, which indicate from one ounce to the pint and upwards, to saturation point. Prints taken at the Club Excursion to Esher and Moulsey were displayed. Mr. Herbert Peter Stezziger was elected a member.

Gospel Oak Photographic Society.—May 18.—Mr. W. E. Debenham gave a very interesting evening on *Plate-backing* as a means of minimising halation. His remarks were ably illustrated by means of the blackboard and a prism, which he brought to the meeting, showing the effect of different backings. He also showed a home-made drying box, so arranged that a current of air could pass through, and at the same time it was light-tight. He used a bottle of hot water, placed in the bottom of the box, which increased the temperature and soon dried the plates.

Hackney Photographic Society.—On Tuesday, May 25, at the weekly meeting of the Society, Dr. Gerard Smith gave a lecture on

The Röntgen Rays,

in the course of which he expressed a desire that the members might study the subject in a scientific way, and not merely be content with the showy or popular side. He dealt fully with the physics of the subject, showing how that matter consisted primarily of molecules, and that these molecules, according to the forces acting upon them, existed together in the form of a solid, a liquid, or a gas, and further that gases become attenuated by reduction of pressure, as in a vacuum—which latter, by the way, was only a comparative term, for no perfect vacuum could be obtained—another series of phenomena came into action. By means of the magnificent ten-inch coil of Dr. Ambrose Kibler, who assisted at the demonstration, the lecturer showed many experiments in connexion with the subject. It was shown that, when the current was passed through a tube with a low vacuum, the internal luminosity was general; but, when the vacuum was increased, the luminosity became proportionately more localised to the region of the terminals, and the glass of the tube commenced to fluoresce. This was explained by the fact that as the molecules of air remaining in the tube became further apart, so, instead of bombarding each other and producing a glow in the general body of the tube, they flew direct to the other end, and caused the glass to fluoresce by their impact. On the subject of the X rays Dr. Gerard Smith showed that there was no ratio whatever between substances penetrable by these, and substances transparent to light. Wood, gas, coke, vulcanite, &c., more or less opaque to light, were easily pierced by the X rays, whilst glass, so transparent to light, was about the most opaque to them. The value of the Röntgen rays surgically was that they passed through flesh more easily than through bone. The lecturer, with the aid of the fluorescent screen, showed the bones of the ribs, spine, &c., of a lad, the beating of the heart and movement of the diaphragm being also plainly seen, and a gentleman among the audience, who had, a long time before, broken his arm, and had never since regained full use of it, had the cause discovered by means of a photograph taken of the injured limb at the meeting.

North Middlesex Photographic Society.—May 24, Mr. J. MacIntosh in the chair.—Mr. H. H. Lee was nominated for membership. Mr. HENRY CROUCH then read a paper on

LENSES.

He did not confine himself merely to photographic lenses, but described the various forms and their uses, beginning with the spectacle lens, as having practically no angle up to a microscopic objective, which has a very large angle. He illustrated the meaning of the terms chromatic and spherical aberration by means of diagrams on the blackboard, and also demonstrated how astigmatism in a lens showed itself by a very practical method. He passed round some small discs of glass curved only in one direction, and told the members to rotate them while looking at a diagram on the wall which consisted of lines radiating from the centre. As each line became parallel with the curvature of the glass it became distinct, while the rest were blurred. He showed a lot of specimens of the new glasses from Jena, and explained their difference from the older forms, and the advantages they gave the optician. He ended by showing the performance of an oil immersion one-twelfth of an inch objective on a test object. After a few questions and some discussion, a hearty vote of thanks was tendered to the lecturer.

South London Photographic Society.—May 24, Mr. W. F. Slater (Vice-President) in the chair. Mr. OTTO SCHÖLZIG attended and gave a demonstration of the working of

NOVITAS STRIPPING PAPER.

He said the paper was printed in a frame in the ordinary way, but, if the print was required to produce a transparency, it had to be printed darker than was necessary for tranfer to opal. Washing was done in five or six changes of water. Any prints which curled should be flattened out in the dish. The toning bath was composed of water, 16 ounces; sulphocyanide of ammonium, 48 grains; chloride of gold, 5 grains. The best results were obtained by using only sufficient of the toning bath to keep the prints covered. Toning occupied about five minutes. A used bath could be used again after adding about half its bulk of fresh solution. The prints were fixed in hypo (two ounces to the pint) for eight to ten minutes. After fixing, the prints were washed for fifteen to twenty minutes in running water, after which each individual print was placed face downwards in water on a piece of vegetable parchment, supplied with the paper, and then transferred together to a dish of hot water to dissolve the substratum of the film. While the softening is proceeding, coat the support intended to be used for the print with a solution of gum arabic (a quarter of an ounce to three ounces of water). Detach the film from the paper support, carefully sliding it back into the water. Remove all particles which may be found adhering to the film, and place it, with the vegetable parchment, face downwards on the final support. Rub down with a roller squeegee, avoiding air bubbles. Pull off the parchment paper, and clear away the excess of gum forced out by the squeegee. When nearly dry, give the film a coat of gum-arabic solution for a short distance round the edges with a brush. When dry, give the print a coat of varnish. The use of this paper for the production of cloud negatives was referred to.

Bath Photographic Society.—The first Excursion of the season took place on Saturday, May 22, to St. Catherine's Court. A well-filled brake left the city at 1.30, and, after a good run through the charming scenery of St. Catherine's Valley, the rendezvous was reached, when the best conditions for photographic work prevailed. Through the courtesy of Mr. Gibbard, the party soon got to work, and ere long it was discovered that the house, the church, and the superb grounds had monopolised most of the stock, leaving very few plates, &c., for the interior. Everything, without restriction, was open to the visitors, and many of the treasures the house contains were examined with much interest. The return journey was made by way of Monkswood.

Bradford Camera Club.—May 27.—The new rooms at 22, St. George's-chambers, Westgate, Bradford, were formally opened by the President of the Club (Mr. Walter Booth). The association came into existence in February last, and has already nearly a hundred members, a signal proof that there was an excellent field for its own special department of work, which is to provide information for young amateur photographers. Accommodation for the Society was first taken in the Colonnade, but the membership having become so considerable, the Committee have felt justified in obtaining larger and more convenient rooms. In St. George's-chambers, Westgate, they have secured excellent apartments. There will be a large and convenient dark room, a studio for portrait work lighted with a top light, and a large room for meetings and demonstrations, which, during the winter, are held weekly. The rooms of the Association are open at all times of the day to the members. There was a large attendance of members and friends at the opening gathering last night, and a pleasant evening was spent. Mr. Walter Booth, during the proceedings, gave an amusing sketch, descriptive of the difficulties of an amateur photographer, and Messrs. A. J. E. Hewett, W. W. Abbott, J. Wallace, J. Salter, Miss E. Coe, Miss V. Coe, and Mr. W. Allott also contributed to the musical programme. Mr. S. Hampshire acted as accompanist, the pianoforte being kindly lent by Joshua Marshall & Co., Limited, of Bradford. During the proceedings a fine collection of photographs, taken by members of the Society, was on view, and a very interesting exhibition of animated photographs was given by Mr. Cecil Wray, of Bradford, by means of the cinematograph. The Exhibition included several local scenes, which were regarded with very much interest. During the proceedings thanks were expressed to those who had assisted in securing the success of the Exhibition.

Bradford Photographic Society.—May 27, Mr. Oliver Nicholson presiding.—Mr. F. COWBURN gave a lecture, entitled

PHOTO-CERAMICS: A NEGLECTED PROCESS.

The lecturer said that photo-ceramics, or vitrified photographs, on porcelain, china, enamel, &c., have not been taken up in the manner that their beauty, permanency, and comparative ease of production entitled them to, and that the members would agree with him at the close that he had not called it a neglected process without just cause. Mr. Cowburn gave a brief outline of the introduction of photo-ceramics, which dates back as far as 1856, so that the process is not a new one, and, although full working details have been repeatedly published by the photographic press during the last twenty years, he thought that he might say, without fear of contradiction, that there were at the present time hundreds of amateur and professional photographers who have not seen any, or know anything about the production of them. Formerly, the cost of materials for this process was rather high, and to this, no doubt, can be attributed one reason of them not becoming more popular, but this cannot be said of it at the present time, for there are outfits advertised for the dusting-on process at about five or six shillings. There are four processes for the production of photo-ceramics—dusting-on or powder process, substitution, peppertype, and one that Mr. A. L. Henderson, of London, introduced. When the lecturer said that details had been published, it was in respect to the two first—dusting-on and substitution. Peppertype is an adaptation of the powder process, and was invented by a Mr. Wall, and called by him Variography, and the one by Mr. A. L. Henderson, in which he thought the metallic oxides are used to form the image. In the application of this process to enamel tablets suitable for scarf pins, rings, brooches, lockets, &c., for the decoration of china vases, five-o'clock tea sets, dessert services, &c., nothing could be more beautiful. Mr. Cowburn then gave an outline instruction how to proceed in the working, first in the making of the transparency, then in the making of the sensitive mixture for coating, formula of which he gave out, with instructions how to use; he then explained how to proceed with the printing and developing, and, finally, the burning in. The lecturer showed to the members present sketches of a furnace, such as is used for this purpose, and explained the method of procedure, but recommended that any one taking up this branch should send anything they might be doing to be burnt in to some one who had experience in such matters; the cost would only be small, and would almost in every case ensure good results. Several questions were asked at the close and very ably answered by Mr. Cowburn. A hearty vote of thanks was given to the lecturer, on the proposition of the Rev. W. H. EASTLAKE, seconded by Mr. W. C. RAMSHAW, and carried unanimously. A beautiful case of specimens was on view, kindly lent by Messrs. Morgan & Kidd, of London, and some vases and tablets by Mr. W. T. Watson, of Hull, to whom the lecturer said he was greatly indebted for their kindness in loaning such beautiful specimens to illustrate his paper, also a cup by Mr. Cowburn, who promised that, if any of the members took this process up and had any difficulty, he would be very pleased to give them any assistance he could.

FORTHCOMING EXHIBITIONS.

1897.	
June 23–30	Paper-makers', Printers', Stationers', Fine-art Publishers', &c., Exhibition, Royal Agricultural Hall, Islington, London, N. Managing Director, W. E. Aylwin, 27, Leadenhall-street, London, E.C.
December 9–11	*Aintree Photographic Society.

* There will be Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE H. & D. METHOD OF SPEED DETERMINATION.

To the EDITORS.

GENTLEMEN,—Having adopted the Hurter & Driffield method of speed determination, I find, after three months' testing of various makes, that the standard ferrous-oxalate developer speed numbers are the most accurate.

I have therefore decided that "Gem" plates will in future bear the standard ferrous-oxalate speed number only, and not the higher ones of metol, pyro-metol and other energetic developers.

The publication of this statement would save me a lot of correspondence and oblige,—Yours faithfully, T. E. H. BULLEN,

The "Gem" Dry Plate Company, Limited, Manager and Director.
Willesden Green, London, N.W., May 31, 1897.

REFERENCES.

To the EDITORS.

GENTLEMEN,—I read the letter of "Assistant" in your last issue with much pleasure, because his clearly expressed ideas show that he has thought over and considered his commercial position, which, I regret, cannot be said of the majority of assistants.

"Assistant" lays bare the root of the reference question when he instances the employer who uses labour-saving devices, inventions, &c., the employment of these things indicating the commercial advance of photography, and a change from a simple relation of master and man to that of the capitalist, manager, hands, and the factory system. When the employer has personal relations with his assistant, a reference has a peculiar value, since it is direct testimony at first hand. With the growth of photography, this simple relation is disappearing; the capitalist sees his hands once a week at most, and, in large firms, reference-giving is a mere formality, the manager having a stock set of phrases, and writing

them out as required; thus a good man receives the same reference as an indifferent one. These more complex relations, therefore, demand some less crude method of discriminating between good and bad workmen.

It has been suggested by some that the matter would be satisfactorily settled by making the reference a legal document; that is to say, the employer, assistant, and witness would attend before a magistrate, or other authority, and the reference be duly signed, witnessed, and stamped. This would give the reference greater value; but, in my opinion, it would not have a beneficial effect on the character and efficiency of assistants.

Improvement can only result as the assistant is thrown on his own resources, and so develops the qualities of self-help and self-reliance.—I am, yours, &c., JOHN A. RANDALL.

42, *Tonsley-hill, East Hill, Wandsworth, S.W., May* 31, 1897.

THE LATE P. MEAGHER.

To the EDITORS.

GENTLEMEN,—Referring to your obituary notice in your issue of May 21, any one who had the pleasure of knowing the late P. Meagher must testify to the excellent qualities of that esteemed gentleman.

As to your remarks that the side flap was the only original feature that he introduced into cameras, you appear to have lost sight of the fact that the folding sideboard, or flap, was incidental to the folding baseboard of his square bellows folding-body camera (for which he received a special jurors' report when it was exhibited at the International Exhibition, London, 1862), and was, without doubt, the origin of the present portability of field cameras.

Many other most useful adjuncts to the existing forms of cameras could easily be traced to the ingenuity of Meagher, but his delightful modesty precluded him from making himself well known to the photographic world as an inventor.—I am, yours, &c., ANDREW CADWELL.

30, *Musjid-road, Battersea, S.W., May* 24, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

William Mackay, 65, Church-street, Inverness.—*Photograph of two stags fighting.*

Brunskill & Co., Lake-road, Windermere.—*Photograph of Bowness Bay, Lake Windermere.*

EXPERIMENT.—Select a lens of either the Goerz or Zeiss form.

R. L. RICHARDSON.—See footnote, p. 69, in the number of the JOURNAL for January 29. The special powder is replaced by a two per cent. solution of formalin.

APEX.—The master cannot be compelled to give a character; but we believe he must give up the indenture of apprenticeship at its termination. That is a proof that the apprentice has served his term.

D. MUIRHEAD.—1. The advertised lens probably works at *f*-10 or *f*-11, but we have no knowledge of it. 2. At *f*-8 the lens should well cover the quarter-plate; better leave the stop where it is. 3. Have no knowledge of this.

EURYSCOPE.—The focus of the lens may be shortened by the insertion of a positive lens between the combinations. A working optician would undertake the job for you, and, of course, the mount would require cutting. The addition of the positive lens would probably produce increased roundness of field.

TONING.—PROFESSIONAL. 1. In all probability the first batch of prints exhausted the bath of the gold, as they were blue, and there was not sufficient left for the rest. 2. Ordinary whiting will do. 3. Better replenish the toning bath with gold after use, so as to be in order for the next day. Over-toning seems to be the source of your trouble.

PATENT SPECIFICATION.—S. BROWNING. There is no means of learning what the process is unless the inventor chooses to tell you. As the patent has not been completed, the provisional specification will not be published. Formerly, whether the patent was completed or not, the provisional specification was published, but it is not so now.

LENS.—M. MCANDREW writes: "A friend of mine has a lantern, fitted with a lens that seems to be identical with a portrait lens, and he has offered to lend it me during the summer months, if I like. Will you please tell me if it will do for photographic purposes with quick exposures? The lantern is one of ——'s best."—Yes, probably it will; but it is quite possible that the chemical and visual foci may not be coincident, and a correction, after focussing, for the actinic focus, may be necessary.

PURCHASE OF BUSINESS.—SYNTAX.—Yours is by no means an isolated case; but, so far as we can see, you have no redress. To have any, you will have to prove that the amount of business shown by the books was not done, and that the entries of the names of sitters, as you allege, are fictitious. If you can do that, it will show fraud, and then you have good cause of action.

SWEATING.—S. J. Any house that keeps the hands at work from half-past seven in the morning till eight or nine at night, with only an hour allowed for meals, may well be termed a sweating house. If the matter is brought before the Inspector of Factories, the thing will be put a stop to at once. The *employés* are entitled, under the Factories Act, to half a day's holiday in each week, and that the law will enforce.

BACKGROUNDS.—E. STANLEY. The method of making backgrounds by the powder process has frequently been given in detail in back volumes, and we cannot spare space in this column to do so again. Essentially, it consists of straining canvas on a frame, wetting it, and then dusting it over with a mixture of, say, lamp-black, whiting, &c., mixed with dextrine, and then well working it into the fabric with a stiff brush.

SPOTTY FILM NEGATIVES.—SPOTS asks: "Will you kindly say what you think caused the spots on enclosed film? It was developed with pyro and soda. Three or four out of a dozen were more or less spotty, though plates developed in same dishes, alum and pyro, were quite clean. Films have been out to India, and only developed last week. Would the changes account for them?"—Had all the films turned out spotty, we should have ascribed the spots to the emulsion; but, as only a small proportion of them do so, we are inclined to the opinion that the cause of the spots must be sought for in the manipulation.

SILVER PRINTS.—T. MYERS, writing anent the permanence of some of the old prints, referred to last week, asks, "Were not all the early prints toned in the combined toning and fixing bath?" and reminds us that we have more than once condemned the use of that bath. That is so, but the combined bath of old was very different from the modern one. It contained no alum, lead, or the other things now used, but simply hyposulphite of soda, chloride of gold, and water. Theoretically, even this bath is not so reliable, as regards permanence of results, as the alkaline system of toning as now used for albumen paper.

COLLODION EMULSION.—EMULSION asks: "1. Can you give us a formula for making dry-collodion emulsion same as Dr. Hill-Norris? 2. Can you tell us what will prevent frilling on the Hill-Norris plate? Have tried edging with rubber, but sometimes they blister badly all over and spoil the negative."—1. We do not know the details of the formula by which the Hill-Norris plates are prepared. The makers have not, so far as we are aware, published them, and probably are not likely to. 2. India-rubber ought to prevent the frilling. We have never experienced the trouble complained of with these plates. Write to the makers.

RESIDUES.—R. MATTHEWS writes: "I have just reduced several years' savings in a friend's furnace, and the result is nearly thirty ounces of metal, which I have run into a single lump. Now, I know that it must contain a fair amount of gold, as all the residues are mixed together. Is there any way of getting a better price for it than if it consisted of silver only?"—Yes. Cut off a small piece of the metal with a chisel, and send it to an assay office for a parting assay. For a small charge an assay note will be supplied, showing the proportions of gold and silver. With this note, a bullion dealer will buy the metal at the market price of the silver and gold it contains.

SPOTTY ALBUMEN PAPER.—PASTE BRUSH writes: "Would you kindly tell me how to prevent albumen paper from drying so unevenly after sensitising? I have already reduced my bath to forty grains per ounce, but have not entirely got rid of this objection. I suppose it is owing to the very warm weather we are having. I also keep the paper in the coolest room in the house. Thanking you for past kindness in answering my questions."—Some papers, at times, seem to be prone to dry in the manner complained of, owing to the silver solution being somewhat repelled by the albumen, and so collecting in drops. This may be overcome by blotting the paper off, after sensitising, with pure blotting-paper. If this course be pursued, a stronger bath should be used.

OPALINES.—F. G. C. writes: "A few opalines I have lately done have behaved in a very annoying manner. From the enclosed sample you will observe they have come away from the glass all round the edges, and you will also see that they have detached pieces out of the glass. As I have only glued round the edges of the opaline, I suppose this is the reason. The reason I do not glue them all over is because, on some I did, the glue discoloured them. Which is the best way to avoid the trouble?"—The reason the paper has come away, and brought the surface of the glass with it, is that a thick layer of glue, of a very contractile nature, has been applied at the back. The remedy, in future, is to use a less contractile glue, or to add a trace of glycerine to it, to prevent it arriving at an over-dry state.

CARBON ON OPAL.—H. PERKINS asks: "Will you tell me how to overcome the following difficulty? I have been trying my hand at printing in carbon upon opal by single transfer. I find the prints much more liable to blister than when developed upon paper. Can you advise me how to overcome this difficulty? Is there any remedy, except using double transfer? It seems as if there was too much suction in the ground surface of the opal to get proper adherence of the tissue. Thanking you in advance."—Carbon, by single transfer, on opal is one of the simplest forms of carbon printing. In all probability the glass was not perfectly clean. Scrub the glass with warm water and soap, rinse well with clean water, and try again. Do not leave the exposed tissue to soak too long before squeegeeing it on to the opal.

*** Several answers to correspondents unavoidably held over.

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EX CATHEDRA.

The Forty-second Annual Exhibition of the Royal Photographic Society will be held, from September 27 to November 13 next, in the gallery of the Royal Society of Painters in Water Colours, 5A, Pall Mall East. As hitherto, the Exhibition will be inaugurated on Saturday, September 25, by a private view, followed in the evening by a *conversazione*. It will remain open daily, from 10 a.m. to 5 p.m., and will also be open on Monday, Wednesday, and Saturday evenings, when lantern slides may be shown. This year, season tickets, price 5*s*., will be placed on sale.

* * *

The general regulations are substantially those adopted last year. There are to be two sections, art and technical, judged by two sets of jurors, whose names we have already announced. Exhibits must reach the Secretary of the Society on or before Wednesday, September 8, but exhibits sent by hand will be received at 12, Hanover-square, W., only from 9 a.m. to 9 p.m. on Thursday, September 9, after which time and date no exhibit can, under any circumstances, be received for competition. Prospectuses, blank entry forms, and any further information respecting the Exhibition, can be obtained from the Secretary of the Society, 12, Hanover square, London, W. This Exhibition is that usually held in the autumn by the Society, and must not be confused with the International Trade and Technical Exhibition to be held next year, under the same auspices, at the Crystal Palace.

* * *

The specimen grievance is always with us. A correspondent writes: "I sent a firm of photographers a certain number of specimens, and they were returned *minus one*. Of course, I wrote for it to be returned, and enclosed is a post card I have just received from them. This is the result of asking for your own property—an impudent post card—which aggravates the matter all the more. I never made any comment on their having *specimens of their own*, but simply sent a polite note requesting the return of my specimen."

* * *

The legend on the post card runs: "Your specimens are a perfect nuisance. *All* we received were returned—examine them again. We have a *few* specimens of *our own* at present." Without discussing the question as to who is likely to have been at fault in this particular case, we are bound to allow, from the result of lengthy observation, that many a photographer has every justification for terming the specimens sent him perfect nuisances. We believe that half the friction in this matter arises from the carelessness and stupidity of those who send specimens unaccompanied by return postages, the means of identifying the packages, or addresses to which they are to be sent. On the other hand, much heartless carelessness and downright robbery of specimens is systematically carried on by unscrupulous photographers, whose conduct in this respect casts discredit upon the entire profession.

* * *

We learn that to the recent Sandell Exhibition there were over 1700 visitors. The Company has engaged the gallery of the Cabinet Picture Society, 175, New Bond-street, for an Exhibition in July, at which Mr. Sandell, the managing director, will give demonstrations on the manipulation of the Sandell plates, on Wednesday and Saturday evenings. Lantern displays will also form a feature.

* * *

Mr. W. I. Chadwick, whose address is Westwood, Sale, Cheshire, sends us a little book which is devoted to synopses of

illustrated popular lectures that he is prepared to deliver before scientific and literary societies, and cognate bodies. Among the subjects synopsised are the X rays; The Marvels of Photography; Light, Sight, and Colour; The Sun, Moon, and Stars; Food, and its Adulteration; Stereoscopy; and the Microscope. Mr. Chadwick is an able and well-informed lecturer of great experience, and invariably meets with success at the hands of his audiences.

* * *

Even a photograph cannot always be relied upon for purposes of identification, if we may judge by the report of an inquest, recently held at Liverpool, on a steerage passenger named John Olsen Fondles, who died in his berth on the Cunard steamer *Campania*, 300 miles from Queenstown, on May 28. It was alleged that death was caused by strychnine, a bottle of which was found in his pocket, and deceased had told a fellow passenger, to whom he intrusted his cash and naturalisation papers, that he would die in a short time. The evidence of the *Campania's* doctor, confirmed by the post mortem, showed that death was due to acute congestion of the lungs. A Liverpool woman claimed the man as her husband, recognising him by his feet and a peculiarity of his big toe. She also produced a photograph, but the coroner failed to identify the connexion between the photograph and the deceased. The woman was directed to substantiate her claim in another court. The sequel of the case will be interesting, especially if it should transpire that the photograph was really that of the deceased.

* * *

Our contemporary, *Invention*, draws attention to a patented method of colouring photographs in oils or water colours. It states that the plan pursued is to mount the photograph on glass, or some other transparent material, and to remove the paper from the back thereof by the patent process, which leaves the film intact on the glass. The back of the now transparent film, of course, presents itself for artistic colouring, which is forthwith applied to it. The degree of artistic effect naturally depends upon the skill of the operator. Our contemporary highly praises the results, and recommends the process as an easy and remunerative one for ladies. The patent for this invention was taken out through the patent agency department of our contemporary, which is possibly unaware that kindred processes have already been patented times out of number, and that the commercial scope for photographs coloured on the back is very limited. During the last year or two several patent specifications for such processes have been commented on in these columns. One and all were simply rehashes of very old ideas.

* * *

It would appear that the poster fad is slowly dying the death. *Apropos* Mr. L. J. Rhead's display of posters at the St. Bride's Institute, one of the critics makes the candid confession that he would enjoy a respite from the brilliant-haired young ladies, attired in still more brilliant gowns, working typewriters, or engaged in other occupations for which they seem scarcely fitted. If a man can draw at all, he does not see why he should be forced to produce these timeless and sexless creatures, when there are people about who pursue just the occupations to which Mr. Rhead wishes to call attention, and who are, many of them, as we all know, interesting and charming enough to be drawn. Clearly, it is possible to overdo the production of the "unusual" thing, even in posters.

An impression having prevailed that spools of film positives as used for cinematographic projection were, in ordinary circumstances, harmful by reason of their supposed ready combustibility, we were given the opportunity one day last week of witnessing one or two experiments at the Eastman Company's Works at Harrow, which demonstrated how little fear there is of a spool of celluloid wholly taking fire. In the open air, and with a good breeze blowing, rolls of film were set alight at the edges by Mr. Harold Senier, the works' manager. The flame failed to spread to the remainder of the roll to any appreciable extent even under the incentive of the breeze, and the light, as we practically proved, could be easily extinguished by the hand. It may safely be said that a spool of celluloid, with the application of a flame, will not ignite more readily than a spool of paper, which is notoriously non-combustible; and, as there are no grounds for assuming celluloid film liable to spontaneous ignition, cinematograph operators and the public may dismiss all apprehensions of danger from those sources.

* * *

On Diamond Jubilee Day the members of the Camera Club will, doubtless, have a considerable appreciation of the advantages of their membership. The Club journal announces that the Club house will be open on June 22, and, in addition to their usual privileges, members will be entitled to introduce ladies for luncheon, tea, and dinner. It is anticipated that on this day there will be considerable difficulty in obtaining refreshment at the various hotels and restaurants, and this arrangement has been made in consequence.

A SUGGESTION IN PORTRAITURE.

Portraitists are still complaining of the lack of business of a remunerative character, and we fear there is but little prospect of its being materially better with many for some time to come, seeing the competition there is, owing to the large number who have entered the ranks of the profession since the introduction of gelatine plates. Unfortunately for the profession, with these plates but little skill or experience is required to become a "photographer." The only remedy—supposing the causes to be as just suggested—would, it seems to us, be the introduction of some new or novel style of picture that would take with the public, command a higher price than the present ones, and, at the same time, require greater skill and knowledge to produce than is possessed by the majority of those who have brought photography down to its present state as a profession. What such a style or process should be, it is difficult to suggest.

The only thing that commends itself just now as worthy of serious consideration is one or other of the photo-mechanical processes. At the present time it is the fashion to mount photographs after the manner of engravings—India tints, plate marking, &c.—yet, withal, the pictures, except perhaps in the case of platinotypes, look very unlike engravings. Is there any reason, however, why veritable photogravure portraits should not be supplied by high-class photographers? For small numbers they would, undoubtedly, be more costly than silver prints; but, in the case of, say, two or three dozen, they would probably cost less, particularly when the expense of mounting is taken into consideration, and they would certainly command a much higher price. Of course, in throwing out this suggestion, we are supposing that the photographer will

make his own engraved plates. He can then either print from them himself, or get that part of the work executed by a regular copper-plate printer.

Photogravure is not by any means a difficult process to work, though it requires to be learnt and its little peculiarities surmounted, but they are really not so formidable as many surmise. Some amateurs have achieved great success with the process, and, if amateurs are so successful, why should not the more intelligent of the profession become equally so? The question must, however, be considered from a business point of view as to whether this style of picture would meet with greater favour with the more artistic and wealthier portion of the public than the present style of portraiture—silver and platinum prints for the orthodox album. If it did, there is no question that very much higher prices could be obtained than for even the highest-class ordinary photographs.

Photogravures would possibly not be quite so suitable for the present form of album as the every-day photograph, but the larger sizes would be far more suitable for framing, while the smaller ones could be bound up as an album, or they might be kept in a portfolio, with the convenience that several persons could be examining the different pictures at the same time. When once the copper plate is obtained, any number of prints of absolute uniformity can be printed at any time, night or day. An order for a dozen or two duplicates could be executed in an hour or less. Photogravure prints would, of course, have the additional advantage of absolute permanence, the same as veritable line engravings.

We have only alluded to photogravure as a mechanical process, but there is also the collotype process, which is an excellent one for portraiture when specially modified for the purpose and skilfully worked. Those who remember the excellent work produced in America, where it—the modified process—was vended as a "secret process" by the late Mr. Sarony Lambert, under the name of "artotype," know what the collotype process is capable of yielding in that direction.

The advantages of any of the mechanical processes are that prints in ink of any colour or tone, according to taste, can be obtained absolutely uniform. The suggestion for a higher class of work, here made, is not, we know, applicable to the improvement of the business of those who cater for the public at twelve or fifteen shillings a dozen for cabinets, and at a proportionately lower amount for *cartes*, but for the higher class of photographers, or those who wish to strike out on new lines which "cutters" are not likely to attempt.

The Giant's Causeway.—It is possible that the negatives that may be in existence of this wonderful natural phenomenon may become enhanced in value, seeing that the Syndicate which purchased it have gained the day in the case in the Dublin law courts, the Vice-Chancellor having decided that the public have not a right of way over the Causeway. Bodies of this kind have a happy knack of prohibiting photographing to any but a select few.

The Photographic Star Map.—It may be noted that for this great undertaking, which is progressing satisfactorily, it has been decided to reproduce the prints by a process of photogravure on copper. To prevent any possible loss through accident to an original negative, two glass transparencies (by contact) from each negative are to be made, one set of which will be preserved in the building at Breteuil, part of the Bureau International des Poids et Mesures.

Lens-testing at Kew.—The popular estimation in which the Kew system of testing scientific instruments is held is well shown by the large number annually sent there. Thus 13,772 clinical and 4098 meteorological thermometers were sent there last year, with 113 aneroids, 455 binocular glasses, 374 hydrometers, &c. but, when we turn to photographic lenses, the tale is but a sorry one, 14 being the number representing the total amount of photographic instruments placed under scrutiny, a number exactly similar to that of the preceding year, 1895. We note that photographic paper for testing or registering purposes was sent to a large number of observatories on the Continent, to America, and other places.

Uranium Phosphorescence.—Professors Elstead and Gertel have published an interesting note on the invisible radiations from uranium salts, discovered by Becquerel. They confirm the latter's statements as to the physical properties of these rays, and the fact already published, that the salts may be kept in the dark for months without loss of the radiation power, the source of the energy being thus at present unknown. The uranium sulphate, and uranium and potassium sulphate, are photo-electrically inactive, and sunlight does not naturally increase the radiation. Aluminium, zinc, luminous paint, and fluor spar, do not emit dark radiations when light falls upon them, at any rate of sufficient power to impart electrical conductivity to the surrounding air.

Platinum Soluble in Nitric Acid.—One frequently alleged property of the image on platinotype paper is its unalterability when exposed to the action of any reagent but nitro-hydrochloric acid. Quite lately, however, at a meeting of the Chemical Society, it has been shown that, when platinum has been alloyed with silver, and the alloy placed in pure nitric acid—best at a specific gravity of 1·42—about one per cent. of the raw metal was dissolved. The effect has previously been described in Bloxam's *Chemistry*), and so high a proportion as from five to nine per cent. given for this solubility. It is believed that the new are the truer figures. These facts do not show any untrust-worthiness in the permanency of platinum pictures; but, if the presence of the iron always shown to exist in a platinotype print play the part of the metal in the alloys spoken of, it is evident that the general statement as to the insolubility of the image is not quite trustworthy.

The Electric Photographing of Coins, &c.—We have, on previous occasions, described the curious "photographs" obtained by passing Röntgen rays through gold coins, medals, and other metal objects laid upon a dry-plate film, the relievo image and inscriptions showing, though somewhat indistinctly, upon the developed plate. A thoroughly satisfactory explanation has not been offered; but, quite recently, at a meeting of the Physical Society, Mr. Rolls Appleyard described certain experiments he had made, which may throw quite a new light on the cause of these images. He placed leather, filter paper, &c., in the path of an electric current, the porous substance having a layer of mercury on each side. The result was the deposit of a film of mercury on the side of the material nearest to the positive pole. He then placed a gold coin between the folds of a piece of filter paper, and passed the electric current through the coin; a gold discolouration, which penetrated the folds of the paper, was produced. It is evident that, if any such particles were thrown off in the original coin experiments on a dry plate, it could very readily be seen that development would produce an image.

BY THE WAY.

It is about twelve months since a rather smart correspondent discovered—if not my identity—at least my calling. I had ventured to make some remarks with regard to the relative positions of the professional and the *quasi-amateur*, and had expressed the opinion that the former had no legal redress if the latter chose to poach on his ground, and straightway, by some mysteriously intuitive process, my critic discovered that I was, or must be, a *dealer*, "sitting on

two stools," as he described it. Now, owing to what I said last month on the subject of the "ring" of plate-makers, several equally clever and rather bitter critics are convinced that I am one of the obnoxious fraternity sailing under false colours, and one suggests that I am probably the instigator of the new movement.

It may possibly relieve many apparently disturbed minds if I say that, although I have been for many years a maker of plates and films of all sorts, in former years to a far greater extent than at present, I have never done so for profit, and can therefore have little interest in "rings," or terms, or discounts. I have made wet plates and dry plates—albumen, collodion, and gelatine plates in their turn. Plain, albumenised, collodion, and gelatine papers, as well as carbon tissue, have all had their day with me; but, although I have derived a vast amount of pleasure and some knowledge and experience from these labours, so far as I am aware, I never received a penny piece in return for them. It is doubtful, in fact, whether, taking into consideration the present price and quality of commercial preparations, I should not be very considerably in pocket now if those preparations had been available at the same prices thirty or forty years ago, though I doubt even then whether I should have altogether refrained from being a "maker."

Then, again, I am twitted with being "all at sea" in my allusion to the comparative price of Mr. Osmund R. Green's large plates, specimens of which are now on view at the Palace, and modern hand-camera plates. "You must be very much at sea in your ideas of prices if you think even now plates that size could be bought for half-a-crown a piece, and what about thirty years ago?" says one wiseacre. I am not aware that I suggested anything of the sort. I said, to quote the exact words, "*even at modern popular prices* it would cost over half-a-crown for the same area of sensitive surface as *one* of those plates contained." To any ordinarily intelligent mind the words I have italicised would seem sufficient to emphasise the fact that I knew the cost would then be far more; but, when the same correspondent, in the earlier part of his communication, charges me with the heinous offence of being a "plate-maker," he himself must have been quite aware that I was not ignorant of the present probable price of such sizes. But an angry man is usually illogical.

As a matter of fact, I dare say the glass alone would even now cost very much more than the sum named, unless the commonest window glass were employed—even then the every-day glazier would scarcely supply glass of that size, together with putty and labour, for anything like the money; but, when it is taken into account that negatives of that size absolutely necessitate the use of plate glass of fairly decent thickness, perhaps I should not be far wrong in setting the price of the glass alone down at 10*s.* or 12*s.* at the least. But that is the least part of the expense in working such plates, more especially to the careless or unskilful manipulator, because it can be used over and over again until a successful negative results; but what is the probable cost of each failure in materials? I never attempted to coat a plate larger than 18×16 with collodion, but that requires some little skill, and even then it is impossible to do it without some waste; but I should estimate that, for a 24×18 plate, fully a pint of collodion would have to be used, or, at any rate, poured on to the glass, to get an even and satisfactory coating, and, if emulsion were used, perhaps even more. Only those who remember their early attempts at collodionising *small* plates can imagine what the handling of these larger sizes means, and they will possibly realise that the quantity of collodion *used* is not exactly represented by that which actually goes to form the film.

Then, with silver nitrate at four shillings or four and sixpence an ounce, as it was in the days when those negatives were taken, let the modern amateur try and estimate the amount of capital that would have to be sunk in making a silver bath of sufficient volume, and let him also realise that, even with the most scrupulous care in draining and otherwise manipulating plates of such large dimensions, the inevitable loss of solution is very considerable, so that, without reckoning at all for failures, the initial cost of successful negatives is proportionately far larger than in the case of small ones, and with the particular size referred to would not, I dare say, fall far short of a sovereign. But if the exposure is wrong, or the wind moves the trees, or a hundred-and-one other little unavoidable accidents happen, as the Scotchman said, "bang goes" not "saxpence," but probably half a sovereign, from no fault of the manipulator. So that it will be easily seen that in those good—or bad—old days there was every inducement to carefulness, especially in working large plates. Yet, strange as it may seem, large sizes were then far more in vogue than they are now, and small plates—quarter-plates, at any rate—were practically unknown except for portraiture.

If we look into the matter a little, however, the apparent strangeness disappears, for, under the circumstances, a far greater amount of trouble devolved upon the operator, whether professional or amateur, than at the present day. To the professional "it was all in his day's work;" if he had to take a 12×10 picture, he simply had to, and there was an end of it. To the amateur it was another matter; he went in for the thing for pleasure, and, if he had to go to a certain amount of trouble, he naturally felt that he might as well have something respectable to show for it. It was no use sitting up half the night, or perhaps half of two or three nights, to prepare his plates, if he happened to be a "dry" man, or, if he was "wet," to drag about with him for miles a tent and all the paraphernalia of the dark room, and have nothing to show for it but a few pictures that required a magnifying-glass to look at them.

In those days, enlarging, except by means of the solar camera, was practically impossible, and the lantern was, as compared with to-day, comparatively little used, so that there was no *raison-d'être* for quarter-plates, and even the half-plate was almost solely used for portraits. The smallest plate commonly used by amateurs was the stereoscopic, the old $6\frac{3}{4} \times 3\frac{1}{4}$, but even this did not satisfy the majority, for they mostly employed one or other of the sizes, such as $7\frac{1}{4} \times 4\frac{1}{2}$, $7\frac{1}{2} \times 5$, or 8×5, that enabled them to take either "stereo," or single pictures at will. These were the small sizes, with which may even be included whole-plate; but the average amateur, who could afford it—and, mind you, in those days the question of cost was an important one right through—generally affected at least a 10×8. A very popular size that has now almost disappeared was 11×9, the great beauty of which was that a sheet of paper cut into four prints without waste, whereas, with 12×10, unless a smaller size was also used, nearly half the sheet was wasted, for there were no "cut sheets" or "shilling packets" in those days.

When paper negatives were in vogue, the sizes "ran" even larger, and 15×12 was a very favourite size, for the amateur could carry with him on tour, without inconvenience, a far larger quantity of material than would have been possible with glass plates, while the apparatus itself could also be of a lighter description. Up to a dozen or so years back, the old-fashioned, all-wood, folding cameras used in the paper-negative days were frequent and familiar objects at Stevens's sales, and really, for large sizes, are little inferior in weight and portability to the best modern instruments. They folded into flat packages for travelling, not greatly exceeding the dimensions of a *bulky* sketching portfolio, and a 15×12 camera and plentiful stock of prepared papers could easily be carried on a walking tour, which is more than can be said for modern cameras and glass plates. The lens was the chief trouble, for that would not fold, though many ingenious devices were adopted for compressing it into the smallest space possible. Still the ordinary, single-lens doublets were practically unknown, in plain, rigid mounts, for 15×12 pictures, and occupied a solid-leather carrying case not much smaller than a hatbox.

The amateur photographer of the last generation suited himself, in fact, to circumstances, as does his successor of to-day; but it is a case of *autres temps, autres mœurs*. He was, of necessity, compelled to take a large amount of trouble, and he made the best return he could. Nowadays, if he wanted 15×12 pictures for framing, he would take a quarter-plate "hand-and-stand" camera, and enlarge his negatives after he got home; but, as that course was not open to him, he did the best he could, and took them direct. But if the modern amateur had to do the same, as the Irishman would say, "he wouldn't;" he would prefer to let it alone altogether in the majority of cases; in

fact, if things were now as they were then, amateur photographers would be as few as they were thirty and forty years ago. I have not the least doubt there is quite as large a number now who would willingly go to the same amount of trouble as of old if they had to, but it is against reason to expect any larger proportion to do so, or that, with improved facilities for working, they should put themselves out of the way to revert to old customs. We are rather apt to run down the crowd of modern amateurs, because things are cut out so much more easily for them, but perhaps there are just as many in the ranks now who would remain there if the old order of things were restored.

There is one thing that has entirely disappeared with the new *régime*, and that is the old *camaraderie* that existed amongst amateurs of the camera. I am not alluding to or forgetting conventions and outdoor meetings of one sort and another; that is an entirely new phase of sociability, entirely begotten of the changed state of affairs. But nowadays, if two amateurs, strangers, meet by accident, they rather shun one another. It is not much to be wondered at, for, if you had to be hail-fellow-well-met with every carrier of a camera stand you met, you might as well stop and shake hands with every cyclist you met, on the off chance of finding him sociable and congenial. In the old days, the sight of a camera stand was *primâ-facie* evidence of congeniality of temperament, and many a long-standing friendship has been formed in that chance manner by others as well as by

DOGBERRY.

PHOTOGRAPHIC LITERATURE UP TO DATE.

I HAVE been travelling for some time with a Japanese companion, who is interested in matters European, and who tries to make his knowledge as great as may be by studious reading. I found him one day poring over an octavo of goodly thickness in a binding of brilliant red. Curiosity induced me to look into this volume at a time when the owner was not reading it. I found the title to be:

———'S

COMPLETE BOOK OF SPORTS

AND

PASTIMES.

BEING A COMPENDIUM OF OUT-DOOR AND IN-DOOR AMUSEMENTS.

With more than 900 *Illustrations.*

———& COMPANY LIMITED.

1893.

ALL RIGHTS RESERVED.

I have left the name of the company blank here, because I have a healthy dread of the English law of libel, but I have written the name in the margin, and, if the editor cares to print it as a foot note on his own responsibility, I shall be more than glad.

The book consists of 975 pages, clearly printed, but on poor paper. It is profusely illustrated with woodcuts, in many cases fairly good, and I am quite willing to allow the "900" without actual counting. The book had been bought in Tokyo for a price corresponding very nearly to three shillings, and so far as paper, printing, illustrating, and binding are concerned, it is certainly cheap at the price; but, when we look beyond these four items, doubts arise.

It came as something in its way refreshing to find a deal that I remember to have read thirty and odd years ago in *The Boy's Own Book* and other excellent publications of a similar name and intent, and it is also only fair to say that some of the pages show internal evidence of revision and addition as late as the year 1891.

I not unnaturally looked for "Photography" in the index, as likely to be included under the head of "Pastimes," and sure enough it was there; but what a photography for the year of grace 1893! Two pages are given to the subject, and it is worth the necessary space, I think, to quote nearly the whole of the matter as showing what can be printed as modern photography in a "Complete Book of——Pastimes," still only four years old.

The first heading is:—

"CHEMICAL ACTION OF LIGHT ON COMPOUNDS OF SILVER."

Then there follows:—

"Light has a peculiar effect upon silver compounds, turning their colour in a very short time. If, for example, you make chloride of silver, by adding a solution of common salt to a solution of nitrate of silver, you will find that the chloride, which appears white upon being first made, becomes, *in the course of a day or two*,* of a purplish tint. *The iodide of silver is similarly acted upon* . . . . the photographer . . . . places a very thin film of a compound of silver (the iodide) on a glass plate, and then places this in a camera for a picture to fall on it."

We are now told how, "after an extremely short exposure," development is performed in the dark room with "a mixture of copperas and acetic acid, in distilled water." No quantities are given, and there is no word about intensification or redevelopment, but we are informed that the image must be fixed, "that is, so dealt with that it is invulnerable to the further assaults of light."

Then we find that "suppose the photographer had taken your likeness, and brought it to you at this stage, you would probably be surprised to find yourself appearing on the glass plate like a grey-headed negro . . . . because . . . . your skin seems dark, and your black hair white; in fact, things seem just the contrary from what they are, and the image is therefore called a *negative*."†

Next we are assured that "a picture representing you as you are is termed a 'positive,'" and that you get the same positive by an operation called "printing." The author has the words "positive" and "printing" both between inverted commas as though they were quite outside the vocabulary of the multitude.

"A sheet of paper, with chloride of silver in it, is placed in a frame, and the negative is fastened over it," and so on——a very vague description of the actual printing being given. Nothing is said about toning, but our authority tells us that

"This positive picture on the paper has to be fixed, or protected from the further action of light; that is, any chloride of silver, which might still be further coloured by the action of light, so as to mar the picture, must be now removed; and this is done by dissolving it away with a solution of hyposulphite of soda."

The second heading is:—

"IN THE PHOTOGRAPHER'S STUDIO."

and under this there is a sample of "modern photography" that can give odds to what is printed under the first heading. It is so good that it has to be given almost in full.

"We shall suppose that you have the privilege of walking about the photographer's workshop, of watching him in all his operations, and listening to his explanations. You will now understand his remarks about negatives, positives, printing, fixing and so on, as you stand in his operating room." [Happy youth to understand with such meagre information—but then you understand only "as you stand in his operating room!"] "He takes a photograph while you are there" (wonderful and excellent man), 'and you innocently ask him whether you could not manage to take a photograph with your *camera obscura*.‡ He smiles and says, 'No;' for, while his own camera (fig.—) is essentially the same in principle, it throws a practically *perfect** image on the screen at——"

Here, then, is given an illustration of a camera of the ancient box kind without either rack or screw for focussing, and fitted with the old time portrait lens with metal cap. I am old enough to remember my grandfather using a less antiquated form of camera in working Talbot's waxed-paper process. To continue:—

"In the tube at——there are a couple of lenses instead of one, as in your camera, and each of these is of a compound nature, to get rid of the colour defect we mentioned before . . . . . you will, therefore, understand that the photographer's camera is rather a dear piece of apparatus."

It is to be hoped that the smile of the photographer was "bland;" his remarks about a "perfect image," and so forth, are certainly childlike—or rather, perhaps, childish. There is something charmingly naïve in the statement that "you will, therefore, understand that the photographer's camera is a dear piece of apparatus." Continuing:—

"While he is making these observations he points the lens at —— towards the object, and while looking at the ground-glass screen at——, he turns the screw (the milled head of the pinion of the lens is meant) until the picture cast upon the screen seems, in his eyes, perfect. The cap is now placed over the lens at ——, the ground glass is withdrawn, and a *dark wooden frame*, containing the sensitive plate, is put in its place. The cap is now removed from the lens, and the borrowed light coming from

* The italics here, and farther on, are mine, unless it is stated that they are in the original.—W. K. B.

† Italics not mine in this case. It is to be noted that the article is written only for those who have "black hair." My own hair is not black, and this fact may possibly account for lack of appreciation of the matter that I am quoting.

‡ Italics in the great original.—W. K. B.

the object imprints itself on the film of iodide of silver on the plate in a few moments, and now the cap is replaced. Let us inquire into the history of this sensitive plate before it is placed in the camera and after it is taken out."

We learn that "it was first a plate of glass without anything on it save dirt," and are told how it has to be cleaned and coated with a "substance called 'iodised collodion,'" and then, "upon dipping it into a bath of nitrate of silver, the film became impregnated with the sensitive iodide of silver, and was then placed in the *dark frame*."

There is an illustration here of the flowing of a plate with collodion poured from a bottle of a shape that I have never seen any where but in Japan, where it is used for dispensing the national beverage *sakĕ*.

"And now for the history of the plate after exposure. The photographer carefully carries it back in the dark *frame* to a small room lit up only by red or yellow light, and there a developing solution is poured over it. There are a great many of these developing solutions, the solution of copperas in distilled water and acetic acid being one of them. The image on the plate now comes out, and is washed, and then fixed *by placing in a dish* containing a solution of cyanide of potassium; it is now coated with a very thin covering of *copal* varnish, and when dry is ready for the operation of printing." (Here comes a very fair illustration of the loose style of printing frame with plate-glass front). "The future history of the negative plate is, therefore, now one of repeated use for obtaining positives. It is placed in a frame with the film side in close contact with paper which has been impregnated with chloride of silver, while the other side of the glass is freely exposed to light. The daylight passes through the glass negative to the sensitive paper, where the *pattern* is reversed, and everything appears *natural*" (where is Dr. Emerson with his *Naturalistic Photography* now? how unnecessary was his great work when the whole subject can be disposed of in a single sentence!); "and now the last operation is to take the paper and *place it, picture side downwards, on the surface of a solution of hyposulphite of soda*, which dissolves the unused chloride of silver. *The picture is then mounted.*"

Now, this is too bad for the year 1893. In fact, it won't do at all. At first I imagined that the publication must be a reproduction by a Japanese printer from some ancient book, the date only being altered, for I am sorry to say that some Japanese publishing houses are not above this sort of thing; but there is evidence that it is not so. To begin with, some part of the book has been written about 1891, and, besides this, it has a freedom from printers' errors that is not to be found in the case of any book printed in English by a Japanese publisher. Is it possible that the publishers only send the book to Japan and other places in the "Far East?" If so, the more room for surprise.

W. K. Burton.

PHOTOGRAPHIC WORKERS AT WORK.

XV.—Messrs. J. Bulbeck & Co., at 167, Strand, W.C.

Although only recent entrants into the photographic field, Messrs. Bulbeck have made a very favourable reputation for architectural photography. For several years Mr. Bulbeck's leisure time has been devoted to photography, and, in addition to the knowledge thus gained, he brings to bear long business experience, and is thus well qualified to win for his firm a foremost place in the branches of photographic work they have addressed themselves specially to cultivate—namely, high-class technical and architectural photography. Mr. John H. Avery, whose skill as a photographer of architectural subjects is widely known and recognised, is associated with the firm, whose excellent views of the English Cathedrals, many of which are familiar to exhibition-goers, have brought them many successes in open competition.

The firm's premises, situated in the Strand, include a series of well-lighted rooms, which have been fitted up at great expense, with the laudable object of securing the best possible equipment for the work. The dark room is a veritable photographic luxury. An electrically driven fan controls the condition of the atmosphere, so that it is possible for even prolonged development with ammonia to be conducted without inconvenience to the operator. The hot-water heating apparatus is so designed as to admit of the temperature of the room being maintained at a fixed point—an obvious convenience, seeing how important it is that the various solutions employed in the manipulation of gelatine plates should be used at a uniform temperature. Among other useful features of this model dark room—which is replete with many other devices calculated to render development easy and comfortable—we noted that by actuating electrical switches the light in the non-actinic lamps can at will be directed down from overhead on to the plate, or from the usual position facing the operator—a manifest advantage in developing work.

In what might be termed the general workroom is contained what should prove of great convenience, viz., a species of portable geyser, yielding a constant supply of hot water at a fixed temperature, viz., 200° about. This ingenious piece of apparatus utilises gas as the source of heat, and is so constructed that, when a supply of hot water is drawn off, an equivalent quantity of cold is at once heated to take its place, and the adjustment of the flame is such that the temperature of the water does not rise above the degree for which the apparatus has been set, the gas being automatically cut off when once such temperature has been attained. Consequently, except at the times when hot water is actually drawn off, the consumption of gas is very small, and is practically a negligeable quantity. It can be easily understood that in a photographic *atelier* a variety of cases must arise where a constant supply of hot water at a uniform temperature is serviceable.

In this room are stored a large collection of mounted and unmounted architectural photographs, and we had opportunity of noting that Mr. Bulbeck is very rigid and strict in weeding out those prints which he considers do not come up to the high standard of quality he has set for himself. This is assuredly a right principle to initiate. By the aid of a negative ledger and numbered storage boxes a negative is easily traced. With regard to the storage of negatives we learned of a very common-sense plan which Mr. Bulbeck has initiated; this is, when the negative has been either tested to have the proper printing qualities, or, in case of need, judiciously treated so as to improve it up to the necessary point, it is bound up with a sheet of plain glass, and thus it stands ever afterwards "complete" for printing purposes, and requires no further treatment to fit it for doing duty in the printing frame.

It would take up more space than we could afford to describe the fine outfit of photographic apparatus with which Messrs. Bulbeck have provided themselves; but in the studio, where copying, reducing, and direct photography of objects is undertaken, we saw a number of specially built cameras, which in completeness of movement could not perhaps be excelled. The firm's lenses, chiefly of Zeiss's and Goerz' make, constitute a splendid collection in themselves; they are neatly placed and kept in a large and handsome glass case. The incandescent electric light, on Messrs. Adamson's system, as also a pair of powerful arc lamps, is available, and for photographing shop-window specimens, apparently *in situ*, means are at hand for erecting an imitation window in which the objects can be placed, so that the resulting photograph shall appear as if the articles had been directly taken in position. On the whole, it would be difficult to point out in what direction Messrs. Bulbeck had failed to provide themselves with the best facilities for producing the highest class of work.

FOREIGN NEWS AND NOTES.

Sulphur Toning.—A writer in the *Photographisches Centralblatt* points out that, with many of the collodion and gelatine papers, very fine brownish tones may be obtained without any toning, and this particularly applies to the matt-surface paper. Of course, when the paper is not washed, immersion in the fixing bath gives rise to sulphur toning, and the writer states that the silver sulphide thus formed is stable to atmospheric influence. It will be remembered, of course, that Bothamley has pointed out that the silver salt formed by the action of decomposing hypo is more probably silver subsulphide, which is not stable. However, the author suggests careful washing of the prints to remove the acid in order that sulphur toning shall not take place, and yet he recommends placing the prints into an acid fixing bath, such as is used for negative work, composed of hypo, sulphite, sulphuric acid, and chrome alum, as was originally suggested. As to the permanency of such images, there must be considerable doubt, notwithstanding the statement of the author that he has kept them for two years.

Permanent Prints.—Hans Schmidt, writing in the *Photographische Mittheilungen*, advances the statement that the only correct way of washing prints is in rain water, and that repeated soaking and changing of the water, as generally recommended, is useless. The Editor of the *Photographische Centralblatt* states that he does not agree with this, and further states that prints washed by the latter method, which he has always used, are permanent, at least, plates which were thus treated 18 years ago are perfect, as are also albumen prints washed in this way thirty-five years ago. Messrs. Haddon and Grundy have also proved by their researches that the method of constant change of water is quite as efficient as any other.

Three-Colour Printing.—Herr Angerer, of the well-known firm of Angerer & Göschl, contributes to Eder's *Jahrbuch* a short note upon this subject, in which he states that in his opinion the three-colour process is a pretty theoretical problem, but that it is not a practical process, because it is not possible to obtain absolute register of the three images; and, further, it is impossible to obtain pure greys and blacks, especially in long runs, as the amount of the inks varies to some extent in the pulls, and we therefore get those violet or green-tinted blacks with which all are familiar in three-colour work. He states that to attain the best results it is necessary to use a fourth printing plate, which shall give the blacks in the picture, and also of the black title or letterpress underneath.

Direct Photo-lithography.—Herr Fritz describes the following method of printing direct on to a stone. Good even stones, without chalky or ferruginous spots, should be chosen, and well polished, and then gently heated and flowed over with lukewarm water. The sensitive mixture is composed of 100 parts of good Cologne glue, which should be allowed to swell for twelve hours in water, and then melted in a water bath, and to this should be added a solution of 6 parts of dried egg albumen in 60 parts of water. To every 60 parts of this mixture should be added 500 parts of water, and 6 parts of a ten per cent. solution of ammonium bichromate, and then the whole filtered. The warmed stone is coated with this mixture in the dark room, then whirled till it is quite dry. The exposure is, according to the density of the negative, for from $\frac{1}{2}$ to 2 minutes in the sun, or from 5 to 10 minutes in the shade. After exposure, the stone is inked up with a mixture of 20 parts of Venice turpentine, 20 parts of litho ink, 5 parts of asphalt, and 3 parts of yellow wax. These ingredients should be rubbed up together, melted on the fire, and diluted with turpentine to a syrupy consistence. This mixture is spread over the whole of the stone with a soft pad, the stone then laid in water, and the parts not affected by light will soon begin to dissolve off, and it may be fully developed with a tuft of cotton-wool; then the stone should be gummed and allowed to dry spontaneously. It may be afterwards treated with water, etched, and will stand all the necessary and usual operations for preparing a perfect stone.

Stripping Films.—In Eder's *Jahrbuch*, Obernetter suggests the following method of stripping negatives with the aid of formalin. A mixture of 50 parts of formalin and 300 parts of water is made, and in this old negatives are bathed for from six to ten minutes, whilst freshly developed negatives only require from three to five minutes, after which time they should be well rinsed, and then either dried, or else, whilst still damp, coated with a solution of 200 parts of hard gelatine, which should be allowed to swell for twenty minutes in cold water, well pressed, and dissolved by heat in 1000 parts of water. When dissolved, 100 parts of alcohol, 20 parts of glycerine, and 20 parts of glacial acetic acid should be added. The negative should be coated to a depth of about one-twelfth to one-eighth of an inch with this solution on a levelled stand, and allowed to thoroughly dry, and then the edges cut round, and placed in a mixture of 50 parts of glycerine, 500 parts of alcohol, and 1200 parts of water, when it will soon begin to frill, and it may be stripped and transferred to another sheet of glass, or else used as a film negative.

Aluminium in Photo-mechanical Work.—Kampmann points out that pure aluminium may be used for photo-mechanical work, and may well replace the more troublesome copper, zinc, and the lithographic stone. After many experiments, it has also been used with advantage for casting type, and that an addition of from five to fifteen per cent. confers a longer life on the type. As aluminium is not so readily attacked by acids as copper and zinc, the ordinary methods of photo-mechanical etching cannot be followed, but metallic chlorides, such as cupric and platinic, may be successfully used for line blocks. For intaglio printing, it is not quite so suitable as copper, in that it will not take quite such a high glaze, but that it may be used as a substitute for the stone in lithographic printing, and it acts infinitely better than zinc, and may also be used as a support for a collotype film. A process has been patented in Austria, under the title of Algraphie, in which aluminium is entirely used for the reproduction of maps, &c.

A Grainless Emulsion.—MM. August and Louis Lumière contribute to Eder's *Jahrbuch* a paper on this subject, with special reference to Lippmann's process, and further researches have proved that their original method, suggested in 1892, is satisfactory, the great point in it being the admixture of gelatine both with the silver and the bromide solution, and the use of these in a very weak solution. The formula they recommend is as follows:—

A.

Water	200 parts.
Gelatine	10 „
Potassium bromide	3·5 „

B.

Water	200 parts.
Gelatine	10 „
Silver nitrate	5 „

The temperature of the solutions must not exceed 40° C. A sheet of glass should be coated with the above emulsion, laid on a slab of marble to set, and then dipped in alcohol, and the plate washed and dried. In order to increase the sensitiveness of such plates, MM. Lumière state that Valenta's method of using sodium sulphite has not succeeded in their hands, but suggest the bathing of the plate in a half per cent. solution of silver nitrate, to which acetic acid has been added. The plates should then be dried and allowed to remain for some hours at a temperature of 25° C., during which time an increased sensitiveness equal to sixty times often ensues. The plate must again be washed and dried. Formic acid may be used instead of the acetic acid, but it is rather more difficult to control. For Lippmann's process it is, of course, necessary to add some dyes, such as erythrosine, cyanine, or methyl violet, to increase the colour sensitiveness.

Devils.—Dr. G. Aarland, of the Photographic Department of the KK. Kunstakademie of Leipzig, commenting upon the occurrence of devils in photogravure, states that they have been able to make them at will, even when using the same copper, the same gravure, or carbon tissue, and it was noticed that, when the etching was prolonged, the devils appeared first in the blacks, and in those places where the gelatine film was thinnest, and extra dense pigment images were prone to cause them. He also states, as one of the most frequent causes, insufficient melting of the grain.

ON THE AVOIDANCE OF REFLECTIONS.

III.

In previous articles I endeavoured to point out some of the chief sources of annoyance from reflections when dealing with numerous articles that were situated in positions indoors.

There are, however, numberless cases when photographing in outside situations, also where reflections cause no little trouble to overcome. To many workers who merely expose a few plates now and again this statement may at first sight appear somewhat unfounded. Nevertheless, to the professional worker who has to undertake all kinds of work, a great amount of which very possibly may eventually have to be enlarged to an extreme size, the annoyance of having to deal with these troublesome visitors is very great indeed, and as a general rule, when dealing with such, an operator has not the same command over surrounding circumstances as is available when operating in inside situations.

One typical class of subjects may be mentioned to show the difficulty when dealing with certain kinds of subjects in outside situations. I refer to those highly glazed surfaces such as meet an operator face to face when photographing a fine example of a locomotive engine.

In such a case everything will be certain to be spick and span, and the case of the engine shining in some parts like the highly groomed coat of a "Derby winner." These enamelled surfaces (for they are virtually such after the several coats of paint they receive) have to be very carefully treated. Any one who for the first time attempts to photograph a newly-run out locomotive would, no doubt, think that but little or no thought was required to accomplish the job quite easily, and very likely plates would be exposed without his untrained eye noticing one or two very important points that make their appearance in a very unpleasant manner after the plate is developed and been placed out to print.

One fruitful source of failure in this kind of work emanates from the reflections on the top of the boiler casing, the results showing a snow-white appearance on the top of the engine, and leaving a mere ghost of a line where the outline of the locomotive verges into the sky in the background.

In nearly all machinery and engineering photography there is no doubt that blocking out enters largely into the final preparation of the negative before the same is in a fit condition to yield the most satisfactory results, and very much, no doubt, may be done by an expert worker to heighten certain portions of weak outlines; but no amount of blocking-out or "chemical treatment of retouching" will properly compensate for,

or get rid entirely of, this bald, snowy, whitewash appearance on the top of the boiler casing, unless proper precautions be taken to avoid the same before exposing the plate.

I have said that, when working in outside situations, an operater has not nearly so much command over his subjects, in so far as overcoming reflections, as he possesses inside. Still experience goes a long way in this matter, and it is just in work of this kind where a skilled outside operator shines to advantage over his brother, whose experience has been more or less confined to an entirely different class of work or training resulting in an entirely inside experience.

In these days of photographic impressionism any writer who has the courage to state his opinions, and to narrow the same down to any hard-and-fast lines when treating of the "lighting" of any particular class of outside subject, I am sorry to say runs a very strong chance of bringing down upon himself no end of criticism from those who can see no advantage in sunlight for landscape work, and many other specially recognised rules which were almost a *sine-quâ-non* in the good old days of collodion.

Nowadays an impression prevails that, with the extraordinary fast plates at command, the lighting of any subject in outside or inside situations is a matter of secondary consideration only, and that, under whatever conditions of lighting the plate be exposed, the results will be more or less a faithful impression of whatever appearance the subject presented at the moment of exposure; hence the straining after effects that, as a general rule, not one in a thousand ever saw or would care to see.

This sort of thing may be all very well to those who can afford to strain after special effects in certain kinds of outside subjects, but in commercial work no one can afford to ignore the lighting of his particular subject, and in dealing with machinery and locomotive work, perhaps more than in any other kind of photography, must the closest attention be paid to this matter; and not only must this be so in so far as regards the proper quality of light to use, but strict attention must be paid to the direction of lighting as well.

In many kinds of outside subjects sunlight is almost indispensable, but in the case of locomotive work, or where enamelled surfaces of varying forms are being dealt with, sunlight is, in my opinion, not the best class of lighting to employ.

With sunlight it is next to impossible to overcome very many forms of aggravated reflections as well as at the same time to bring out all the necessary details in dark corners before the strongly buried high lights are much overdone. With a pleasant subdued light, however, such as we get when the sun is obscured by some friendly but thin fleecy cloud, all this is changed, and quite a delightful equalisation of half-tone shadows and high lights appears.

In the matter of direction of lighting there is a great deal more than many might imagine, and the best results can only be achieved by carefully studying the effect according to the particular locality the locomotive occupies at the time. A low front light, *when the same is well* diffused and the background will permit of its being employed without detriment to the outline of the boiler casing, may be used to advantage. As a general rule, however, good results are obtained by working close up against the main direction of light; this will tend to bring out the outlines in bold relief against the blocked-out background, and help to overcome much of the glare or reflection that would be apparent by a strong side or front light.

The getting rid of the snowy-white appearance on the top of the boiler casing is the chief thing to overcome, and this can only be accomplished by a careful selection of the most suitable quality of light and the same being used from the best standpoint. T. N. Armstrong.

NIGHT PHOTOGRAPHY.

The first requisite, writes Mr. W. A. Fraser in *The Photographic Times*, is a strong weather-proof box camera. The one I use for this work is an old style Scovill detective, long ago laid on the shelf, but it struck me when thinking the matter over, that its strength and solidity, made it a very suitable instrument for this purpose, and much work done with it during the past winter has confirmed me in this opinion.

I carry a light folding tripod which can be quickly and easily attached to or detached from the camera, as working in the dark with hands numb from cold and wet, the simplest operation becomes a task, and the more simple the apparatus, the better the chance of success.

The lens I use is a Ross rapid symmetrical worked at full opening *f*-8. Mr. Paul Martin advises the use of a slow orthochromatic plate, but considering the good quality of the fast plates as now made, and the great advantage gained by reducing the time of exposure, an advantage which one will appreciate after a single trial, I very much prefer them, and results do not, in my opinion, suffer in the least from their use.

As halation must be guarded against, I adopted for this work the Seed non-halation plate, and back them as a further precaution.

Working on Mr. Martin's lines, I at first included in the exposure a minute or two of the last departing daylight, if it might so be called, but my negatives approached too nearly daylight results, and I have since waited until night has really fallen before making the exposure.

Having chosen the view and set up the camera, if the only lights included are gas lamps, the exposure with this lens and plate should be from eight to ten minutes, depending somewhat upon the distance to the nearest light, while, if any near electric lights are included, from two and one-half to three and one-half minutes will suffice.

When I speak of electric lights, I refer to those enclosed in opal shades, such as are used on Fifth and upper Madison Avenue in our city. Unprotected lights or those enclosed in plain glass shades I have never attempted, and doubt very much if they can be successfully photographed.

My moonlight pictures were taken between 10 and 11 o'clock, p.m., with moon almost full, and ten minutes' exposure.

During the exposure, a watch must be kept that no vehicle carrying lights crosses the field of view. My practice is to stand beside the camera, keeping one hand firmly on it, if it is blowing hard; several exposures I found were ruined through movement of the camera caused by the strong wind; then when a cab or other vehicle carrying a light enters the field of view, I, with the other hand, cover the lens until it has passed.

Moving objects not bearing lights makes no impression on the plate.

In the development I aim at softness, and use a rather weak metol developer, two ounces stock solution diluted with water to four ounces, and with very little, say two drachms alkali; no bromide.

The amount of detail picked up by the lens when using this plate, has been a constant source of wonder to me; in every case very much more than my eye could see was disclosed when the plate had been developed and fixed.

I prefer a stormy night for this work, either snow or rain, as the artistic effect is unquestionably much greater on these occasions.

Before starting out one's mind must be made up to bear with equanimity all sorts of chaff and uncomplimentary remarks, which are sure to be showered upon the photographer by the majority of the passers by. I have received a great deal of advice and sympathy concerning my mental make-up and condition, and if Robert Burns were still living, I should suggest to him that a trial of night photography might partially, at least, fulfil his wish as expressed in the lines—

"O would some power the giftie gie us
"To see oursels as ithers see us."

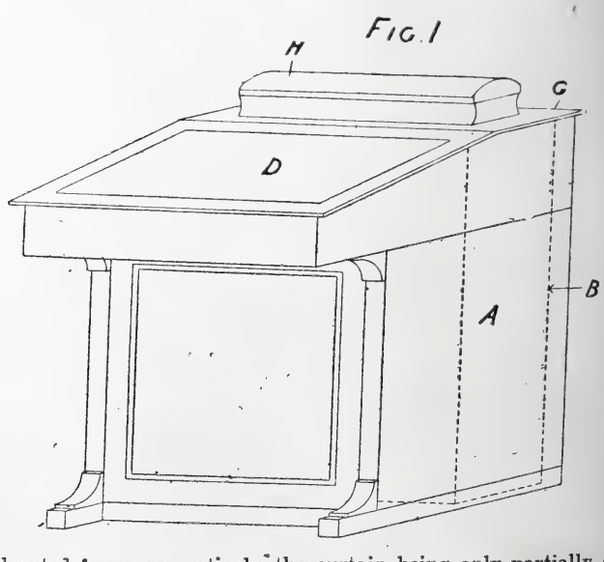
This is varied by a multitude of inquiries ranging from the sublime to the ridiculous, and also indication that an interest in science is abroad on the streets of New York, as I have more than once heard John explaining to Mary as they passed that I was taking a picture by those X rays the papers have been talking about.

One very stormy night towards the end of November, when making one of my earliest attempts, I was standing by my camera vainly (as it turned out) trying to get a bit which had pleased me, when I heard a voice outside my umbrella saying, "Say, mister, take my picture." On turning round I found it was my good friend, W. B. Post. Even he had not been able to resist the inclination to chaff a fellow-worker when he found him in what seemed a ridiculous position.

A COMBINED DEVELOPING CABINET AND WRITING DESK.

A combined developing cabinet and writing desk (which is the invention of Mr. W. T. P. Turner) is illustrated in the accompanying drawings.

Figs. 1 and 2 are perspective views of the cabinet in its collapsed



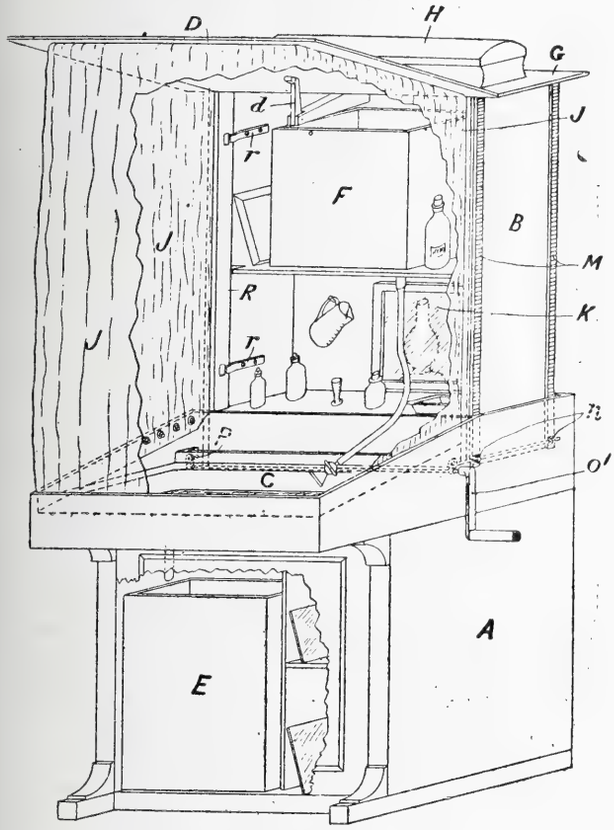
and elevated forms respectively, the curtain being only partially shown in the latter figure.

Fig. 3 is a part horizontal section on a larger scale to show the gear, and fig. 4 shows the lamp support.

Fig. 5 shows one of the detents used for supporting the cabinet when mechanical gear is not used for raising it.

A is the body portion, resembling an ordinary davenport writing desk, and B is an inner rising cabinet fitted to slide up and down within the rear part of the body portion of the davenport. The developing sink, C, is contained in the well beneath the writing slope, D, and discharges into a receptacle, E, contained in the lower front part of the body, A. The rising cabinet, B, is fitted with necessary shelves, racks, and other appur-

FIG. 2



tenances, and with a water cistern, F. The top, G, of the davenport body, A, is carried by the rising cabinet, B, and may be fitted with the usual receptacles, H, for writing materials closed by a hinged lid. The desk, D, which forms the cover of the well containing the sink, is hinged to the top, G, so that it rises with the cabinet, B, in order that it may serve as the top of a dark tent formed by curtains, J, attached to the desk. When thus used, the desk may be raised on its hinges, as shown in fig. 2, to afford the necessary height, and be supported by a hinged strut, *d*, carried by a bracket arm fixed to the top of the cabinet, B. The cabinet, B, is provided with a non-actinic window, K, in the back, and a shelf, L, is hinged so as to fold into the window aperture when the cabinet, B, is lowered, the shelf resting, when the cabinet is raised, on the top of the body portion, A, for the support of a lamp outside of the window, as shown in fig. 4.

The rising motion may be imparted to the cabinet, B, by mechanical means, preferably by pairs of racks, M M, at each end near the corners, and pairs of pinions, *n n*, gearing therewith, each pair of pinions, *n n*, being on a common shaft, N, suitably mounted within the end of the body portion, A, and the two shafts, N, being geared by worm wheels, P, with worms, *p*, on a shaft, O, extending along the front or rear side of the body portion, and turned for the purpose of raising and lowering the cabinet, B, by means of a removable winch handle, O^1. By thus coupling the gearing an easy and steady raising and lowering motion of the cabinet is ensured, the worm gear also supporting the cabinet when raised.

Instead of rack-and-pinion gear, as above described, the cabinet might be raised by vertical screw shafts mounted in each end of the body, A, geared together and worked from a single handle, the screws working through nuts on the ends of the cabinet, B; or the cabinet might be raised and lowered by cord gear, the cords being attached to the ends of the cabinet, B, at the lower part, passing over pulleys mounted on the inner faces of the ends of the body, A, and down to barrels on a common shaft extending from side to side of the body, A, at the lower part.

Instead of raising and lowering the cabinet by mechanical gear, it may be done directly by hand, in which case hinged stops or detents, Q (fig. 5), would be provided one at each end of the cabinet, the detents being fitted in recesses in the cabinet and adapted to be projected outwards by springs, *q*, so as to rest on the top of the body portion, A, and support the cabinet in the raised position, the detents being adapted to be easily pressed inwards by hand in order to lower the cabinet.

The curtains, J, are provided with the usual light-tight means of access to the interior, and, besides being fastened to the desk top, D, they are permanently fastened to the ends and front of the well containing the sink, and they are detachably fastened to the ends of the cabinet, B, in such a way as to exclude light. For this purpose the side edges of the curtains may be clipped between the ends of the cabinet and hinged flaps, R, pressed upon by springs, *r*, acting on flats, r^1 r^2, on the flaps so as to hold the flaps in either of two positions in the manner of a penknife joint, the curtains, when the cabinet is collapsed, being gathered up and stowed away in the recess of the sink.

RICHARD'S IMPROVED VIEW-FINDER.

"In photographic view-finders provided with a mirror placed at an angle of 45°, the picture," says M. Jules Richard, "presented to view, although apparently rectified, is still reversed as regards right and left, which renders it very difficult to follow a moving object.

"The present invention has for its object a system of double reflection, whereby the rectification as regards right and left is effected also, so that a perfectly rectified picture is presented to the retina.

"To obtain this result I have devised a special form of prism, in which the image, instead of being projected upon a plane surface, as in a total reflection prism, strikes upon two of its faces at right angles to each other.

"Fig. 1 represents a longitudinal section, fig. 2 a section on line 1–2, fig. 1 and fig. 3 a section on line 3–4 (fig. 1) of the view-finder.

"Fig. 4 shows the top and bottom sides of the prism.

"In the example which I have selected for the purpose of describing and illustrating one of the applications of my improved view-finder, I employ a prism whose four faces are inclined at certain angles to each other. Fig. 4, which represents the prism separately, shows that the vertical face, *a*, in the example illustrated is behind the lens, *l*, which receives the image to be viewed. The face, *b*, of the prism, which is horizontal and perpendicular to *a*, corresponds to the ground glass, *e*, shown in figs. 1 and 2, upon which the image is reflected. The two other faces, *c* and *d*, are inclined at angles of 45°, both to face, *a*, and to face, *b*, and meet at their long sides. The image, whose rays pass through the lens, *l*, is projected upon the faces, *c* and *d*, and by them reflected through the face, *b*, upon the ground-glass screen, whereon the image is viewed in its completely rectified position. As the two faces, *c*, *d*, of the prism act as mirrors

FIG. 3

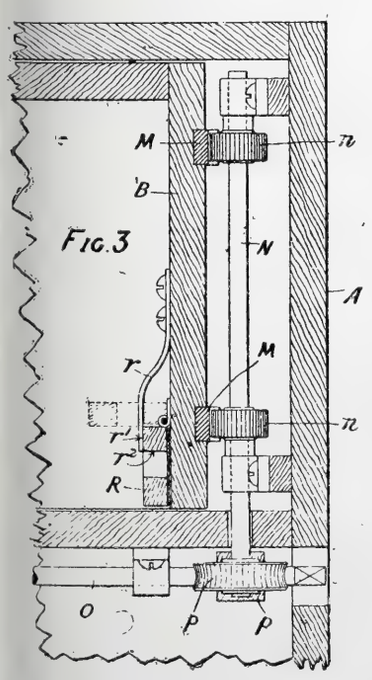


FIG. 5

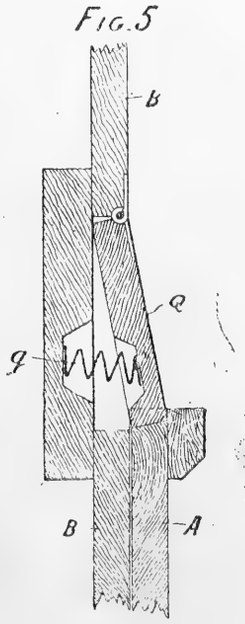
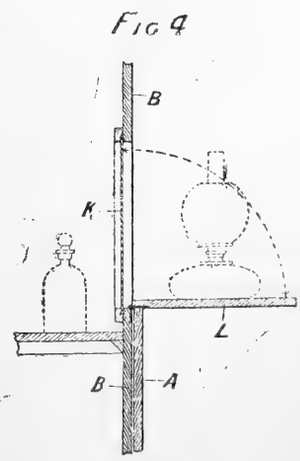


FIG. 4



similarly placed, double reflection is produced, which entirely rectifies the image, and reproduces it exactly as it appears to direct vision. In the prism described the image strikes upon two faces, *c*, *d*, which

FIG. 1.

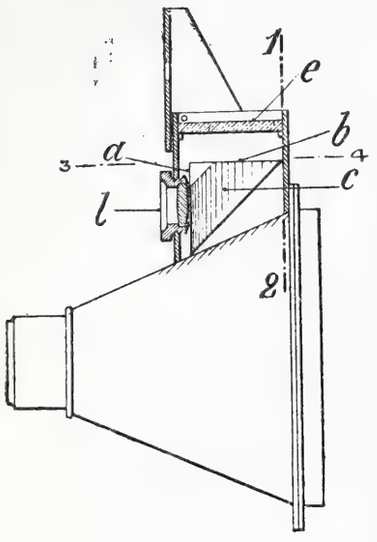


FIG. 2.

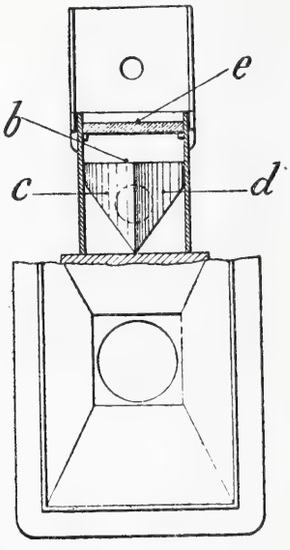


FIG. 3.

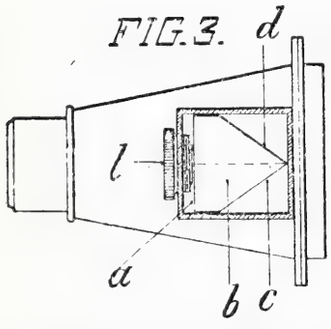
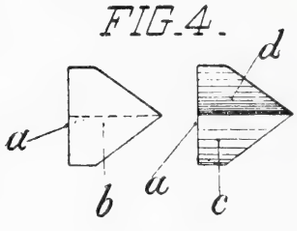


FIG. 4.



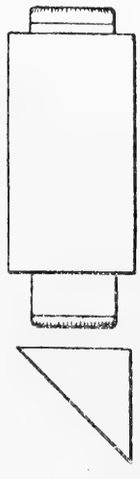
are at a right angle to each other, instead of upon a plane surface as in a total reflection prism.

"My system of prism may be applied in many kinds of existing optical apparatus, and I will instance one in which the image is obtained by means of two convex lenses, the first of which gives the true and virtual

FIG. 5.



FIG. 6.



image, and the second magnifies it. In this case, as in the camera, the image is inverted. By applying my system of prism, either in front or rear, or between the lenses, the above objection is avoided and a perfectly rectified image is obtained. My improvement can thus be applied to existing instruments without alteration, which is a great advantage, more especially for the reproduction of pictures, engravings, manuscripts, &c. Among other applications, fig. 5 represents the prism adapted to a spy-glass having two bi-convex lenses, and in fig. 6 as applied to a camera having two lenses.

"It is to be understood that mirrors mounted in positions corresponding to the two faces, *c d*, of the prism hereinbefore described may be substituted for the prism, and form a more economical means of obtaining the same result in cases where less precision is required."

PHOTOGRAPHIC EXPORTS.

COMPILED FROM THE CUSTOMS ENTRIES.

May, 1897.

	£		£		£
Aden	11	Brought forward	1801	Brought forward	£4140
Amsterdam	56	Durban	268	Rangoon	60
Antwerp	46	East London	22	Riga	106
Auckland	100	Flushing	284	Santander	13
Bombay	589	Foochow	30	Shanghai	172
Boulogne	169	Fremantle	200	Singapore	57
Brisbane	60	Ghent	60	St. Petersburg	286
Buenos Ayres	40	Hamburg	114	Stockholm	85
Calcutta	231	Hiogo	27	Sydney	678
Canterbury	67	Hong Kong	81	Teneriffe	5
Capetown	268	Madras	164	Trinidad	30
Christchurch	62	Melbourne	704	Wellington	23
Christiania	15	Otago	56	Yokohama	179
Colombo	56	Penang	5	Zanzibar	11
Constantinople	9	Perth	114		
Delagoa Bay	22	Port Elizabeth	210	Total	£5845
Carried forward	£1801	Carried forward	£4140		

May, 1896.

	£		£		£
Adelaide	£96	Brought forward	£1576	Brought forward	£3715
Akyab	20	East London	39	Penang	14
Alexandria	11	Flushing	443	Perth	48
Amsterdam	18	Fremantle	25	Port Elizabeth	26
Auckland	94	Ghent	384	Port Said	45
Bangkok	65	Hamburg	76	Santander	15
Beyrout	9	Hiogo	205	Shanghai	123
Bombay	461	Hobart	10	Singapore	74
Boulogne	92	Hong Kong	56	Stockholm	114
Brisbane	47	Kurrachee	52	Sydney	655
Buenos Ayres	32	Lisbon	114	Tientsin	42
Calcutta	167	Madras	50	Tokio	411
Canterbury	19	Malta	64	Trinidad	100
Cape Town	175	Manilla	21	Wellington	60
Christchurch	85	Melbourne	512	Yokohama	30
Colombo	98	Monte Video	28	Zanzibar	25
Constantinople	31	Ostend	37		
Durban	56	Otago	23	Total	£5497
Carried forward	£1576	Carried forward	£3715		

MEMBERSHIP OF THE ROYAL PHOTOGRAPHIC SOCIETY.

WE are constantly in receipt of questions as to the course to be taken to acquire membership of the Royal Photographic Society, and the advantages thereby gained. The following particulars, which appear in the current number of the Society's journal, supply the necessary information:—

"The Royal Photographic Society was founded in the year 1853, under the title of 'The Photographic Society of London,' which, in 1874, was changed to 'The Photographic Society of Great Britain,' and, in 1894, was further modified, by Her Majesty's commands, to 'The Royal Photographic Society of Great Britain.'

"The objects for which the Society was established may be summarised in the phrase, 'the advancement of photography.'

"Meetings for the reading and discussion of papers are held in the Society's rooms on the second, third, and fourth Tuesdays in each month, from October to June inclusive, those on the third Tuesdays being specially devoted to photo-mechanical processes.

"An Exhibition is arranged every autumn—for many years it has been held in Pall Mall—at which are included selected photographs of every kind, and new appliances.

"The Society's journal is published monthly, and includes abstracts of the most important photographic work throughout the world. The library of the Society consists of more than 12,000 volumes, and the museum is rapidly increasing in interest.

"The Society consists of three classes of members, namely, ordinary members, Fellows, and Honorary Fellows. Any one who is interested in either the science or the art of photography is eligible for election as an ordinary member. The Fellowship, on the contrary, is open only to

those members who are able to satisfy the Council that they have ability in one or other of the many branches of the subject, and they have a right to place the letters F.R.P.S. after their names, as an indication that their ability has been acknowledged by the Society.

"Members pay upon election an entrance fee of one guinea unless they have been members of an affiliated society for at least two years. An annual subscription of one guinea is payable by ordinary members, and two guineas by Fellows, and in both cases future subscriptions may be compounded for by a single payment of ten guineas or twenty guineas respectively; but members elected during the latter half of the year are liable for one guinea only, which is held to include both the entrance fee and the first year's subscription.

"Members have the right of attending all meetings of the Society, and of introducing two visitors to each; they have free admission to the Exhibitions of the Society, a number of tickets for their friends, and additional tickets that they may require at half price. No charge for wall space is made to members of the Society. They receive gratis all publications of the Society, have the free use of the dark room, library, and laboratory, as well as of numerous other dark rooms, in this country and abroad.

"For further particulars and forms of application for membership, address the Secretary, Royal Photographic Society, 12, Hanover-square, London, W."

EXHIBITION OF EAST ANGLIAN PHOTOGRAPHS AT THE CONVENTION.

The Council of the Photographic Convention of the United Kingdom, at the forthcoming meeting at Great Yarmouth, commencing on July 12, are desirous of getting together for exhibition a good collection of photographs, preferably those illustrating East Anglian scenery, architecture, &c. The Town Hall, in which the Exhibition will be held, is a noble building, and has been secured from July 12 to July 17 inclusive, and a very large gathering of Conventioners is expected.

No charge will be made for wall space for any such exhibits, and Mr. Frank H. Sayer, of 26, King-street, Great Yarmouth, and Mr. H. Harvey George, of The Tower, Gorleston, Great Yarmouth (the Local Hon. Secretary), will acknowledge all exhibits sent to their care at the Town Hall, Great Yarmouth, up to Friday, July 9.

Our Editorial Table.

Types of Naval Armament during Her Majesty's Reign.

Photographed by G. West & Son, Southsea.

From Messrs. West, the well-known naval and yachting photographers, we have received what they not inappropriately term a "mosaic" of over sixty photographs illustrative of the types of naval armament in vogue during Her Majesty's reign. The mosaic is of the size fifteen inches by ten, and consists of reduced photographs of wooden battleships and modern ironclads, selected with a view to afford at a glance an idea of the process of evolution in construction through which the navy has passed in the last sixty or seventy years. It should form a most interesting souvenir of the forthcoming Jubilee Naval Review.

The Infallible Hand Camera.

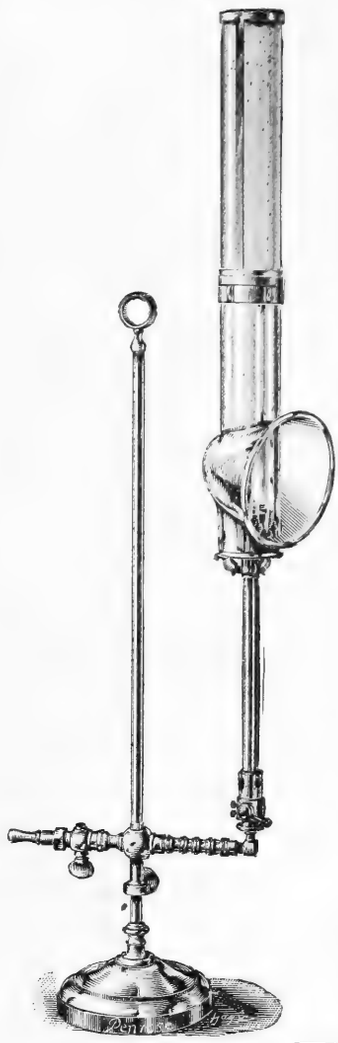
Thompson & Co., 4, Bull's Head-yard, Manchester.

Messrs. Thompson send us a little pamphlet descriptive of Mr. McKellen's "Infallible" hand camera, an extremely ingenious instrument, as we remarked when noticing it some months ago. The excellent changing principle of the camera is very fully described and illustrated, and there is much other matter of interest in the pamphlet.

Specimens of Metallic Printing.

The Metallic Photo-printing Company, Limes Avenue, New Southgate, N.

The above-named Company have placed before us some specimens of a process which is termed "metallic printing." The images of these pictures are in gold, silver, bronze, or other metallic powder, and are produced by a modification of the well-known powder process. They are then transferred to wood or similar plaques, and, after the application of a suitable varnish, are subjected to a degree of heat sufficient to fix the picture on to the support. The process may perhaps be roughly described as a method of photo-japanning. The examples before us are of great beauty, and we have no doubt that the process will be much appreciated for decorative and other purposes. One is a portrait in silver powder on apparently an ebonite plaque; the other, also a portrait, is in gold, on a similar support, with deep gold-bevelled edges. They have a most effective appearance when properly displayed in the home, and we should be surprised if they are not popular with photographers and their sitters. They are said to be quite permanent. The application of heat to the surface does not destroy it, while it is impervious to atmospheric influences.



Penrose's Improved Incandescent Gas Light.

Penrose & Co., 8, Upper Baker-street, W.C.

This modification of the incandescent gas light has for its object the securing of a more actinic light from the ordinary Welsbach burner and mantle, thus rendering the form of lighting suitable for small workers who do not require such an expensive installation as the electric light.

The improvements consist essentially in conveying a larger volume of air to the burner, in more perfectly mixing the gas and air, in securing full combustion by using a longer chimney, and in concentrating the light by means of a parabolic reflector.

Messrs. Penrose use the Welsbach C burner, with the usual mantle and chimney, so that those who already have burners of this pattern can have the improvements fitted thereto.

The burner can be attached to existing gas brackets, pedestals, or a table stand is supplied, as shown in the illustration.

The improved light has been thoroughly tested against the ordinary burner, and has shown a very marked advantage. It is recommended for copying on dry plates, enlarging, printing bromide and other development papers, lantern-slide and transparency-making, and all kinds of contact printing requiring a brilliant and constant light.

Die Kunst in der Photographie.

Julius Becker, Berlin, S.W.

Under this title a new periodical publication has been brought out by Franz Goerke. It is devoted to photography as an art, and its aim is to bring together a collection of pictures representing the finest work done by amateur photographers. It is published in folio form bi-monthly, and the parts will contain six to eight photogravures and other process prints. Each part will also contain a paper upon some topic of interest to the photographer from the artistic standpoint. Technical matters will be excluded. The present number contains a very interesting paper by Walther Körber on "Optical Illusions as an Aid to Composition," and many hints of value may be gathered from it as to the arrangement of lines in a picture to produce a desired effect. The photogravures are six in number, and mostly landscapes. A picture by Captain Böhmer, entitled *New Regulations*, is deserving of special mention. The publication is to be of cosmopolitan character, and merits success.

Special List of Backgrounds and Accessories.

Jonathan Fallowfield, 146, Charing Cross-road.

This special list takes the form of a little book of fifty-six pages, in which there are illustrations of over forty different kinds of backgrounds, very varied and effective in design. Tasteful accessories, plain backgrounds, and other articles of professional employment are also referred to. The list will, doubtless, be found useful by our professional readers.

We have also received from Mr. Fallowfield his list of dry plates, films, and printing papers; special spring novelty list; and the

illustrated prospectus of the stereo-photo-duplicon, a device for attachment to the lens of an ordinary camera, and which utilises the principle of reflection for obtaining binocular photographs by means of one lens.

News and Notes.

MESSRS. O. SICHEL & CO.'s Show-rooms have been removed from 47, Oxford-street, W., to more commodious premises, 20, Berners-street, Oxford-street, W.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, June 16, at eight o'clock. *Changing and Repacking Plates and Films when on Tour.*

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, June 15, at 12 Hanover-square, at eight p.m. *Photo-lithography*, by Mr. W. D. Richmond.

MR. R. T. WATKIN WILLIAMS has resigned the post of Hon. Secretary to the Camera Club. The Club journal remarks: "His tenure of office, though brief, has been one of marked success. Seldom, we think, has a better course of lectures been organized than the one arranged for the season that has just terminated. The cause of the late Hon. Secretary's resignation is matrimony."

SOCIETY OF ARTS CONVERSAZIONE.—The Society's *Conversazione* is fixed to take place at the South Kensington Museum (by permission of the Lords of the Committee of Council on Education) on Wednesday, June 16. The reception will be held by Major-General Sir Owen Tudor Burne, G.C.I.E., K.C.S.I., Chairman, and the members of the Council of the Society from nine to ten p.m. The only entrance to the Museum will be in the Cromwell-road.

"MOTHERS AND DAUGHTERS."—There is probably no monarch in the world who is so closely connected with other rulers as the Queen. So many and so varied are the relationships of our Royal Family, that most people, while convinced of the fact, have only a vague knowledge of the actual details. Recognising this, the proprietor of *Mothers and Daughters* is giving away a large chart showing the whole of the Queen's descendants, and the various inter-relationships of the Royal Houses of Europe so far as they are connected with our own Sovereign.

A DEED of assignment for the benefit of creditors has been executed by William Harvey Barber, photographer, The Studio, Bank-road, Matlock Bank, Matlock, under which he agrees to pay a composition of 6*s.* 8*d.* in the pound, by two equal instalments, on September 29, 1897, and March 25, 1898, with provision for reassignment of estate on payment of the composition. The trustee under the deed is Mr. Thomas H. Harrison, chartered accountant, The Wardwick, Derby. The unsecured liabilities are returned at 273*l.*, and the assets are returned at 100*l.*, after deducting the claims of preferential creditors payable in full.

RAPID PHOTOGRAPHY SYNDICATE, LIMITED.—This Company has been registered by Ashurst & Co., 17, Throgmorton-avenue, E.C., with a capital of 15,000*l.*, in 1*l.* shares. The object of the Company is to enter into an agreement with E. F. Mackusick and the Automatic Photograph Company, and an agreement with the North British Finance Association, Limited, and to carry on the business of photographers, sculptors, engravers, lithographers, printers, &c. The first directors (to number not less than three nor more than fifteen) are to be nominated by the subscribers. Qualification, 200 shares; remuneration, 100*l.* each per annum.

A CHANCERY ACTION.—In the Chancery Division of the High Court, Mr. Justice Sterling had before him the case of Koopmann *v.* The Manchester Palace Theatre of Varieties. An injunction had been granted, ex parte, on Friday, restraining the defendants from giving an entertainment under the name of the Biograph or the American Biogram, an invention of which the plaintiff claimed to be the inventor, and of which the instrument in question was an unauthorised adaptation. Mr. Henry Terrell, for the defendants, now asked for copies of the evidence on which the Judge had granted the injunction. His lordship directed copies of the evidence of the plaintiff to be furnished the defendant, and said the interim order granted would be continued over next Friday, by which time Mr. Terrell would be in a position to say whether he wished to contest the matter further. If this were not so, the case would go over to the first motion day in the next sittings.

THE EFFECT OF LIGHT ON MICRO-ORGANISMS.—It may be well to point out the very important fact, which has only recently been discovered, of the destructive effect of light on micro-organisms. There can be no doubt that, among the many and incalculably great services performed by the sun, is to be numbered the fact that we are not altogether obliterated from the face of the earth by the ubiquitous germ. Myriads of microbes are killed by the sun's rays; and, while many may not be actually killed, their properties are considerably modified. This has been found to be the case with certain disease germs, the malignant properties of which are considerably modified, if not indeed destroyed, by exposure to the sun's rays. Recent investigations have shown that the destructive action of sunlight is due to the violet and ultra-violet rays of the solar spectrum. The electric arc, which is rich in violet rays, also exercises a destructive effect, and, it may be interesting to add, the Röntgen rays likewise possess a destructive action. It has further been shown that the mode in which this destructive action is effected is due to the production of peroxide of hydrogen, which, as is well known, is a strong oxidising agent. Those micro-organisms which survive the action of sunlight, owe their immunity to the possession of a protective coloured skin, which effects the absorption of the violet rays. It is highly probable that most disease-producing germs are destroyed by sunlight. We know, at any rate, that this is the case with regard to those producing anthrax, typhus, and probably cholera. In exemplification of the destructive action of sunlight on the development of bacteria in media exposed to its action, it may be mentioned that in the surface water of the Thames the number of microbes present was decreased by about fifty per cent. through four and a half hours' exposure to the sun.—*Sanitary Record.*

EFFECT OF CHANGE IN TEMPERATURE ON PHOSPHORESCENT SUBSTANCES.—When a substance that possesses phosphorescent properties is exposed to suitable light vibrations, it is found to glow with a certain brightness when the light is shut off. When such substances are exposed under *similar conditions* for a sufficient length of time, the intensity of the phosphorescent light emitted reaches a maximum, which maximum is constant for each substance. If, now, the temperature of the substance under observation be altered, the other conditions remaining the same, it is found that the maximum intensity of the light emitted varies with the temperature, and that the maximum for any temperature is constant for that temperature. The light to which the substances under observation were exposed was that from a spark discharge of a Leyden jar coupled up with the terminals of an induction coil. The instant the spark is stopped, the intensity of the light emitted by the substance is estimated by a photometer devised for the purpose. The principle of the photometer consists in diminishing light that shines through an aperture of given area by interposing thin sheets of oil paper. A slip of glass is also interposed, of the same colour as the light emitted by the phosphorescent substance. As yet this photometer has only been used to compare the maximum intensity of the light emitted from the same substance at different temperatures. Now, let us suppose, for example, that with a specimen of calcium sulphide at −40° C., ten papers had to be interposed before the light emitted from the sulphide and that from the photometer were of equal intensity, while at 96° C. only seven papers had to be interposed. By taking the reciprocal of the antilog. of 10 and the reciprocal of the antilog. of 7, we have a rough measure of the relative intensity of the light emitted at −40° and +96° respectively. The antilogs. were plotted to scale, and from the curves thus obtained reciprocal curves, showing how the light emitted varies with the temperature were plotted.—RALPH CUSACK, in *Nature.*

Patent News.

THE following applications for Patents were made between May 26 and June 2, 1897:—

ANIMATED PHOTOGRAPHY.—No. 12,785. "Improved Apparatus for Photographing Objects in Motion and for Projecting the Representations upon a Screen or other surface." Communicated by W. Latham. C. A. DAY.

THREE-COLOUR NEGATIVES.—No. 12,826. "Improvements in Means of and Apparatus for Producing Three-colour Negatives." R. S. CLAY.

SPHEROMETERS.—No. 12,907. "Improvements in or relating to Spherometers and Instruments for Measuring the Curves of Lenses and other Curved Bodies." D. GENDROT.

PLATE AND FILM.—No. 12,922. "A New or Improved Sensitive Plate or Film, and a Method of Producing, Developing, Fixing, and Toning the same." T. C. PORTER.

MAGAZINES.—No. 13,048. "Improvements in Photographic Plate-changing Boxes or Magazine." A. E. B. CAYZER.

ANIMATED PHOTOGRAPHY.—No. 13,056. "Improvements in the Method of Arranging the Pictures on Animated Photograph Films, and in Apparatus for Operating such Films." C. W. BAXTER, C. WRAY, and J. OULTON.

ANIMATED PHOTOGRAPHY.—No. 13,124. "Improvements in or connected with Apparatus for Producing or Exposing Photographic and like Views (Animated)." W. S. SIMPSON.

ANIMATED PHOTOGRAPHY.—No. 13,163. "Improved Means and Appliances for Absorbing or Subduing Noise in connexion with Apparatus used for Displaying Photographic and like Views (Animated)." W. S. SIMPSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
12	Hackney	Excursion: Bricket Wood. Leader, J. Roland Smith.
14	Bradford Photo. Society	*A Mountaineering Experience.* Al. Keighley, F.R.P.S.
14	North Middlesex	
15	Aintree	Lecture: *At Home Subjects.*
15	Brixton and Clapham	*The Treatment of Figures.* Rev. F. Lambert, M.A.
15	Gospel Oak	Special Meeting of Society at Red Arch, Hampstead Heath, at eight o'clock.
15	Hackney	*Holiday Work.* W. Rawlings.
15	Leeds Photo. Society	Conversational Meeting.
15	Royal Photographic Society	*Photo-lithography.* W. D. Richmond.
16	Croydon Camera Club	Excursion: Charlwood. Leader, Hec. Maclean.
16	Photographic Club	Changing and Repacking Plates a. Films when on Tour.
17	London and Provincial	Open Night. Nomination of Officers.
17	Polytechnic	Show of Whitsuntide Work.
19	Aintree	Excursion: Gresford and Rosse. Leader, W. B. Hellon.
19	Ashton-under-Lyne	Excursion: Windermere.
19	Croydon Camera Club	Excursion: Leigh Mill and Tanrid. Leader, H. E. Holland.
19	Hackney	Excursion: Moulsey. Leader, T. President.
19	Oldham	Excursion: Monsal Dale. Lead. T. W. Hilton.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 8,—Ordinary Meeting,—Sir H. Trueman Wood, M.A. (Vice-President) in the chair.

EXHIBITION COMMITTEES.

The HON. SECRETARY announced the election of the following Committees in connexion with the forthcoming Exhibition at Pall Mall :—*Hanging Committee:* Messrs. F. P. Cembrano, J. Hodges, A. Mackie, Mummery, J. A. Sinclair, and W. Thomas. *Selecting Committee:* Mr. R. W. Craigie, Rev. H. C. Lambert, Messrs. E. J. Wall and J. B. B. Wellington, with the Hanging Committee and the Judges.

AFFILIATION.

The Dundee and East of Scotland Photographic Association was admitted to affiliation.

"PALMAM QUI MERUIT FERAT."

The HON. SECRETARY announced that the Hon. Fellowship of the Society had been conferred by the Council upon Professor Gabriel Lippmann.

PHOTOGRAPHIC SURVEYS.

Mr. C. J. FOWLER (Hon. Secretary of the Birmingham Photographic Society) read a paper giving particulars of the survey work already accomplished by that Society, and discussing in detail the conditions and requirements necessary to a complete and satisfactory photographic survey of a given area. He said the credit for reducing the scheme for a county survey to a practical and workable shape was due to Mr. W. J. Harrison, whose ideas, formulated in 1889, constituted the basis of the Warwickshire Survey, which was now being carried out. It was of the utmost importance that the business of a survey should be organized in a businesslike, methodical, and accurate manner, and that responsible officers, possessing those qualities, should be appointed to direct and control it, the co-operation of scientific, literary, and artistic societies being also invited. The Birmingham Society had adopted the six-inch Ordnance map as a basis of subdivision, each square of the map containing about six square miles, being regarded as a distinct field for one or two workers. It had been found almost impossible to induce a member to concentrate his attention upon the particular "square" allotted to him, and, while 'the man with a hobby" or special subject was generally to be encouraged, even though he were not always the most helpful, it was advisable to withdraw the allotted square, and to allocate it to some other member if no work of value was done in a reasonable time. Ordinary Society excursions might be utilised for the furtherance of the object in view, and, attractive as architectural subjects always were to the photographer, greater attention should be paid to the recording of the manners, customs, and occupations of the people, particularly in villages and country towns, for which purpose the careful use of the hand camera was recommended. The standard size of pictures for the Warwickshire Survey was whole-plate, although prints of other dimensions were not refused, details being given on the back of the mount as to subject, date, time, focus of lens, printing process, and paper, together with general remarks, and the contributor's name and address. The majority of the prints hitherto accepted had been in platinum and carbon, but the permanency of the pictures should be unquestionable, and, although bromide prints might be acceptable, all gelatino-chloride, albumen, and P.O.P. prints should be rejected. The municipal authorities of the principal centres of population were regarded as the most suitable custodians of the results of the Survey, by whom they could be stored and exhibited at public libraries and museums, a comprehensive index being prepared to facilitate reference. The paper concluded with some suggestions for the proposed National Survey, with the British Museum as a depository, and with an emphatic recommendation that sets of lantern slides, with descriptive lectures, should be prepared and circulated in order that the community at large might derive pleasure and educational advantage from the photographic collections.

The CHAIRMAN alluded to the importance, not only of making contemporary records, but of endeavouring to collect existing photographs by the older processes, representing scenes which had already passed away. In the early days of photography many interesting and valuable pictures were secured, and it was even now exceedingly difficult to obtain copies of them. The late Dr. Diamond, for instance, had a most magnificent collection of early paper negatives, the vast majority of which were, at his death, scattered and lost.

The Rev. F. C. LAMBERT thought "the man with a hobby" in a certain direction, the collection of examples of Norman mouldings, doorways, spires, or any other particular feature, architectural, or otherwise, was distinctly to be encouraged, for he generally rode his hobby very thoroughly, and produced valuable work. He also considered it very desirable that the notes on the back of the mount should give details of the orientation of the subject.

Mr. T. BOLAS emphasised the need for full data as to orientation, scale, and the standpoint of the camera. He did not think bromide prints were suitable for records of survey work, and referred to some specimen prints by that process which had undergone considerable deterioration in a comparatively short space of time.

The Rev. F. C. LAMBERT said he made some bromide prints soon after the introduction of that process, and they were still in perfect condition.

Mr. MIDDLETON said the fact that some bromide prints had not faded was not conclusive evidence that such prints were permanent; he could produce some silver prints, made in 1856, which showed no sign of fading, and there was no doubt that bromide prints as prepared by some workers were more permanent than platinotypes produced by others, the method of working being a considerable factor in the permanence of the results. The Warwickshire Survey Society had made every effort to trace early negatives, and to obtain possession of them for the production of prints, and a large number had been secured for that purpose. The indication of the north point presented some difficulty, as the variation of the compass had to be taken into account.

Mr. L. WARNERKE, Mr. CLIFTON, and Mr. CLAPTON referred to the permanence of bromide prints; and

Mr. CHILD BAYLEY remarked that faded and yellow silver prints would yield very good negatives if copied on ordinary plates.

Mr. FOWLER briefly replied to the discussion, and, a vote of thanks having been accorded to him, the proceedings closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 3,—Mr. W. D. Welford in the chair.

Mr. A. L. HENDERSON passed round some lantern slides, amongst which were a gaslight picture of a meeting of the Association some years ago, taken with one Wenham light with an exposure of thirty seconds, and one or two of early Pall Mall shows with the Judges and officials.

In reply to a member, who sought to know which was the best lens for instantaneous out-door work for a $7\frac{1}{2} \times 5$ camera,

Mr. R. BECKETT spoke highly of the Stigmatic lens, which, in his opinion, was the best yet produced.

Mr. EVERITT named the Zeiss anastigmat, Series 7A, working at 6·5, and the Steinheil orthostigmat, Type 2, working at 6·8.

COLLODIO-BROMIDE EMULSION.

Mr. A. MACKIE gave a description of the making of collodio-bromide emulsions for transparencies, accompanied by a demonstration of the operations. The materials required are pyroxyline, methylated ether (·725), and methylated alcohol for dissolving the pyroxyline, cadmium, zinc, or ammonium bromide, and silver nitrate. The first of these should be that known as high-temperature pyroxyline, and the secret of success lay in getting hold of the proper stuff, which was a matter of some difficulty. If the *old* methylated spirit be obtainable, it will answer; but, if not, that obtainable now being contaminated with other matter, pure alcohol must be used. The ammonium bromide (which was the bromide used by Mr. Mackie on this occasion) should be freshly prepared. The collodion is made according to the following formula:—24 grains of pyroxyline to 1 ounce of methylated ether, and 7 ounce of alcohol. The mixture is well shaken, and left for a day or two to settle, after which the required amount is decanted off (say, 5 ounces). This has then to be bromised, which is done by adding 65 grains of ammonium bromide, dissolved by heat in a very small quantity of water, and to which has been added 6 drachms of methylated alcohol. The addition of this bromide solution is done gradually with shaking at each addition. The next operation is the sensitising, which, so long as there is an excess of bromide, can be done in daylight, the emulsion being unaffected in its liquid state. One hundred grains of silver nitrate are dissolved by heat in 100 minims of water, and 3 minims of nitric acid added; this is introduced in small quantities to the bromised collodion, constantly agitating the mixture, and a white, milky liquid will result. The colour of the emulsion by transmitted light should, if successfully prepared, be a bright ruby, and this can be best seen by coating a little on a clean glass plate. The bottle of emulsion is then left in a dark place for twelve to twenty-four hours, when it may be poured into a dish, and the ether and alcohol allowed to evaporate. The light must be prevented from reaching the emulsion during this operation. The pellicle which remains has then to be washed, which can be done by frequent changes of water or by allowing the tap to run on it for about twelve hours, the pellicle being broken up to facilitate the operation. The thorough drying of the washed pellicle is important, and may be done by a piece of linen stuff first, followed by alcohol, which should cover the mass, and be changed three times in as many days. When dry, the emulsion is dissolved again in equal parts of alcohol and ether, and filtered through a piece of cotton-wool moistened with ether, when it is ready for coating. The glasses must be thoroughly clean, and should be edged before coating with a solution of india-rubber in benzole, or rubbed over with French chalk. This precaution is to prevent the lifting of the film in development. The coating is performed in the usual way, and the surplus returned to a separate bottle, the contents of which, when of sufficient bulk, can be refiltered and added to the stock. The drying of the plates takes very little time, or may be hastened by heat. Mr. Mackie then exposed a plate already coated and dried, using a frame calculated to prevent the least slipping of the plates one upon the other, which would be serious to the collodion film. An inch or so of magnesium was flashed at a short distance from the frame, and the plate then developed. The formula used was—

Pyro	4 grains,
Bromide	3 ,,
Ammonia	2 minims,

to each ounce of water. Some spirit is flowed over the plate before development, and the plate washed in water until all greasiness has vanished. The plate, held in the fingers, is then flowed over with the developer, and the image, which appears very quickly, is examined as to density by transmitted light. It is fixed in hypo, washed for a short time in water, and dried either in the ordinary way or by heat. The slide was subsequently projected on the screen, and voted very good under the circumstances of its production. A perfect collodion emulsion should be capable of giving a great variety of colour by simple modification of the exposure and development, without additional treatment, and the film should be free from milky appearance, which, however, disappears in varnishing. The collodion should give a film not too powdery, nor too contractile, and the best way to secure a good collodion was by combining quantities of different samples until a satisfactory batch resulted. Mr. Mackie made a batch of emulsion up to and including the sensitising.

Mr. HADDON asked whether it would be equally successful if one bromised the alcohol before adding the ether and gun-cotton, suggesting it would be a better plan with large quantities.

Mr. MACKIE replied that it would.

Mr. HENDERSON suggested the substitution of the rubber solution by an edging of albumen for the same purpose. As it had not been mentioned, he spoke of the ease with which one could pile on the silver by intensification with these plates. He asked whether the lecturer had ever used any gum, soluble in both water and spirit, in making his emulsions. He found gamboge answered these conditions, and he thought the colour would not be objectionable.

Mr. EVERITT inquired if Mr. Mackie had any experience in the orthochromatising of collodio-bromide, and mentioned the Albert process, which enjoyed considerable reputation on the Continent, he believed. As regards the bad quality of the methylated spirit now obtainable, he criticised the restrictive regulations of the Customs now in force.

Mr. MACKIE, replying to Mr. Hodd, said any unequal coating in the plate was not a serious matter, and would not be noticeable in the finished slide. In answer to Mr. Thomas, he said varnishing did brighten up the image, but at the expense of the finer gradations. A first-rate emulsion ought not to be varnished. To Mr. Rapson, he said the process lent itself to after-toning by the sulphocyanide and gold process.

Mr. BANKS remarked that, although he got practically the same results, and Mr. Mackie's procedure was perfectly correct, his own method was diametrically opposite to the lecturer's. Collodion emulsion work could be varied in a great many directions, and yet make a good emulsion. He advocated the unwashed emulsion for one thing. It was easy to treat four ounces, but when gallons were involved it was a different thing. He took the precaution to keep the emulsion acid, and held that it should have a metallic bromide, one containing two atoms of bromine in combination, the alkaline bromide having only one. He had experienced difficulty regarding the pyroxyline, and, out of thirty samples tried, had found two only soluble. He found no difference between the high and low temperature. He did not advise the purchase of the cotton, but rather that the user should make it himself—one of the easiest things to do.

Mr. Mackie then showed thirty or forty slides, which were very favourably received.

Mr. MACKIE added that, although the variety of colour obtainable was very great, it was impossible to get a disagreeable colour.

PHOTOGRAPHIC CLUB.

JUNE 2.—Mr. R. P. Drage in the chair.

The CHAIRMAN welcomed Mr. Dunmore to the meeting.

Mr. WELFORD read a paper upon

THE NOVITAS STRIPPING P.O.P.,

from which the following are extracts:—

We are all familiar with the common way of printing in a cloud, viz., by shading the frame; but in a cloud negative there is usually some amount of foreground. I am, of course, referring to those made by ourselves, not the commercial samples which can be purchased at shops. Now, that foreground is sometimes obtrusive. Novitas paper obviates this trouble in a very simple way, which I will endeavour to describe briefly. First, however, it will be necessary to give an outline of the operations involved in the use of the paper. It is printed in the usual way, and can be watched in the frame the whole time. Beyond carrying the printing to what must be described as an extreme depth, there is no difference between Novitas and other printing-out papers. The print is then toned and fixed by one of the usual methods, and is then immersed in hot water until the film detaches itself from the paper. A piece of glass is then placed in the dish, the film placed upon it, and the glass set up to dry. The result is, of course, a positive print or transparency. Now, if we in turn print from this transparency, we obtain a fresh or reproduced negative, following throughout exactly the same procedure. To apply this to the production of a cloud negative, in making the transparency the negative is shaded by one or other of the usual methods, a piece of card, cotton-wool, handkerchief, duster, or what you will. Should, in spite of your care, a little of the foreground print, it is not of much consequence, and this fact often enables the cloud to be printed down much closer to the foreground than would otherwise be the case. The print is treated as before described, with the result of a transparency on glass, much the same as a cloud printed on the upper half of a piece of paper. It is at this point, or rather when we set to work to print again in order to get the reproduced negative, that the special advantage of a printing-out paper is found. As we shaded the transparency in the first instance, the foreground will be clear glass or nearly so, therefore the reproduced negative will have an opaque foreground, so that when printed from it will give the cloud above, and leave the lower part of the paper untouched, ready for the after-printing in of a foreground from another negative. Up to this point we have not left well-known processes, but should the lower part of the reproduced negative be insufficiently dense, or should any trees or other objects from the original negative appear, all that is necessary is to sun down the lower part to the required density or to join the cloud correctly. This can be readily done on a printing-out paper, but it would certainly be a very skilful and difficult operation with a developed paper, *i.e.*, one in which no image is visible, or only a slight image at the most. To turn now to the manipulation of the paper itself. Like collodion paper, it has a tremendous curling action at all times, but, unlike the other paper, the use of hot water is barred. The instructions tell us to use very little water in the preliminary washing. I can supplement that by saying the whole secret practically is in the use throughout of very little liquid. In washing, toning, and fixing, the less water or solution there is present in the tray, the less the paper will curl. This can be readily tested by noticing the increase of curl with the increase of solution. This makes the handling of prints somewhat personal, that is, the nearer we can go to treating each print separately, the less curl there will be. In the final washing, however, I do not myself take so much trouble, unless the quantity is small enough to deal with singly. The toning is apt to be uneven when using the separate bath system, unless the solution is weak in gold, in which case it takes considerable time. I have rung the changes through sulphocyanide; acetate, carbonate, and phosphate of soda baths; also with borax. The results are much the same. A strong point is the power of reduction in the fixing solution, which is greater than with most printing-out papers. Any over-printed proof (within reason) can be very comfortably reduced by prolonged immersion, and without any detriment to the ultimate result. The tone to a greater extent than usual is governed by the depth of printing. The longer toning is continued, the weaker the print grows—it reduces all through the toning bath. Therefore, to get a cold tone (as compared with a warm), the original printing must be much deeper. In the case of transparencies and reproduced negatives, when the tone of the result is a matter of indifference, perhaps the reducing effect of the toning bath helps towards a more perfect result, as the print can be taken out at the right stage regardless of tone. I have, however, no desire to mislead, and must say that, in common with other things that have been produced somewhat on the same lines, warm tones must be expected.

A discussion ensued, in which Messrs. HAES, FOXLEE, THOMAS, DRAGE, and others took part.

Brixton and Clapham Camera Club.—June 1.—The Circulating Exhibition, arranged by the Affiliation of Photographic Societies, was on view, and the evening was profitably spent in an inspection of this magnificent collection.

Hackney Photographic Society.—June 1, Mr. W. L. Barker presiding.—The pictures in the First Monthly Excursion Competition were shown, and the report of the Judge (Mr. E. J. Wall) made known. The order of merit for the first six pictures was as follows: Mr. W. A. Hensler, first, second, and third; Mr. Selfe, fourth; Mr. Hunt, fifth; and Mr. Gosling, sixth. It was announced that the excursion to Bricket Wood, on Saturday, June 12, was to be abandoned for one to the Stort Valley. Trains to leave Liverpool-street at 2.15 p.m. for Rye House. Mr. R. BECKETT gave an interesting lecture on the

DALLMEYER-BERGHEIM AND STIGMATIC LENSES,

in the course of which he explained that the former had been produced for a certain purpose, viz., the production of a certain amount of softness or fuzziness. To bring this about, the lens had been corrected for all the usual defects with the exception of a small amount of chromatic and spherical aberration. An important feature of the lens was that, instead of having only one plane sharp, as in most other forms of lenses with full aperture, it possessed great depth of focus, such as it was. The lecturer thought the Stigmatic lens to be the greatest advance yet made in lens construction. Having explained its composition and capabilities, he mentioned, as an instance of this latter, the $5\frac{3}{10}$ inch lens. This would serve four purposes. In the first place, it made a perfect hand-camera lens; secondly, a wide-angle for half-plate; and then, by using either the back or front lens separately, half-plate lenses of medium and narrow angle respectively would be obtained.

FORTHCOMING EXHIBITIONS.

1897.	
June 23-30	Paper-makers', Printers', Stationers', Fine-art Publishers, &c., Exhibition, Royal Agricultural Hall, Islington, London, N. Managing Director, W. E. Aylwin, 27, Leadenhall-street, London, E.C.
December 9–11	*Aintree Photographic Society.

* There will be Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

SUTTON'S PANORAMIC APPARATUS.

To the EDITORS.

GENTLEMEN,—In a note on page 336 of your current issue you criticise and deprecate an observation made at a recent meeting of the Royal Photographic Society to the effect that this apparatus originated about 1856, an observation for which I am responsible. My remark as to the time referred to the apparatus itself, and not to the time at which that particular dark back which was exhibited was constructed.

Your historian appears to have overlooked all publications of Sutton on the subject prior to his paper read before the British Association, but, as a matter of fact, an exhaustive publication took place in 1859, in which Sutton detailed experiments going back three or four years. In this paper Sutton also described the two derivative forms of his panoramic lens, namely, the cylinder lens and the fluid orthoscopic, this latter being a semi-immersion lens, almost forgotten, but which may step into prominent importance for scientific purposes (possibly in connexion with interference heliochromy) at any moment. Historically the Sutton panoramic lens is of special interest, as in relation to this Sutton put forward the doctrine of the concentric form, although with the means then at his disposal he could not realise all its advantages.

In your note the term "Sutton's panoramic camera" is used. This, however, was not the same instrument as the water-lens camera, but a pioneer form of an instrument for flat plates, and now better known as Johnson's pantascopic camera. The water-lens apparatus for curved plates was sold as "Sutton's panoramic lens and apparatus." I quote the title from a four-page descriptive circular issued by Mr. Cox, of Snow Hill, who first put it on the market, but afterwards it was made by Mr. Thomas Ross, and the dark back now in the hands of the Royal Photographic Society is probably one made by this gentleman.—I am, yours, &c.,

THOMAS BOLAS.

Chiswick, June 5, 1897.

THE FADING OF SILVER PRINTS.

To the EDITORS.

GENTLEMEN,—A letter in your last issue by J. G. M. is, I am afraid, "too good to be true."

Gelatine prints "a year or two in show-cases unharmed!" Really J. G. M. is an exceptional worker, and should give his "wrinkles" to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, that they may bless him.

"With albumen paper," he also says, "I could never secure prints from yellowing rapidly." Rapidly! More hypo, good friend, and your albumen prints will stand for many generations! Yes, our experience of photography dates back from 1853, and we have many photos of that period "still to the fore," nay, will be in existence, no doubt, long after their producer has joined the majority.

Then, J. G. M. seems to think that gelatine and collodio-chloride papers are on the same platform with regard to permanency. This requires some consideration. There is no doubt that a few of the collodio-chloride prints made by us, and hung up under glass in our studio two years ago, along with some gelatine ones, have become lighter and warmer; but these were, I am sure, originally too lightly printed, and perhaps not washed enough. The gelatine ones, one and all of them, are lighter, and have, moreover, become a little sickly in the lights and bluey in the shades; perhaps they, too, needed more hypo and washing. Still, weighing all one knows, not only about his own work but about that of many others, the conclusion arrived at is that possibly the less stable of all silver prints are those on gelatine.

Collodio-chloride prints I find, if *firmly*, say deeply, printed from negatives that give good platinum or carbon photos, and thoroughly fixed and washed, will stand good for many, many years, whereas those, I am afraid, from thin, ghostly negatives will go light very soon. After all, carbon is king in portraiture.—Yours, &c.,

Edinburgh. A VETERAN PHOTOGRAPHER.

THE SWING BACK.

To the EDITORS.

GENTLEMEN,—I have read with much interest the article in your issue of to-day on the subject of the "Swing Back." The difficulty seems to me to arise from a general misunderstanding, not by any means confined to photographers, on the subject of perspective.

In *Geometrical Perspective* the picture is supposed to be projected on a plane surface, usually vertical, which is called the picture plane; the distance of this plane from the eye is the distance of the picture, and the point where a perpendicular from the eye on the picture-plane meets it is the point of sight. That, however, is not the way in which the human eye sees the object; the surface which the eye sees clearly at once is but small; when we look at an object which is of moderate size, the eye travels rapidly and imperceptibly over the surface, so that we seem to see it all at once, and in this case the picture formed by a rectilinear lens gives so nearly a true representation that the difference is not perceptible.

But when the surface is large, the case is no longer so; the observer is conscious of the change of point of sight, arising from the fact that the picture plane changes so as to be always perpendicular to the direction of the point at which we are, for the moment, fixing our attention.

The picture formed by a rectilinear lens is in true geometrical perspective, but in order that it may produce the same effect as the object to the eye, it must be seen from the same distance as that of the picture plane on which it was projected, a distance that corresponds to the focal length of the lens employed; it is rarely so viewed, and if the picture be small, especially if taken with a wide-angle lens, cannot be so. The consequence is the complaints often heard of the perspective being wrong in photographs. It is so *for the observer's point of view*, but the fault is not in the photograph but in the observer. When a picture is meant to be examined of the original size, it should be done with a lens of the same focal distance as that with which it was taken; otherwise it should be enlarged, and the enlargement should be such that the virtual focal distance of the lens with which the enlarged picture is taken is that at which it will be inspected. In this case the eye will roam over the picture just as it does over the real object, and the appearance will be true.

We generally place ourselves at such a distance from a picture that we can see the whole surface, as we think, at once: from what I have said it will be understood that no view of a picture taken with a wide-angle lens can be so viewed without sensible recognition of some distortion when the subject is architectural, and that whether the picture is long or high. In the case of a pure landscape, or when there are only buildings occupying the central parts of the picture, the distortion may escape notice, but such a picture as that on which you commented is only to be seen *properly* from the proper distance, and with the eye opposite that part of it which was where the axis of the lens fell on the plate, *and this whether the swing back was used or no.*

I need hardly say that in attempting to explain this matter I have adhered to the rigorous conditions required by geometry. Fortunately the human eye is a very imperfect instrument, and our perceptions are quite unable to appreciate the accuracy given in our pictures by the very perfect lenses we now possess; consequently we can tolerate considerable departures from the precise distances and points of sight I have mentioned without offending our senses. The photographic lens is an optical apparatus infinitely superior to the eye. I think, indeed, that perhaps the straining at perfection has been carried too far in some respects, and that even for architectural purposes (where the object is not to make measurements) a slight amount of the barrel-shaped distortion would be an improvement in all but narrow-angle lenses, but the perfect definition on a plane should not be given up. Whether this would be worth doing, as a matter of business, I cannot say; but, failing this, discretion in the use of the swing back would be desirable.

As regards the case you give of measurement of a tower, I would like to point out that, while the fact is as you mention it, the deduction which many will make that the lens is in fault is not correct. If we hang up two plumb-lines and measure the distances between them at various points with a sextant, the angles will continually decrease as we go higher; if, however, we use a properly adjusted theodolite, we should find the angle between them, read on the horizontal limb, alike wherever we measured it. The former is the analogue to your experiment, the latter to the case of the camera as adjusted with the swing-back vertical; and the difference arises from the change of the picture plane in the first place, and its constancy in the latter.—I am, yours, &c.,

11 *Clifton-gardens, Maida Hill, W., June* 4, 1897. J. F. T.

To the EDITORS.

GENTLEMEN,—Allow me to say one word in regard to the swing back and its use. I have found, a long time ago, that, when taking a tall building from the ground, if I gave it by the use of the swing back perfect parallel lines, the building looked top-heavy; so I give it now a very slight leaning or perspective of about a sixteenth of an inch at the top, and, however on careful scrutiny it can be detected, yet the general effect does not suffer from it. If, however, the view be taken from a window opposite, on the second or third floor, the lines should be kept parallel, as the defect of a slight perspective would be more objectionable.—In your answer to "Spotty Film Negatives," you say that, owing to having only three or four spoilt films in a dozen, shows that the defect is his, and not that of the maker. Allow me to differ from you, as I think the reason you give is just the contrary. You are aware that films as plates are coated on large surfaces, which are then cut up to size required. The defects may very well be found on *the edges* of some large surfaces, and, when cut up, show on a few plates in a dozen packages. I have had that experience myself, and it was even once admitted by a certain large manufacturer in London; but, as it was only a mistake on his part (the admission), he contradicted it afterwards.—I am, yours, &c., A. LÉVY.

Asnières, Seine, June 5, 1897.

THE PRICE OF FILMS, &c.

To the EDITORS.

GENTLEMEN,—May I point out what I and many think a cause for much complaint, viz., the excessive price of films over plates? I have recently been on a journey with friends. We each had Kodak cameras (Bullet type), and the cost for films becomes a serious matter compared to plates, the latter 1*s.* per dozen, the former 2*s.* 6*d.* for same quantity. The difference is enormous.

Another suggestion I would venture to make, and that is that Solio papers should be made the size of the bull's-eye, so as to avoid labour and time wasted in cutting down; the present waste off a thirty-six sheet, quarter-plate size set, would make up a packet of, I should think, a forty sheet set.—I am, yours, &c., WANDERING AMATEUR.

June 1, 1897.

A JUBILEE SUGGESTION.

To the EDITORS.

SIR,—May I venture to suggest, through the medium of your widely-read JOURNAL, to the employers of labour in the kindred industry, the unique manner in which the firm of J. H. Dallmeyer & Co., Limited, have thought fit to commemorate the Queen's Diamond Jubilee. The Directors have announced their intention to grant two days' holiday to their *employés*, and to give each workman three days' pay. In this manner they will have the satisfaction of knowing who are the recipients of their generosity. It will thus add one more link to bind employers and *employés* together.

I hope this idea will be carried out in other firms, and my brothers in the craft benefited in a similar way as an old *employé* of the firm of J. H. Dallmeyer, Limited.—Yours, &c., J. W. THOMAS.

54, *Sandmere-road, Clapham.*

PHOTOGRAPHS REGISTERED:—

E. Adolphus Tear, 5, Westgate-street, Ipswich.—*Photograph of group of six children in their night dresses going to bed, titled "Good night, mamma."*

Samuel Foxon, 88, Sharrow-lane, Sheffield.—*Photograph of opening of City Hall, Sheffield, by Her Majesty the Queen, on May* 21, 1897.

Isaac Slater, Art Studio, Mostyn-street, Llandudno.—*Photograph of Happy Valley, Llandudno.*

David Proctor, 31, Wellgate, Dundee.—*Three photographs of Jubilee Address to Her Majesty the Queen from the Lord Provost, Magistrates, and Town Council of Dundee.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

W. F.—In our next.

A. M. Z.—Quite rapid enough for the purposes named.

RECEIVED.—E. PENFOLD; D. BUTT; F. W. URQUHART; C. H.; and others, In our next.

G. PITCHER.—Try either Appleton & Co., Bradford, or Marion & Co., Soho-square.

H. W. TAUNT.—We closed the correspondence some weeks ago. Thanks all the same.

A. BRINGET.—We have written the gentleman named, and trust the letter will have the desired effect.

J. H. HURST.—In our opinion you are not entitled to use the term; if you did, you might be proceeded against by the Association of Royal Warrant-holders.

T. A. BLUNT.—It is against our rules to recommend one make of apparatus in preference to another. Write to any of the dealers whose advertisements are to be found in our outer pages.

W. C. HANCOCK.—1. Several formulæ for hydroquinone developers, without caustic alkalies, are given at page 902 of the ALMANAC for 1897. 2. We have not tried the developer you name.

J. W. (Atherton).—Probably you could claim damages in the circumstances, but the question is one for a purely legal opinion. Personally we should be inclined to close with the Company's offer.

PHOTO-LITHOGRAPHY.—R. C. M. If the ink all comes off when the paper is wetted, it shows that the exposed parts of the bichromated film have not been sufficiently hardened by the light. Better increase the proportion of bichromate and give longer exposure.

G. BARKER. If you can afford to diaphragm down to, say, *f*·22, then a lens of the rectilinear type might answer your purpose. Assuming that neither expense nor rapidity of working is an object, one of the Zeiss lenses, Series V., would be best.

PROCESS WORK.—THOS. GEORGE. The process, as published, is all right. Your lack of success with it is due to inexperience in its working. It must not be expected that, by merely reading the details of any process, however fully given, success will be achieved in a few days.

MENDING CELLULOID ARTICLES.—W. WADE asks the best cement to use in repairing the corners of a celluloid dish which was cracked.—No cement at all is necessary. All that is necessary is to moisten the edges of the celluloid with a solvent of that material, and keep them pressed in close contact till the solvent has evaporated. Acetic acid, alcohol, acetate of amyl, and many other solvents may be employed.

COPYRIGHT.—S. J. writes: "If I send views of the Royal residences and portraits of the Queen and members of the Royal Family to be printed by collotype in Germany—the photographs being the copyright of others—do I run any risk in publishing them here if they are distinctly marked 'Printed in Germany'?"—Yes, certainly, just the same as if they were printed here. The Copyright Act is not to be got over in that way, we are pleased to say.

A. MORELL MACDONALD (Hon. Secretary Southland Camera Club, Invercargill, New Zealand).—Taking the home standard of photographic production for our guide, we regard the example sent as an ordinary piece of work. It gives us the impression of being a chance nap-shot, the arrangement of the figures in which is fairly effective. Exposure and printing appear to be about correct. Such a result, however, would stand very little chance of success in a competition here.

LENSES.—W. REES writes: "Can you advise me as to what lens I should require for three-quarter figures and heads in a studio of nineteen feet long? Could I use a 3B Dallmeyer? also a lens for 12×10 in studio for groups?"—The lens named will do very well for the purpose mentioned, but it will not do for full lengths in so short a studio. For groups, select an "astigmatic" or "stigmatic" of about thirteen or fourteen-inch focus that works with an aperture of about *f*·6.

T. CLEGG.—We have seen very many examples of the phenomenon, which admits of only one explanation, viz., that the plate received a double exposure, an accident that might easily occur to you, working with the shutter you name. We cannot account for the absence of the feet, although, from the length of the dress and the depth of the rug, it appears to us conceivable they would not show in the negative. We advise you to be less sceptical as to double exposure being the cause.

METHYLATED SPIRIT.—R. SUMMERS writes: "I have made inquiry at several oilshops and also at a chemist's licensed to sell methylated spirit, for it without the mineral spirit. One and all tell me it is not now allowed to be sold. One told me—the chemist—that it could not be had for 'love or money' now. I do not mind paying extra for it, as I want it for a special photographic purpose, and the ordinary will not do. Is it correct that it is not to be had?"—No, it is not correct. But to obtain it you will have to get a licence from the Excise; this will cost you nothing, but you will have to give a heavy bond that the spirit will only be used for manufacturing purposes, and you will also have to purchase it in wholesale quantities—five gallons and upwards at a time—direct from a methylator.

DOUGLAS.—1. We have seen the articles described produced by photographic means, but we should be inclined to think that you might protect your idea 2. The collotype process would probably be best. 3. Better obtain a form at your local post office and make application yourself, unless you are prepared to incur an expenditure of possibly 6*l*. or 7*l*. If you can disburse the latter sum, write again, and we will give the information asked for; but, frankly, we do not think the idea sufficiently good to justify such an initial expenditure.

MOUNTS; R. P. S.—DELTA asks: "Can you tell me a way of filling up the impression produced on mounts from the name being stamped on? I have bought a large number of mounts of a photographer going out of business, and want to know of a method by which I can fill up the name, so that I can put photograph over it without the impression showing. I could then have other end of card named. 2. What are the qualifications necessary to become a member of the Royal Photographic Society?"—1. We know of no way of filling up the intaglio, except by subjecting the mount to such pressure, by rolling, as will reduce it to the same thickness all over as the depressed portions now are. This will probably cost more to have done than to purchase new mounts. 2. Simply get proposed by a member and seconded by another. Write to the Secretary, 12, Hanover-square.

PINK TONES.—CENTRAL I. says: "I should be glad if you can advise me on the following subject: For the last three months I have been troubled with a nasty pink tint in the half-tones of all my prints. My mode of working is as follows: I wash my prints about fifteen minutes before toning; I use the formula recommended by the makers of the paper (I have used Solio, Ilford, Paget, and Sylvio), yet with the same result with all of them. If you can tell me how I can avoid this trouble, I should be very much obliged. I have toned both by subdued daylight and by artificial light, yet with the same result. It cannot be the fault of the paper, as they are all alike. I have been in business for the last ten years, yet have never been troubled like it before. I am most particular in making up the baths. I have used the gold as sent out by the makers, and also neutralised it with chalk, yet no difference (both sulphocyanide and phosphate of soda)."—The print sent, we should say, is much over-toned. Over-toning with gelatine papers is very prone to give half-tones of a pinkish tint.

COMPOSITE PHOTOGRAPHY-TONING.—C. D. L. asks: "Can you inform me on the following points: 1. The correct proportional exposures in a composite photograph of four persons, who would separately require the same exposures. I understand that the earlier exposures get partially obliterated; but would the correct proportions be 4, 3, 2, 1, or 6, 5, 4, 3, or what? 2. The phosphate toning bath for P. O. P., recommended by a contributor to the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC (p. 736), viz.: sodium phosphate, one drachm; gold chloride, one grain; water, fifteen ounces, 'toning to a purple black in five minutes.' This is so, but with me the tone entirely disappears in the usual fixing bath, and the final result is a pale brown. Is this due to insufficiency of gold in the formula in proportion to water? I use the above quantity for six half-plate sheets. 3. Can you recommend a toning formula with sulphocyanide and sodium phosphate mixed? With some mixture of the kind, Aristotype paper used to give excellent purple-black tones, but I do not know the correct proportions for P. O. P. 4. Cresco-Fylma solution 'will not keep good in a glass bottle' (though I cannot find any corrosive action on the glass). Is there any kind of bottle that it will keep good in?"—1. Our practical experience in "composite" photography is too limited to say the correct proportions. A few tentative experiments, however, will settle the point. 2 and 3. All printing-out papers do not behave alike. The toning bath that may be best for one will not do for others. Possibly, if our correspondent tried another brand of paper, his results would be different. 4. It will no doubt keep if stored in a gutta-percha or leaden bottle. Hydrofluoric acts upon glass, though perhaps its action may not be noticeable on the glass itself.

ALBUMEN PRINTS.—ARTIST writes: "I shall be much obliged if you will kindly answer the following questions:—I have up to the present been using gelatino-chloride paper, but have just given a trial to double albumenised paper, and the results, I think, are superior in many ways, namely, evenness of tone and more correct rendering of half-tone. (1) I have just finished a fresh packet of fifty cabinet pieces, bought a week ago. I used half of this three days ago, but after removing the prints from fixing bath, containing ammonia, some of them were blistered. Yesterday I used the remainder, but forgot the ammonia, and all the prints after being fixed were covered with small blisters. What is the cause of the blisters? 2. This last batch I placed in a dish over a gas stove, keeping the prints moving until the water boiled, and then allowed them to cool down and finished washing. The prints, after being finished and passed through a hot roller, showed no sign of the blisters. Are they likely to come up again, or are they not permanently removed? 3. My dark room gets rather warm in hot weather. Perhaps the baths are too warm. Would it be an advantage to lay the dishes on marble or lead, or is it necessary to use ice in the toning and fixing solutions? 4. The holes at the bottom of my washer are rusty where the enamel has come off. Will the prints be injured by using the washer? 5. Can you tell me of a washer for cabinets and whole-plate size prints which can be used without tearing the prints? If not, (6) how many changes, moving the prints one by one from one dish to another of fresh water, will properly remove the hypo from the prints?"—1. Some papers are more apt to blister than others. See answer 3. 2. We should say the blisters will not appear again. 3. To avoid blisters, use all the solutions at the same temperature as the washing waters. If one is cold and others warm, blisters may be expected with the majority of papers. 4. Very probably they will if the prints rest in contact with the rusty metal. 5. Marion & Co. will supply one. 6. An hour and a half to two hours under these conditions, will be ample.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1937. Vol. XLIV.—JUNE 18, 1897.

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EX CATHEDRÂ.

THE celebration of the Queen's Diamond Jubilee, which is now imminent, must not be allowed to pass without a reminder of the large part which photography has played in the intellectual, scientific, and material progress of the people throughout the reign. The sixty years during which the present Monarch has occupied the throne have actually witnessed the invention and growth of photography, without which, in its present developments, modern art, science, and industry could not properly exist. There is, indeed, scarcely a department of human activity to-day into which photography does not deeply enter, and it has long since established its right to be ranked in importance with steam, electricity, and the printing press. Wonderful as its progress and achievements have been throughout the peaceful and prosperous reign of Queen Victoria, there is room for conjecture that its possibilities are yet far from exhausted. Photography, in a special manner, long ago secured, and has always retained, the active support of the Queen and the members of her House, and we are sure that, during the approaching celebrations, photographers of every degree and kind will enter with peculiar heartiness into the national rejoicings, the central figure of which symbolises the mighty advances in civilisation which the British race has made during the last sixty years.

* * *

ANTHONY'S *Bulletin* informs us that the interest manifested in radiotint photography (the Chassagne process) since the announcement contained in the May *Bulletin* has been unprecedented. Our contemporary knows of nothing in late years to which it can be compared. "The prints brought from the studio of M. Chassagne have been examined by thousands of people, and many who have seen them once have returned to study them still further. Representatives of the daily and photographic press have studied them very carefully, and, while all agree that the effects are wonderfully close to the colours of nature, the wonder and mystery increases as one tries to account for the chemical change which makes it possible for different parts of the print to extract from the colouring liquids the varying quantities and tones of colour necessary to produce the varied hues which appear in the finished prints." There are some observations on the subject of the Chassagne results in another part of the present number of this JOURNAL which are in striking contrast to the foregoing appreciative remarks.

* * *

OUR contemporary, referring to the publication in many of the photographic journals of the alleged formula for the Chassagne radiotints, and the somewhat curious comments that have accompanied it, says it would like very much to learn on what authority this formula was coupled with M. Chassagne's name. In view of the fact that the nature of the liquids and the formula under which they are compounded are "held strictly secret by the inventor," and, further, that several very important points in the manipulation, as set forth by M. Chassagne, are entirely ignored in the published document, it submits that the public should be informed as to the authority on which it was published. If it develops that the formula is a correct transcript of the patent specifications, it would seem to our contemporary to indicate that the inventor has made use of it on the lines suggested by Talleyrand, who claimed that language was more useful for the concealment than the expression of thought, and "it is not at all impossible that the formula may have been made with an idea of confusing the reader, and covering up the secrets

of the invention and the method of compounding the several liquids rather than making it public." We have already dealt with this aspect of the Chassagne process, and the mystery surrounding the published patent specification, and we need now only repeat that the specification bears the names of Dr. Dansac and M. Chassagne, and that the *method of procedure* therein described is strictly analogous to that which has been demonstrated by M. Chassagne. If, as our contemporary appears to suggest, the *details* of the process are designedly inaccurate and misleading, we are obliged to remark that those responsible for such a proceeding can hardly be congratulated on the strange uses to which the British Patent Office has been put.

* * *

Recently, at Aberdeen, Mr. James Bryce, M.P., delivered an address on the preservation of natural scenery. He pointed out that the enemies who chiefly threatened natural scenery were three—advertisements, commercial companies, and railways. Advertisements had really become a horrible nuisance, and a Bill had been brought into the House of Commons giving power to local authorities to put them under control. There was one form of advertisement that was particularly objectionable—quack medicines. As to the steps that should be taken to preserve natural scenery, Mr. Bryce suggested the establishment of a department of the State, which would be constituted with the duty of protecting three classes of objects—buildings or sites of great historical interest, ancient buildings of exceptional beauty, and striking and remarkable pieces of natural scenery. How the protection should be exercised was, of course, a difficult matter, but the principle had been recognised in the Act for the Protection of Ancient Monuments, and he should like to see that excellent principle very much extended. Meantime they ought to have societies everywhere for the preservation of all those things in which the public had an interest, and also for protection of rights of way. We are sure that all photographers share the ideas of Mr. Bryce on this subject, to which we have frequently referred in terms similar to those used by the right honourable gentleman.

* * *

Our contemporary, the *Daily Chronicle*, is responsible for the following: "A curious experiment, that of reproducing photogravure illustrations on a rotatory press, has been tried in the Machinery Hall of the Brussels Exhibition. Our correspondent states that the machine, which belongs to the proprietors of the *Petit Blue*, an illustrated daily, prints at the rate of 18,000 per hour, and the result was so far successful that the problem of utilising photogravure for newspaper purposes is practically solved." We confess ourselves doubtful of the literal accuracy of the foregoing statement. Certainly photogravure, as it is ordinarily understood and practised, would not appear a suitable process for rapid newspaper printing.

* * *

Two or three little books of animated photographs have been sent us by Mr. S. Lubszynski, of 4-6, Königsstrasse, Berlin. The books measure about 2½ inches by 1½ inches, and contain about fifty leaves, upon which are printed half-tone reproductions of a series of animated photographs. As the right thumb is pressed against the edges of the leaves, and the latter are rapidly released, the effect of the movement is obtained, while, if the leaves are released by the *left*, the series of pictures will be viewed in the reverse order, and somewhat comical results produced, as may be readily imagined. These little books sell, we believe, at a penny each.

* * *

We are always glad to recognise evidences of artistic taste in the smaller details of a professional photographer's business. Even in the comparatively slight instance of the card of terms undoubted scope exists for impressing and pleasing a sitter, a fact of which Mr. Drinkwater Butt, photographer, of Carlisle, has taken advantage. This gentleman's price-list, &c., is a neatly printed booklet of eight pages, enclosed within an attractive green cover, upon which is placed a small portrait, apparently in platinum, and surrounded by a white margin. The eye is caught and pleased by such an artistic production, which, as the phrase runs, is too good to throw away, and thus it both immediately and ultimately benefits the photographer.

* * *

We announced last week that the Council of the Royal Photographic Society had conferred the Honorary Fellowship of the Society upon Professor Gabriel Lippmann, whose work in interference colour photography is well known. This year's Progress Medal of the Society has already been voted to Professor Lippmann, who, it was hoped, might have been able to attend personally to receive it at the hands of the Society's President. It may be interesting to note that the Honorary Fellowship of the Society is enjoyed by M. A. Davanne; Dr. J. M. Eder; Mr. James Glaisher (past President); Mr. Maxwell Lyte; Dr. A. Miethe, and Dr. H. W. Vogel.

* * *

At a recent trial in Paris of a man for the brutal ill-treatment of his son, a child of two years, the prosecution produced a number of water-colour drawings depicting the wounds on the poor little creature's body. The judicial authorities were loud in their praise of these appallingly realistic pictures, but, when it came to paying for them, they professed the utmost astonishment at finding that the artist, M. Davis, demanded 60*l.* for his work. They declared that a tenth part of the sum asked was all they were prepared to pay for these specimens of forensic art. To arrange the matter, it has taken the personal intervention of Dr. Brouardel, the famous *doyen* of the Paris Faculty of Medicine, for which body M. Davis is in the habit of making anatomical drawings. Dr. Brouardel has succeeded in rectifying the ideas of the magistrates on the subject of the remuneration of artistic work, and M. Davis is to be paid in full. We presume that there are reasons for deciding the French authorities to prefer drawings to photographs in such cases as the foregoing, although we fail to realise the advantage of hand work over that of the lens and the dry plate. The latter is the cheaper and the more accurate, at any rate.

* * *

It was quite time that our American brethren vindicated their right and ability to make a modern contribution towards the solution of the colour-photography problem, and they appear to have recognised the fact. We have it, on the authority of an American contemporary, that "in San Francisco a young scientist is making photographs in natural

colours by a method that will make Chassagne's wonder get off the earth into the histories when it is got to working just exactly right. This assertion is made on the authority of F. P. Andrews, a well-known photographic dealer and expert, and one or two others. The inventor's name is a secret, as is his process, but the fellow has nailed the principle and has produced coloured photographs that are wonderful. 'Our man is working on an entirely different principle from the method of M. Chassagne,' said Mr. Andrews, and his method is vastly more simple. He says that his discovery is based on principles of light and chemistry quite different from those of the Frenchman. A year ago, as the reliable story is gathered, this local inventor, who had for many years been an expert amateur photographic crank, had hit upon the secret of, and had made photographs in, colours. He was penniless, wanted capital, and went to Mr. Andrews, who talked with one or two men of large means. It was a business proposition wholly. The pictures were crude and the process complicated and uncertain, though the principle and possibility were there." The usual attributes of poverty, secresy, and originality are, it may be observed, associated with this, the very latest "discovery" of photography in natural colours. The monotony of this sort of thing is amusing, if nothing else.

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Messrs. Thorn & Hoddle, the makers of the "Incanto" Acetylene Generators for general lighting purposes and installations on any scale, draw attention to the fact that those generators, known as Pattern B, meet the requirements of the London County Council. The air is expelled from the holder before the generation of the gas commences, and there is an improved safety valve attached.

ON JUBILEE PHOTOGRAPHS.

The Jubilee topic has long become so trite, that we imagine our readers pausing the moment they see the title at the head of these remarks; nevertheless, there are several practical points of view from which the subject can be seen, that it is well worth while putting them under examination. We were led to deal with the subject by a conversation with a provincial photographer, who told us that so many of his sitters had asked him if he was going up to London to photograph the procession that he "began to think there was something in it." Now, we should think that a moment's consideration would show that, with his own particular *clientèle* to work up, any photographer dwelling some distance from London would display lamentable want of judgment if he thought there was anything to be made in that direction. That the sale of photographs is a moribund business, any dealer in such stock, wholesale or retail, will at once aver if his opinion be asked; there remain only the illustrated papers to fall back upon. We think that the market for them will be so glutted, that very few photographers, even in London, will do more than pay their expenses, and may consider themselves lucky to do that out of copyright fees. True, there is the cinematograph in reserve; but, apart from the fact that there are as yet few instruments in use, their commercial success, as applied to the Jubilee, is quite a lottery. If the weather be unsatisfactory, there will not be much to be got out of the "moving figure pictures."

Let us now look at what the papers can be for local provincial work. There are not a dozen papers, all told, to which photographs of jubilee celebrations can be sent with any success. After the first week or two the subject will be stale—the illustrateds want up-to-date pictures—hence everything likely to be accepted has to appear in, say, a score of aggregate issues. These periodicals, as a matter of course, will be almost full of the London celebration, so that the utmost possible space left for illustrations of provincial celebrations will be very limited. There will be some hundreds of towns, which in one way or another will afford food for the camera. It is a very simple matter of arithmetic, therefore, to work out the probabilities of any particular photographer making money out of the papers. His time would be far better devoted to nursing local interests and demands rather than taking views with the idea of sending them up to London for the papers to publish. Of course, where there is a ceremony of great general interest, a good photograph might still score in this way, but it would be altogether a problematical business.

No. We strongly advise our friends out of London to do what they can to make money out of their local friends. Here they will be on safe ground; they ought to know their probable patrons' taste, and, as men of business, endeavour to cater for it. There are few towns where there will not be some municipal public act, and it is very certain that a photograph, including local dignitaries, whose portraits may be recognised in a group or street picture, is one for which a considerable sale may be expected.

We believe there are many towns where preparations are being made to bring out large pictures of corporation officials mayor, aldermen, and councillors, and so forth. This is a difficult class of work on a large scale; but, from all we can gather, it is, when well carried out, usually a source of considerable pecuniary gain; and there is always the eternal presentation and public ceremonial in connexion with new buildings, their foundation-stone-laying, or their opening ceremony. It is here where the smart man of business comes in to advantage. We have held many conversations with photographers from all parts of the country upon this topic, and they all unite in saying that, given a good picture, with a number of portraits in it, and there is bound to be a good sale this notwithstanding what we have said as to the moribund state of the photograph sale trade. The feeling, indeed, among these experienced business men seems to be that a crowd of portraits is the best telling photograph it is possible to take.

Here, then, is where Jubilee business in the provinces has most probable chances of success, and here we will leave the subject after a few practical hints on such work.

Where there is, in a ceremonial to be photographed, some celebrity taking part, the first thought will naturally be to make him the central object in the picture; but this must be done with considerable discretion to let us see what it means. All eyes, and consequently all heads, in the crowd will be turned towards this principal performer. The inevitable consequence will be that, although a good picture may be taken of this centre of interest, the crowd—the possibly paying crowd, be it remembered—will, unless great care be taken in choosing a suitable standpoint, be represented by an assemblage of hats and back hair. Now, no one wants a picture of his hat or of his back hair; except for the possible sale to the owners of the few faces taken, the photograph will be a dead failure so far as sales are concerned, unless such a view be taken as will fairly show the centre of interest, and, associated therewith, a goodly number of human countenances.

Photography *versus* Oil Painting.—Allusion is made below to the fact that oil paintings change with time, and sometimes in a comparatively short one too. This is not necessarily the case with a photograph. A striking illustration of this is to be seen in the Imperial Victorian Exhibition at the Crystal Palace. In the Photographic Section is a photograph, *The Royal Family at Windsor*. In the Greek Court, on the opposite side of the nave, is the original from which it was copied. This is a large picture produced some years ago by the late Mr. Lachlan M'Lachlan for the express purpose of being reproduced by photography. It is of large size, and is painted, in oil colour, in monochrome. It will be noticed that the high lights and delicate portions have become degraded and yellow through the changing of the vehicle used in the colour. The photograph, a carbon print, made, we believe, soon after the picture was finished, is as bright and fresh as at first. Any one with a photographic knowledge, seeing the original as it is, will at once recognise that it would be impossible to get from it such a reproduction as that shown in the Photographic Section.

Poisonous Fumes.—A serious fire has happened at the Schering Chemical Works at Berlin, where probably the larger proportion of the pyrogallic acid used in this country is manufactured. The cause assigned is the bursting or breaking of a carboy of nitric acid, followed by the breaking of several others. Unfortunately, the firemen, while engaged in extinguishing the fire, suffered severely from inhaling the fumes from the acid and other chemicals; ten were made seriously ill at the time, and one has since died. A later telegram (Reuter's Agency) says that, although only ten men appeared to be affected at the time, three officers and no less than fifty-seven men have since become seriously ill. We have in mind a similar accident with nitric acid, and injury to firemen through inhaling the fumes from it, that happened a few years ago in this country, namely, at Messrs. Mawson & Swan's warehouse at Newcastle-on-Tyne. Photographers nowadays have very little occasion for strong nitric acid, but those who have should be careful as to its storage, particularly in hot weather, if the bottles are securely stoppered.

Portraits of the Queen.—Her Majesty, on hearing that the police force of the island of Grenada were subscribing towards buying a portrait of herself for each of the district offices, as a memento of her sixty years' reign, has been pleased to present seven photogravures, with her autograph upon them, to the seven stations, where, it is needless to say, they are much appreciated. We believe the Queen has had a large number of photogravures of herself done for her personal use. Her Majesty has always recognised the instability of silver prints, and in her private collection she has had many of the earlier photographs, in silver, reproduced in platinum and carbon. In future, no doubt, when a number of pictures are required, photogravure will be the process adopted. By the way, portraits of the Queen, of all sizes and styles, are to be seen everywhere—the majority of them by photo-mechanical processes. In those given away, as supplements to the various papers, it is curious to note the marked difference there is in the likeness between most of them. So great is this, that one may almost ask how many queens there are.

The Jackson-Harmsworth Expedition.—On Thursday, last week, the Arctic ship, *Windward*, started on her third voyage to the North Polar Region of Franz Josef Land. This vessel has twice made the voyage and returned safely, which no other vessel has yet succeeded in accomplishing. She took with her a large stock of stores for the explorers who are still there; they include all manner of things, beyond the absolute necessities of life—photographs, Christmas cards (for next Christmas), novels, and, of course, cigars and tobacco, as well as wine for their comfort, &c. The *Windward* also took with her a folding boat, lighter than any other known collapsing boat, which was destined for Herr Andrée's use should he happen to find his way to Elmwood, also a considerable quantity of oil, especially for Herr Andrée's use. These stores will be put into a hut and carefully secured if the members of the English explorers remove from Elmwood. Last year it will be remembered that Herr Andrée intended to explore the northern regions in a balloon, but the elements were against his starting. This year he intends to make another attempt, and the result is looked forward to with interest in the scientific world.

Silver Prints.—The never-ending topic—the relative permanence of silver prints—is again to the fore. Letters have appeared in our columns for the last few weeks, and the subject also cropped up at the last ordinary meeting of the Royal Photographic Society in connexion with photographic surveys, and the necessity of having the photographs produced by a permanent process. It was then argued that, because some bromide prints had not faded, it was not conclusive evidence that they were permanent. Albumen prints, forty years old, are in existence that have not faded, but it must not be taken as evidence that they are permanent. What is permanent? An engraving, say a line engraving from a steel plate, changes with age. The ink sinks into the paper, and the paper itself acquires a tint, and in the eyes of connoisseurs improves, becomes "mellowed." That shows that engravings are not unchangeable, and it is well known that oil paintings undergo a change, some in a few years.

With reference to the stability of silver prints, our correspondent, "A Veteran Photographer," touches upon a very important point when he says "collodio-chloride prints, I find, if *firmly*, say deeply, printed from negatives that give good platinum or carbon photographs thoroughly fixed and washed, will stand good for many, many years, whereas those, I am afraid, from thin, ghostly negatives will go light very soon." There is no question the negative is an important factor in the permanence of the print, a point too often overlooked. It will be found that in most instances, if not in all, those prints that have withstood the test of time for thirty or forty years were made from what would now be termed *very* vigorous negatives, *i.e.*, the shadows, clear glass, and the high lights, very dense, so that the image was formed of a good body of silver when printed. That is a condition that cannot exist when "ghostly negatives" are used, whatever paper, whether albumen, gelatine, or collodion, be employed.

SPECTRUM PHOTOGRAPHY FOR EVERY-DAY USE.

Now that orthochromatic photography and three-colour work have come so much to the front, spectrum photography has passed from the domain of the purely scientific experimentalist into that of the every-day worker, and has, in fact, become almost a necessity in the studio of every photographer who habitually uses colour-sensitive plates or colour screens. But the majority of these regard the process of photographing the spectrum in order to analyse the capabilities of their sensitive films or colour filters as a task altogether beyond the powers of the ordinary worker, and remain content to rely upon their visual examination by means of the spectroscope, which they consider all-sufficient.

But, although the simplest pocket spectroscope or even an ordinary prism may be a very valuable assistance, it falls very far short of supplying all the information required, and may, in fact, under some circumstances, be actually misleading; and, to repeat what I have already said, a ready means of photographing the spectrum is almost a necessity, as being the only plan by which the real colour values of sensitive films or screens can be accurately gauged.

As for the difficulty of the operation, this is very much exaggerated. Of course, in the higher branches of spectrographic work it is quite true that instruments and apparatus of a delicate and costly character are a necessity; but, then, for the purposes of every-day work, we have not to deal with those higher branches, and correspondingly simpler means and materials will suffice for our purpose

Thus the three-colour operator only wants to know, with a fair degree of approximation, what regions of the spectrum his films are sensitive to, and which portions his filters transmit and which they suppress. He has nothing to do with wave-lengths, and can afford to let the Frauenhofer lines alone, except so far as a knowledge of their position is a guide to him, for they form the immovable boundary marks by which his measurements and comparisons are made. But it is not necessary, even if he have the means, that his spectrographs should show the Frauenhofer lines with perfect sharpness, or even at all, if he can locate the position they ought to occupy; all he requires is a continuous spectrum, showing the relative amount of action in different parts, and this becomes an increasingly difficult task if only from the increase of exposure, if any attempt be made to obtain the solar lines.

But he must possess or devise the means of accurately locating the principal lines, after which, whether his exposures be made by natural or artificial light, their absence will be of no consequence. This want is supplied by a chart or spectrograph showing the lines, if only with moderate sharpness, with which subsequent exposures may be compared; but it is important that this reference chart be made with the actual apparatus used, and under conditions which render it trustworthy for its purpose. It is quite useless to attempt to fall back upon the coloured diagrams to be found in the various text-books, as they are, under the circumstances, perfectly meaningless, and, moreover, perhaps no two of them are absolutely alike. But the required conditions are very easily fulfilled, as I shall endeavour to show.

Any one who possesses a pocket spectroscope has nearly all that is required for the purpose. All that remains is to provide some means of attaching it to the camera front, so as to occupy always an invariable position. This point is important, as on it depends entirely the accuracy of future comparisons with the reference spectrum. If the instrument be affixed to an immovable front—immovable, at least, in the direction of the *length* of the spectrum—the latter will always, and under any circumstances, occupy the same position; and a representation of the principal Frauenhofer lines once obtained, it will serve as a thoroughly reliable gauge for all subsequent exposures. If the camera front be formed of fairly thick wood, or if a block be glued on and carefully bored, it will not be a very difficult operation to fit the eye end of the spectroscope tube into the hole with sufficient accuracy to exclude extraneous light, the eyepiece flange—for there is really no eyepiece—being just removed. But I may mention that a camera spectroscope has been devised for this special purpose by Messrs. A. W. Penrose & Co., that serves the purpose of an ordinary direct-vision instrument, and is provided with a flange by which it is attached to the camera for photographic work. It is made, I believe, in two sizes, which differ in the amount of dispersion they give.

In using the direct-vision spectroscope for this purpose, every requirement of ordinary work is amply fulfilled, and more; and, except in duration of exposure, photographing the spectrum differs in no way from the taking of any other photograph; but, if the instrument is provided with an adjustable slit, it will render the Frauenhofer lines with the greatest ease, and with a very fair degree of sharpness; but the latter point will, of course, vary with the degree of magnification, or, in other words, the distance to which the camera is extended. In some measure, the camera extension will depend upon the distance to which the focussing tube of the spectroscope is drawn out; but there are limits beyond which the movement of the slide results in loss of definition altogether. The general rule of conjugate foci will be observed; the further the focus tube is drawn out the shorter will be the camera extension, and *vice versâ*. The greater the camera extension the longer, as well as broader, will be the spectrum produced—in fact, the more it will be enlarged, and, as a consequence, the larger the spectrum the less sharp will be the definition, however carefully the focussing may be effected.

Here the dispersive power of the train of prisms will have a great influence, and, speaking in a general way, I think better definition is obtained over a longer spectrum by using an instrument of greater dispersive power than when the length is got by extending the camera; but, if a shorter spectrum will satisfy, then finer definition will result from the instrument of lower dispersive power. For instance, with the camera spectroscope referred to, containing a train of five prisms and a camera extension of about fifteen inches, I obtain a spectrum measuring a trifle over two and a half inches between the D and H′ lines, and extending more than an inch beyond the latter into the ultra-violet region. In the visible portion of the spectrum, between twenty and thirty lines are distinctly shown, though the principal sharpness is about E, and the crowded region round G is somewhat lacking in definition. With that particular instrument I have not reached below D, but with a three-prism train and greater camera extension I have made a spectrum that reaches from B, or rather below it, far into the ultra-violet, and measures nearly the length of a quarter-plate.

It will be seen from this that for ordinary testing the direct vision spectroscope is more than sufficient, as for such purposes it would be folly to screw down the slit until the lines were sharp, and extend the exposure, perhaps, to hours with collodion plates, when every requirement would be fulfilled with the slit at perhaps a twentieth of an inch. My experience, so far, has been chiefly with collodion emulsion with which, although it is easy to get down as low as D, showing all the lines sharp, it requires an exposure of half an hour or so; but, to get into the red region with the best red-sensitive emulsion, I have yet made means at least a couple of hours with the slit screwed down close enough to give sharp lines.

But for practical purposes one experience of that sort in making the reference spectrum will be sufficient. For this purpose, however, a gelatine plate had better be used as being quicker, and it may be borne in mind that, as the result is only required to show the *position* of the lines, the relative intensities of the different parts of the spectrum may be ignored and various exposures given through different screens in order to obtain the desired effect. I had omitted to mention, though it scarcely needs it, that it is impossible to get a complete spectrum from red to violet, or ultra-violet, in one straight-away exposure, either without a screen or with one single screen. Some part of the spectrum is bound, under such circumstances, to be overdone. The following is the plan I adopted with collodion emulsion, and with suitable modifications I have no doubt it would be equally effective with gelatine.

The plate, colour-sensitised with eosine and cyanine, was first exposed without any screen for twenty minutes, the slit screwed down as close as possible, the source of light the clear sky. Next, a similar exposure was given through a yellow screen in order to give the region between E and F a chance, for the green is always the weakest portion of the spectrum, and it is not improved by the presence of cyanine. A longer exposure through the yellow screen would have been advantageous for the green region, but would have overdone the yellow, which already had the benefit of both eosine and cyanine. Finally a two hours' exposure was given with a screen of methyl violet, which cuts out the whole of the centre of the spectrum and leaves the action entirely in the red and violet, neither of which is in danger of getting overdone. The result, though weak, generally from E to nearly G, is sufficiently complete as a reference chart.

Perhaps a better plan would be to treat the two ends and the middle of the spectrum separately—to, in fact, have three separate charts. With eosine and picric acid a continuous spectrum is obtained from beyond H H′ down to D, where it stops sharply. This gives the maximum of action between D and E and up to F, from which point it grows weaker owing to the slowing action of the picric acid. This would give the chart for the green and yellow region. Blue, violet, and ultra-violet would be rendered by an emulsion sensitised with quinine, and the red and orange with nigrosine. I am referring, of course, to collodion, for I believe with gelatine it would be easy enough to get the result on one plate; but with collodion the ratio of sensitiveness between the blue and red rays is almost too great.

I have allowed these remarks to run over more ground than I intended, but I hope I have made my intention clear, namely, to show that the practical application of photo-spectrographic tests is well within the capabilities of the ordinary photographer.

W. B. Bolton.

ON THINGS IN GENERAL.

As a large part of the British world will be wending its way Londonwards in the Jubilee week, we might expect that there would be such a lull in photographic business that employers might fairly be expected to give their various *employés*, after the manner that has been happily initiated by a large number of heads of businesses, a holiday. As, however, we may expect that the Jubilee Day itself will afford plenty of special work, it could hardly be expected that a holiday could be afforded on the day itself; but I think a day's holiday, with a day's pay, would be a very acceptable boon to a large number of hard workers, and at a time of the year when photographic work is very apt to "take it out of one," as a printer recently put it to us. Now, who will take this hint, professional portraitists, landscapists, plate-makers, paper-makers, *et hoc genus omne?*

I hope my mention of plate-makers will not so arouse the ire of some plate-users as to direct their thoughts from holiday-giving to what still appears to be a burning topic. The makers are just now having a hot time at their various customers' hands, but eventually matters will find their own level. One is reminded of the cabby's reply to an abstrusely mathematical question put by Artemus Ward to him, asking which alternative he would choose. "Well," said Jehu, "there's a deal to be said on both sides." There cannot be a doubt that the new arrangement will fall rather heavily on the small user, particularly when possibly his next-door neighbour may be a dealer who does a little professional work on his own account. Whenever there are any special 'plums' giving views, processions, public functions, &c., and, when the said small man expects to make a haul, he is naturally angry when he finds he is forestalled by a dealer who has plates bought at dealers' prices. This, he feels, is 'adding insult to injury.'"

I noted a very pertinent question put at a recent meeting of the London and Provincial Photographic Association. Mr. Bayston asked if any one had tried copying as a positive a grossly underexposed negative which had been bleached with mercury. Now, to the best of my belief, this plan has been recommended by a writer in these pages, about a quarter of a century ago. I know that I have done it myself, and with advantage many times. It is an excellent plan, the only difficulty being, that with dry plates with minimum exposure there is such a tendency to use excess of ammonia in developing that the negative is usually much veiled, a condition that is fatal to good results. I may mention that ordinary glass positives and whitened dry plates give splendid printing negatives when properly copied, a fact quite contrary to usually received notions.

It is perhaps worth while replying to the inquirer, "Salted Paper" (see Answers to Correspondents, May 28), who inquires where he may get the old-fashioned plain salted paper, a term that carries one back to the prints of forty years ago. If only a few occasional pieces of the paper are wanted, the correspondent in question cannot do much better than use albumenised paper, sensitising the back of the sheet instead of the albumenised side, and floating for about a fourth of the time needed for the albumenised side.

I find myself already giving two references to "old-world" photography, and now I am about to make a third. I have not tried the Novitas paper, under the new name at any rate, but I have a very distinct recollection of purchasing a special albumenised paper (as far as I can remember, about thirty years ago), which possessed all the requisites alleged to be proper to Novitas paper. I believe it was sold by a firm called Squire & Co., or some very similar name. It had to be printed very dark, and when toned and fixed, and put in hot water, the albumen floated off, and could be transferred to any required other surface, leaving behind the original support with a slimy surface. I have not seen any of it in commerce for very many years past.

Another correspondent has been writing about Cresco-fylma, and the impossibility of keeping it in glass bottles. It is quite true that a gutta-percha or a leaden bottle is the proper thing to use, but they are difficult to get, and cost much more than glass. It is quite possible, however, to utilise a glass vessel by a very simple expedient. Let a small piece of paraffin wax be dropped in the bottle, and the latter corked and placed in a hot oven or in front of the fire till the wax is melted. If the bottle, still hot, be held by the cork, and turned round and upside down till the whole of the inside is coated with paraffin, it will be capable, when cold, of safely holding the corrosive liquid for an indefinite period without any action upon the glass.

It may be noted that, in recent and many earlier similar discussions upon the keeping properties of bromide prints, one most valuable piece, or, I might say, some scores of thousands of valuable pieces of readily obtainable evidence, though at the hands of every intelligent photographer, seems to have been entirely lost sight of. I refer to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, few issues of which for many years past have been without at least one example of bromide printing. Judging by my own copies, though some of the illustrations do not leave much to be desired, others are, to put it mildly, startling. The issue of these thousands of pieces of evidence certainly shows an amount of confidence in their producers which approaches the sublime.

What can the writer of the article on "Photographers' Windows" mean by suggesting to those whose business leads them into the way of taking wedding groups that they should also take a single picture of the bride? Does there exist a photographer so blind to business as not to try to secure such a picture? But at the same time, be it said, the writer can have little practical acquaintance with this branch of the subject. Any one who has had the photographing of wedding groups knows very well that even to get sight of the bride is no mean feat, while to get her and her party within range of the camera needs a number of mental qualifications rarely to be found combined in one man. He must, above all, be resourceful; he must be patient, bland, firm, or yielding at the critical time; he must have a front of brass, and a countenance as much under control as his temper, and he must be as brave as a lion. Given all those qualities, he may perhaps succeed in getting his group together for a space of time extending perhaps even to five minutes, with all the time some persistent subject with watch in hand ready to call out "Time's up!" Talk of also getting the bride alone; let him ask for the moon!

FREE LANCE.

FOREIGN NEWS AND NOTES.

Dark Light.—Professor Perrigot, of Lyons, has an article in the *Photographisches Archiv* and the *Correspondenz*, offering a solution of Dr. Gustave Le Bon's experiments, upon which are based his theory of dark light. A plate is veiled by pre-exposure and then placed under a sheet of ebonite in a printing frame. Pieces of zinc plate, of various shapes, are fastened to the outer surface of the ebonite, and the frame is then exposed to diffused daylight for about three hours. Upon development, a picture of the metal plates is obtained, and it is more intense than the veiled ground. Le Bon's theory is that the dark light present in ordinary light is so changed by the metal, that it penetrates the ebonite, which is opaque to ordinary light. Professor Perrigot repeated the experiment with the same result, but, by substituting an unexposed for a veiled plate, the pictures of the pieces of metal were transparent upon a dark ground. The thickness of the ebonite plate was then partly reduced, and another small piece of ebonite fastened upon the unreduced portion. With a veiled plate, the image of the reduced area was light, and that of the doubly protected area dark, upon a grey ground. With an unexposed plate, the reverse of this effect was obtained. Professor Perrigot contends that these results are quite consistent with those of ordinary exposure and reversal. Ebonite is pervious to light. The exposure reverses the portions of the veiled plate not protected by the pieces of metal, and, in the case of plates that have not been previously exposed, the pieces of metal afford additional protection, and produce a transparent image upon a dark ground, caused by light traversing the ebonite. The theory of "dark light" is consequently superfluous.

Reversed Negatives.—For effecting the transfer, Professor Lainer gives the following supplementary directions to those reported on p. 325 of this JOURNAL from the *Photographische Correspondenz:* If the edges tear slightly at starting, the film should be cut through with a penknife at a little distance from the edge. Remove the outer edge, and again immerse the plate successively in the formalin and the acid baths. After the film is stripped it must be turned

over in the acid bath and adjusted to the glass support with greatest precision. Any readjustment must be made in the bath. The plate is then transferred to blotting-paper and a sheet of gutta percha laid upon the film. Air blisters are removed by passing an indiarubber roller over the gutta percha, working from the middle to the edges. If any remain near the edges, they may be pressed out with the finger, but the rolling should be repeated. The back of the plate is then wiped, and the surface of the film mopped with a wad of linen. The negative should then be stood up to dry, without applying heat. If the edges of the film overlap the plate, cut them away with scissors, otherwise the film may not adhere. Fifteen to twenty c. c. of glycerine should be added to the acid bath, as it helps the film to adhere to the glass. To obtain thin negative films, strip the plate as already directed and transfer to glass prepared with wax. A concentrated solution of wax in ether, thinned with an equal quantity of ether, is used for the purpose. This is poured upon the plate, which is then polished with a wad of flannel, and coated with enamel collodion. The negative is transferred to the dry-collodion plate in the acid bath as already directed. After drying it may receive another collodion coating, but the superfluous collodion should be poured back from the opposite corner. The edges are cut through with a penknife on the following day, and the film may then be stripped.

Washing Negatives.—We recently gave the results of some experiments by Gaedicke with reference to the elimination of hyposulphite of soda from negatives by repeated changes of water, instead of a constant flow. After a good rinsing, six to seven changes, at intervals of five minutes, were found sufficient, although the plates were only covered to a depth of one centimetre. Reverting to this subject, Gaedicke gives, in the *Photographisches Wochenblatt*, the results of further experiments with plates that had been alumed after fixing. It was assumed that the plates had a tendency to frill, and that it was necessary to transfer them to the alum bath as quickly as possible to save them. After a good rinse, to remove the hyposulphite from the surface, the negatives were immersed in a saturated alum bath for three minutes, then rinsed, and given successive changes of water, as in the previous experiments. The amount of hyposulphite removed by each washing water was determined by titration with an iodine solution, as before, with following results:—

Number of Water Bath.	Time of Immersion.	Amount of Hyposulphite of Soda.
1	5 minutes.	0·018 grammes.
2	5 ,,	0·006 ,,
3 and 4	5 ,,	Each 0·003 ,,
5 and 6	5 ,,	Each 0·002 ,,
7	15 ,,	0·002 ,,
8 and 9	Each 7½ ,,	Each 0·002 ,,
10	60 ,,	0·004 ,,
11 to 18	Each 5 ,,	Each 0·001 ,,
19 to 23	Each 5 ,,	Each 0·0005 ,,
24	5 ,,	0·0000 ,,

It is evident that a film tanned with alum retains the hyposulphite very stubbornly, and that after the sixth bath a considerable quantity could be removed. The time occupied in washing was three and a quarter hours, against half an hour with a plate not alumed. During a period of three hours some sulphur must have been precipitated in the film by the alum from the hyposulphite, which would not be conducive to permanency. Instead of alum, Gaedicke recommends a concentrated solution of common salt for the prevention of frilling. This does not tan the film, the negative may be transferred to it direct from the fixing bath, and the subsequent washing is not prolonged.

Chassagne's Colour Process.—Dr. Eder publishes a few admonitory remarks in the *Photographische Correspondenz*. No further information has been supplied to him, although Chassagne's representative had expressed willingness to give a demonstration of the process, which, however, has not been done. Those who have made inquiries at the Vienna Technical Institute, with a view to purchase, have been recommended to await the results of this demonstration. The patent specification recently published veils more than it discloses. Spectroscopic examination of the pictures gives no tangible results, as the absorption spectra of such dyes are not nearly so characteristic as the emission spectra of the elements. Chassagne does not, however, make any other claim of invention than that of colouring a silver print by chemico-physical means. Dr. Eder sent the prints in his possession to Dr. Vogel and Dr. Aarland, at their request, as they were unable to obtain specimens. These experts agreed with Dr. Eder that we must await the course of events before arriving at a decision concerning the Chassagne process; but Dr. Eder adds that Chassagne's long silence, his insufficient patent specification, and the delay in submitting his process to objective test must influence public opinion to his disadvantage.

Fine Focussing Screens.—The *Photographische Rundschau* gives the following directions for making fine focussing screens for microscopic work: Fix an undeveloped, waste dry plate, wash, and dry it; saturate this film of clean gelatine with a solution of chloride of barium and then immerse it in a saturated solution of alum. A very fine precipitate of barium sulphate is produced in the film and gives it a milky appearance. Wash thoroughly and then dry.

Collodio-chloride Paper.—In Eder's *Jahrbuch* Herr Haimeke gives the following method of preparing celloidine paper. Baryta paper, as sold by Rives, should be used as a support. The particular formula which he recommends for the emulsion is—

I.

4 % celloidine collodion	670 parts.
Ether	70 ,,

II.

Lithium chloride	1·8 parts.
Strontium chloride (cryst.)	2 ,,
Citric acid	4 ,,
Distilled water	10 ,,
Alcohol	65 ,,

III.

Silver nitrate	22 parts.
Distilled water	24 ,,
Alcohol	150 ,,

In Solutions II. and III. the salts should be dissolved in the water by the aid of heat, and then the alcohol added. The silver solution should be added to the collodion, and then the chlorides, shaking well all the time, and a little glycerine and castor oil should be added to the emulsion. The above formula is suitable for winter work, but in summer it should be somewhat thinned by a mixture of 2 parts of alcohol, and 1 part of ether, the exact amount being determined by experiment, the main idea being to obtain a collodion which will flow easily.

Titles to Collotype Plates.—In the *Photographische Mittheilungen* the following is recommended for the purpose of adding titles, signatures, &c., to collotype plates. A small quantity of uranium nitrate is dissolved in ordinary writing ink. The signature is written upon paper, not too thickly, and pressed a short time upon the moist film. The uranium nitrate hardens the gelatine, and renders it capable of taking on a fatty ink. White spots, produced by defects in the negative, may also be removed with ink prepared in this way.

Intensification with Bromide of Copper.—The following appears in the *Photographisches Archiv*. A very energetic process of intensification for finished negatives consists in treating the plate with bromide of copper, and, after slight washing, with nitrate of silver. The chemistry of this process has not yet been fully explained. The metallic silver is bleached by the cupric bromide, and bromide of silver (or the hypothetical sub-bromide of silver) and sub-bromide of copper are formed. Owing to want of solubility during short washing, the latter remains with the bromide of silver in the film. When treated with silver nitrate the sub-bromide of copper should reduce a quantity of silver equivalent to that which was at first in the film; but the strength of image indicates a much larger quantity. Rose has investigated the influence of cuprous oxide upon silver nitrate. The solution became blue, and the red cuprous oxide was replaced by a voluminous grey mass. Rose suspects in the latter a mixture of metallic silver and basic nitrate of copper. Paul Labatier has recently confirmed this (*Comptes Rendus*, February

1897) after having first believed that the silver was present, at least partially, as a compound. The decomposition is represented by the following equation:—

$$6AgNO_3+3Cu_2O=6Ag+3CuO_2Cu(NO_3)_2+2Cu(No_3)_2.$$

Photo-mechanical Lantern Slides.—In Eder's *Jahrbuch* Herr Speer states that there are many cases in which lantern slides may be useful for technical lecture purposes, and that they may be easily prepared by any photo-mechanical process, such as zinco, litho, photogravure, or collotype. The support for the image is a sheet of gelatine prepared as follows:—35 parts of the finest collotype gelatine is allowed to soak in 600 parts of water, and then dissolved by the aid of heat. 8 parts of glycerine and 16 parts of glacial acetic acid being added. Sheets of plate glass should be well cleaned and polished with French chalk, and then coated with the above mixture, 10 c. c. being allowed for every 100 square cm. of surface. The film should be allowed to dry for twenty-four hours and then stripped, and on these sheets pulls may be taken by any of the above-mentioned processes, and then cut up to the required size and mounted between lantern-slide cover glasses.

THE WASHING OF GELATINE FILMS.

[Abstract from Eder's Jahrbuch.]

The diffusion of hyposulphite of soda through gelatine membranes is of special interest to photographers, and an accurate investigation of the subject was made, which confirmed the work of Messrs. Haddon and Grundy.

Three questions were investigated.

1. In what quantities does sodium hyposulphite diffuse through a gelatine membrane into water—(*a*) with various strengths of solution; (*b*) with an upward diffusion; (*c*) with a downward stream?

2. How does a solution of hypo diffuse through a gelatine membrane into solution of common salt?

3. Does gelatine take up the hypo solution in different strengths?

The diffusion apparatus consisted of a strong glass tube of 8·75 mm. internal diameter, and this was covered at one end with a sheet of gelatine swollen in water, of a thickness of 3·27 mm., which is about four times as thick as the film of a dry plate. The hypo was quantitatively estimated by a titrated iodine solution, and a two per cent. solution of arrowroot starch as indicator. A twenty per cent. solution of hypo was made, and this diluted as required. The temperature of the laboratory was kept constant at 17·5° C.

The first series of experiments were made by placing the hypo in the outer vessel, and the diffusion tube suspended in this, and filled with distilled water to the same level as the solution in the outer beaker. It was found that during the hour no hypo had diffused into the inner vessel, which was ascribed to the fact that the gelatine had not become saturated with hypo, and therefore in all the experiments the first hour was ignored.

Experiment I.—In the outer vessel a two per cent. solution of hypo was placed, and the inner diffusion vessel filled to the same level with distilled water, so that the hypo would diffuse up through the gelatine. In thirty-six minutes 0·001 gramme of hypo was found in the inner vessel, in an hour 0·002 grammes. In fifteen hours 0·006 grammes of hypo diffused, not fifteen times as much, but only three times as much. When allowed to stand undisturbed, it is thus seen that the diffusion is very slow, and a film of hypo solution of the same strength as in the outer vessel rests on the film and prevents further diffusion. In order to prove this, the inner vessel was emptied every five minutes for half an hour, and the six waters contained 0·003 gramme of hypo, in fact three times as much as in the previous thirty-six minutes, and half as much again as in an hour when the water was not changed.

Precisely similar conditions would occur when fixing a plate in a dish. Diffusion would take place immediately, and above the gelatine would be a layer of hypo solution, which would stop further diffusion.

Experiment II.—The above experiment was repeated, using a five per cent. solution of hypo. At the end of the first hour 0·003 gramme of hypo, and in the second and third hour 0·004 gramme, diffused or double as much as in the weaker solution.

Experiment III.—When a ten per cent. solution of hypo was used, 0·007 gramme diffused in the second and third hours.

Experiment IV.—When a twenty per cent. solution was used, in the second, third, and fourth hours 0·008 gramme diffused, whilst in the fifth hour, if the water in the inner vessel was stirred, 0·010 gramme diffused.

From these experiments it is evident that the quantity of salt which diffuses in a given time is greater the more concentrated the solution is, but the increase is not proportional to the increase of concentration of the solution. The advantages of keeping the water moving is shown from Experiment IV.

To test the diffusive power of hypo downwards, the following experiments were made with the hypo solution in the inner vessel, and the water in the outer.

Experiment V.—A twenty per cent. solution was used, and in an hour 0·017 gramme had diffused. In fourteen hours 0·167 gramme diffused, corresponding to an hourly diffusion of 0·012 gramme, which proved that gradually the diffusion decreased, which was due to the difference in strength of the two solutions becoming more equal. This proves that for washing plates it is not advantageous to allow the plate to remain in the one water too long.

Experiment VI.—This was to determine the diffusion of hypo in concentrated solution of common salt, and it was exactly on the same lines as No. V., only that concentrated solution of salt was placed in the outer vessel. It was found that there was a noteworthy increase in the diffusion; in the first hour there was 0·015 gramme, in the second 0·012, and in the third 0·009 gramme diffused. The decrease in the rate of diffusion was found to be due to a layer of the lighter hypo solution lying underneath the gelatine, and thus preventing the further diffusion.

Further experiments with the solution of salt were made, and the conclusions arrived at are that a plate can be more readily washed, film up, in a solution of salt than in water, as the lighter hypo rises and gives place to fresh salt water. From Experiment V. it is obvious that plates will wash much more quickly if placed film downwards or upright, as in both cases the diffused hypo sinks to the bottom of the vessel and makes room for fresh water.

In order to decide whether the gelatine film took up a definite quantity of hypo, or whether the quantity changed with the concentration of the solution, several experiments were made, but without very conclusive results.

Herr Gaedicke deduces the following conclusions from his experiments:—

1. The quantity of hypo which diffuses in a given time is greater the more concentrated the solution; but the two are not proportional, the diffusion increasing more slowly.

2. The diffusion upwards, which is but little, is considerably slowed as time goes on when the water is not kept in motion, in that the heavier layers rest on the membrane and only slowly diffuse.

3. When the diffusion is upwards, it is greater where the water is kept in motion.

4. When the water is changed every five minutes, three times as much hypo are extracted as when it is changed every half hour.

5. When the plate is placed face downwards or upright in the water, the quantity of hypo eliminated is about double that when the film is placed upwards.

6. It is not advantageous to leave a plate in the same water too long.

7. In a concentrated solution of common salt, the hypo diffuses upwards, and therefore a better washing takes place with the film up.

8. Gelatine takes up the solution of hypo in one concentration.

J. Gaedicke.

THE ENAMEL PROCESS ON ZINC.

[Translated from the Photographische Correspondenz.]

After the American enamel process had become so deservedly popular, and had been worked out by experts upon copper in its various modifications (fish-glue, Cologne glue,* metagelatine,† &c.), attempts were soon made from many sides to adapt the process to the cheaper metal, zinc.

The difficulties standing in the way of the process upon zinc were to be found principally in the fact, that the structure changed and became crystalline at the temperature necessary for burning in the glue picture, and consequently good results were not attainable with the usual etching processes. To avoid this difficulty, it was necessary to produce a film of enamel upon zinc at a lower temperature, or to find a modified etching process that would properly etch the zinc in its altered condition. A number of attempts were made in both directions.

In addition to the published enamel processes, the so-called cold-enamel processes were offered for sale from various quarters; but, notwithstanding their extravagant advertisement, they were not adopted permanently in

* Valenta, *Photographische Correspondenz*, 1895, p. 339.

† V. Turati, *Photographische Correspondenz*, 1896, p. 101.

practice, as it is impossible to attain the resisting power of the burnt-in enamel by any cold process.

The first publications relating to the enamel process upon zinc and its difficulties were by Wilkinson, in 1893,*, and W. Sicker in 1894.†

Husnik,‡ recommended a primary etching of the zinc with—

Nitric acid	1 part.
Alum	1 ,,
Water	20 parts.

The plate was then prepared as usual with bichromated glue, the image stained with an alcoholic solution of dye, and etched after burning in.

Another proposal was to pour a stained solution of shellac (in chloroform and benzole) upon the image, and, after ten minutes' washing, to develop with a wad of cotton-wool. Husnik remarks: "The heating of the zinc plate is avoided, but the etching is coarser."

Concerning the action of dyed resinous solutions further detailed account is given below.

Liesegang§ recommends a somewhat tedious variation of the etching process, whilst it should be sought to hasten the process by etching for the shortest time possible.

Another formula‖ contains chrome alum, but is otherwise the same as the process upon copper.

The *Photogram* (1894, July and following numbers) treats of the zinc-enamel process, but does not contain much that is new. It attributes failure to impurities in the zinc, namely, presence of lead.

The *Photographische Correspondenz*, 1895 (pp. 57 and 106), contains a polemical treatise upon the zinc-enamel process, but no special technical directions are to be gathered from it.

Mac Farlane Anderson¶ describes a new idea. Resin is saponified, and the aqueous solution neutralised. He adds some of this solution to the preparation of fish glue, and a small amount of heat is then sufficient to produce a resinous resist.

Hyslop describes a similar process dependent upon fine resinous emulsions.

However beautiful all these processes may appear at first sight, they are of little importance in practice, as the writer has proved by a large number of exhaustive experiments in these directions. It was found possible, even with plain chromated resinous soap to obtain an image that adhered with gentle heat and afforded complete protection against acids.

Colin Campbell** recommends instead of fish glue (which requires so high a temperature in enamelling that the zinc is modified) other substances that give a good enamel at a lower temperature; these are obtained from aquatic plants and seaweeds.

H. Müller†† published practical experiences with these substances (carrageen moss), and they gave him good results.

G. Fritz‡‡ published in a paper, read before the Vienna Photographic Association in 1895, his experiences of the zinc-enamel process. Preparation, printing, and development present nothing new in comparison with the enamel process on copper, excepting that twenty-five per cent. more water is used for the coating, because, according to the author, zinc is more porous in comparison with copper, and does not take the glue as well; but, in burning in, G. Fritz does not go above 150° C., at which temperature the dye disappears and the film turns yellowish. At this temperature enamel is not formed (fish-glue enamel requires a temperature of 280° C., and the colour then turns to chocolate-brown). For this reason a modification of the etching process is also requisite. Therefore, according to the image, the etching is from three to five minutes with 5 grammes of nitric acid and 400 grammes of alcohol, forty per cent. The plate is then inked up and immersed for about five minutes in a two to three per cent. aqueous etching bath, and finally for two to three minutes in the first alcohol and acid bath. The process takes from thirty to forty minutes, and is said to give faultless results. The alcohol in this process plays the part of a protecting agent to the glue film, which is easily attacked by water.§§

Otto Müller‖‖ published in July, 1895, his experiences of the zinc-enamel process. His method of preparation was the same as above, excepting that Müller used fresh instead of dry albumen. The development is carried out after coating with a stained solution of resin in chloroform and benzole.

The solutions of resin which we have already met with in a process by Husnik, as described above, serve the purpose of forming a resinous permeable covering to the glue print; that is to say, the watery developer has to make its way to the glue by passing through the resinous film, at the same time dissolving the particles of dye. The unexposed glue then begins to swell and breaks up the superimposed layer of resin, which has become friable, and it is then gradually set free by the watery developer. Gentle friction with a wad of cotton-wool facilitates the operation. The completely developed picture consists of insoluble glue with a coating of resin, and by gently heating (to the melting point of resin) they are united to form a skeleton with protective capacity.

As far as the writer knows, the use of these stained solutions of resin was first published by E. Vallot.* He used a solution of asphalt and methyl violet in ether.

The process, however, is considerably older, and was formerly used by the writer in an unpublished process (albumen-bitumen), and likewise in connexion with the ordinary chromated albumen printing process on zinc. It is not easy to adjust the proportions of the solution, but the following formula gave excellent results:—

Methyl violet	3 grammes.
Syrian asphalt	10 ,,
Chloroform, dissolve in	200 c. c.

to this is gradually added benzole, 400 c. c., perfectly free from water (the water to be removed, if necessary, with calcium chloride).

Let the solution stand for forty-eight hours, filter, and replace the evaporated chloroform with about 25 c. c. more. By following the instructions exactly a solution is obtained that flows admirably, does not produce lines, and dries at once with a brilliant homogeneous surface.

If we summarise the variations in these processes, we have:—

1. *Alteration of the Zinc surface by primary Etching.*—The plate is roughed, to make the film adhere more firmly.

2. *Hardening of the Enamel Film by incorporating Resinous Substances.*—These are either added to the solution or applied as a film after printing. In both cases the hardening is effected by gentle heat (melting point of resin).

3. *Hardening the Film of Glue by Tanning.*—The use of chrome alum, tannin, formalin, alcohol, &c., sometimes present in the coating solution, and sometimes in the acid. Variations of this kind have been thoroughly tested in great number by the writer, and they are not sufficient of themselves, but render other modifications of the process indispensable.

4. *The use of Substances more easily changed to Enamel.*—Kinds of seaweed and aquatic plants, with which it is possible to enamel at a lower temperature.

5. *Modifications of the Etching Process.*—The use of etching fluids that do not too strongly attack the slightly enamelled glue;† and methods of etching that will smoothly etch altered, crystalline zinc (in high-temperature enamelling). Concerning this last method, see following full instructions.

In the years 1895 and 1896 additional further studies were made in relation to the zinc-enamel process.

The writer has already pointed out that the chief advantage of the enamel process—richness of half-tone—depends upon the spreading of the etching‡ (similar to Klic photogravure) and the use of copper, as an excellent metal for etching purposes. Further studies have shown, however, that the same advantages are equally attainable with zinc. These studies led to the following results, which are all based upon a modification of the etching process.

A print upon zinc is burnt in till it attains an intense brown colour, and is then treated with a weak solution of chromic acid, which has an oxidising and slightly solvent action upon the zinc.

The basic, aqueous zinc salt, formed secondarily in the small hollows, by its insolubility gives the process a specific character. If the plate is taken out of the chromic acid bath, it appears to be scarcely etched. If it is now immersed in a nitric acid etching bath, the depth of the etching becomes immediately visible, owing to the solubility of the zinc salt. In case of need, this process may be repeated several times, but with practice it can usually be done at one etching.

To form a clear conception of the nature of the process, imagine, in place of the zinc, a crystalline cake of salt soluble in water, upon the

* Eder's *Jahrbuch für Photographie*, 1894, p. 490 (BRITISH JOURNAL OF PHOTOGRAPHY, December, 1893, No. 1754).
† *Ate ier des Photographen*, 1894, p. 702.
‡ *Photographische Notizen*, 1894, p. 164.
§ *Photographisches Archiv*, 1894, p. 374.
‖ *Inland Printer*, 1894 (July number).
¶ *Anthony's Photographic Bulletin*, 1895, p. 106.
** BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1895, p. 716.
†† *Photographische Correspondenz*, 1895, p. 388.
‡‡ *Photographische Correspondenz*, 1895, p. 224.
§§ The same process is described in *Anthony's Photographic Bulletin*, 1895, p. 336.
‖‖ *Photographische Correspondenz*, 1895, p. 387.

* "A New heliogravure process by means of albumen and bitumen."—*American Annual of Photography*, 1893, p. 40.
† Husnik recommended the use of bromine for this purpose.
‡ V. Turati: "Das Durchätzen bei dem Emailverfahren" (*Photographische Correspondenz*, 1896, p. 377).

smoothly polished surface of which water is allowed to act. The water dissolves first the smallest of the crystals, and, penetrating the interstices between the larger crystals, the surfaces of which it merely dissolves and washes, forms an irregular, rough, crystalline cavity. If the water is retarded in its action by the addition of slimy substances (gum, dextrine, &c.), and is likewise turbid (forming a precipitate during the solvent process), the fine crevices will be filled up, and the solvent action will proceed gently within limits, and the points of the crystals will have time to dissolve before the crevices open too far. The formation of the hollow will be rounder and smoother, and very different from that obtained by using water only.

After a clear idea had been thus formed of the causes of the so-called "rough etching," it was possible to think out a modification of the ordinary process of etching with nitric acid, that is to say, a means had to be found of converting the process to a slimy, precipitating one. Slime may be easily produced by adding gum, &c., to the etching fluid; a precipitate may be obtained by various means, as well by chemical as by mechanical processes. The addition of various substances to the bath will produce a fine sediment during the etching, and the valleys of the crystalline mass may be filled up, whilst the summits of the zinc crystals are being dissolved. In this way the etching proceeds smoothly and regularly to its full depth.

This action may be easily demonstrated if smoothly polished zinc is heated to nearly melting point, allowed to cool, and then submitted to treatment with various acids.

By the use of a weak solution of chromic acid the zinc is etched, and at the same time the surface is covered with a precipitate of yellowish brown, basic zinc chromate. If this is wiped away, the etched ground is quite smooth.

With ordinary nitric acid a rough, coarse ground is etched; and, on the other hand, a beautiful, even ground, if the above-mentioned slimy, precipitating nitric acid is used instead.*

COUNT VITTORIO TURATI, *Milan.*

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

GREAT YARMOUTH MEETING, JULY 12–17.

Synopsis of proceedings:—

MONDAY, JULY 12.

Excursions:—To be devoted to visiting places of interest in Great Yarmouth and vicinity, under qualified leadership.

Proceedings:—Opening of the Convention. Reception by his Worship the Mayor of Great Yarmouth (Colonel H. E. Buxton), in the Town Hall, and installation of the President, F. P. Cembrano, Esq., who will deliver the Presidential Address, 7.30 p.m. Conversazione and Lantern Exhibition, 9 p.m.

TUESDAY, JULY 13.

Excursions: No. 1.—Norwich; leaving Stone Cutters' Quay, Yarmouth, by special steamer (by Breydon Water and River Yare), 9.30 a.m.; or by train from Vauxhall Station, 9.5 a.m; returning from Thorpe Station, 5.20 p.m.

No. 2.—Lowestoft; by steamer, *viâ* the sea, to Lowestoft Harbour, leaving South Quay, 10 a.m.; by break and road, leaving headquarters, 9.30 a.m.; By train (Southtown Station), 10.25 a.m. Boat leaves Lowestoft 5 p.m.; break, 5 p.m.; train, 5.40 p.m.

Proceedings:—Papers in Town Hall, Great Yarmouth—A. Horsley Hinton, Esq., on *Methods of Control and their influence on the Ultimate Development of Artistic Photography;* Frank Bishop, Esq., on *Photographic Copyright,* 8 p.m. Optical Lantern, 9.30 p.m.

WEDNESDAY, JULY 14.

Proceedings:—Annual General Meeting, 10 a.m. Election of Council for ensuing year, 11 a.m. The Convention Group, about 12 noon.

Excursion:—Caister Castle, Gorleston, the Harbour's Mouth, and Old Pier; by break, 3 p.m.

Annual Dinner (to be followed by Smoking Concert), 7 p.m.

THURSDAY, JULY 15.

Excursions: No. 1.—Up the River Bure to Wroxham; leaving Stone Cutters' Quay by special steamer, 9.30 a.m.; lunch on shore, near Salhouse Broad, 2 p.m.; return from Wroxham by train, 5.37 p.m.

No. 2.—Blickling Hall; leave the Beach Station, Yarmouth, 9.10 a.m.; return from Aylsham by train, 4.50 p.m.

Proceedings:—Papers in Town Hall, Great Yarmouth—T. R. Dallmeyer, Esq., on *The Points of a Lens;* A. Haddon and F. B. Grundy on *The Strength of Hypo Solution and time of Immersion for fixing Albumen Paper; Photographic Research (Convention Grant Paper),* 8.30 p.m. Optical lantern, 9.30 p.m.

FRIDAY, JULY 16.

Excursions:—No. 1. Oulton Broad and Beccles, by special river steamer from Stone Cutters' Quay, 9.30 a.m.; by brake from headquarters, 9.30 a.m.; by train from Southtown Station, 10.25 a.m.; arriving back in Yarmouth about 6.30 p.m.

No. 2. Swaffham for Castle Acre, by train from Vauxhall Station, 9.15 a.m.; lunch at Castle Acre, 1.0 p.m.; return from Swaffham Station, 3.43 p.m.

Proceedings:—Papers in Town Hall, Great Yarmouth—William Gamble, Esq., on *The Half-tone Process Popularly Explained* (illustrated by lantern slides); E. J. Wall, Esq., *A Talk on Photography in Natural Colours,* 8.0 p.m. Optical lantern, 9.30 p.m.

SATURDAY, JULY 17.

Excursions:—Ipswich, by trains from Southtown Station, leaving at 8.15 a.m. and at 10.50 a.m., returning by train from Ipswich 5.10 p.m., arriving at Yarmouth 6.57 p.m.

Holders of fortnightly tickets from London may break their journey at Ipswich if they return to town on Saturday, July 17.

NEW PHOTOGRAPHS OF PSYCHIC RADIATIONS.

OUR contemporary, *Light,* states that Commandant Darget, of Vouziers, has been experimenting in this direction for some time. The *Revue Scientifique du Spiritisme* of M. Delanne, 5, Rue Manuel, Paris, reproduced two of these photographs, in which it is claimed that a somewhat shadowy image of a bottle had been mentally projected on to a plate. Commandant Darget states that he projected some images on to plates held close to his forehead, in the dark room of a photographer at Tours, where he had been invited to experiment among strangers. He has produced impressions in several ways: by touching the gelatinised surface of the plate in the developing bath with his fingers; by touching the glass side in similar conditions; by touching the liquid of the bath only, and not the plate; by magnetic passes made over the plate while in the bath, without contact. He has thus obtained over one-hundred-and-fifty images of radiation.

Everybody does not possess the necessary luminous effluvia, says the Commandant, as similarly everybody cannot mesmerise. Some people only radiate under strong emotions. Joy, sadness, anger, radiate different designs. "The radiations from the brain of a Napoleon during a battle would impress a very different form from that of a St. Vincent de Paul planning a new hospital, or from that of a criminal immediately before his execution." The halo of saints is not a myth, says the Commandant; the brain throws out rays which penetrate through the skull, even as the X rays do, and photography registers these rays.

One of the photographs produced by the Commandant, by holding his fingers in contact with the gelatinised surface of a plate, while in the bath, is reproduced by our contemporary. Dark spots show the points where the fingers were in contact with the plate. These are surrounded by fluffy-looking processes, produced by the radiation from the fingers, and from these further striations project. The medium, Madame Agulano, who gave the clairvoyant descriptions of the Choisy-Yvrac astral operator, was present when this impression was produced, and stated that she assisted in its production by projecting a current of her radiation through the Commandant's arm. The Commandant considers that this is probable, as the image is more pronounced in character than any he has obtained while alone. The impressions produced resemble those obtained by Dr. Luys, who affirms that they are not the result of the heat of the fingers. He verified that by trying the effect of test tubes filled with hot water, held in contact with the plates.

On another photograph, obtained by Commandant Darget by placing his fingers on the *glass side* of the plate while in the bath, in the presence of Madame Agulano, the lines produced by the radiations from the fingers of the two hands assume almost the same form as that of the "field" of a magnet, as shown in the popular experiment of holding a magnet under a sheet of glass on which iron filings have been spread. The filings then arrange themselves in a form which is said to illustrate the "lines of force" of the magnet. This image, consequently, demonstrates the polarity inherent in psychic radiation.

Dr. M. Adam, of Paris, has also made a series of experiments at the instigation of Dr. Baraduc and on the latter's method, either while under emotion or when concentrating his mind on a given idea. While Dr. Baraduc maintains that the several principles of man, as taught in esoteric schools, impress images differing in character, Dr. Adam does not consider his own experience sufficient to enable him to contravene or confirm that theory. He found that the image oftenest appearing on the plates was of a spiral character. He is unable to say whether it represents attracted interiorising cosmic ether, or exteriorising psychic radiation. These images were produced by holding the fingers above the plates without contact.

Basing himself on Saint-Martin's statement, that the life of the organism is contained in the blood, Dr. Adam made a series of experi-

* A process based upon this has worked admirably in the etching establishment of the author. F. Hemsath, of Frankfort-on-Main, has an agency.

ments with the blood of recently killed fowls, ducks, rabbits, &c. The plates were placed over saucers containing the blood, the glass side turned towards the blood, and left thus exposed in the dark room for fifteen minutes. The images thus obtained were identical, in many cases, with those obtained by holding the fingers over the plates without contact. Both gave similar spirals, or whirls, or vortices, from which it is evident that our blood emits similar radiations to the so-called psychic or neuric effluvia radiated from the fingers. In these experiments he found that the blood gave stronger imprints after an hour or so than when still warm; also the blood extracted from the bodies impressed stronger images than those obtained from the severed necks of the headless bodies.

Dr. Adam also found that some portraits taken by him in the ordinary way showed similar striations to those obtained by holding the fingers above the plates, from which it would appear that plates may be unconsciously impressed by the operator's vital radiation while manipulating them in the usual photographic process.

These reproductions of human radiation are of value as demonstrating by mechanical evidence the existence of these effluvia, which constitute the "nexus," or connecting link, between the physical and psychical worlds. These effluvia not only constitute the basis of mesmeric and hypnotic action, they are also the basis of the sense relations accompanying "suggestions;" they are the basis of all magical action and sorcery; of telepathy, or thought transference to a distance and traversing solids; they are the connecting link in mediumistic subjective action, and constitute the "pabulum" used in the production of exteriorised objective phenomena and materialisations, as was shown by the Choisy-Yvrac clairvoyant's description; they constitute the exteriorised sensibility of Dr. Luys, De Rochas, Professor Boirac, and Dr. Bremaux, and from which the human double has been shown to be concentrated, thus illustrating the process of the production of so-called "spirit forms," projected through mediums. These radiations have been shown to carry polar energy, and constitute the force by which objects are moved without contact by action exerted through mediums, even as human bodies and limbs have been levitated and attracted by mesmerisers, by the use of the same energy. They constitute the luminous aura described by Reichenbach's, De Rochas', and Dr. Luys' sensitives, and the fact of their luminosity is now demonstrated photographically.

THE DANSAC-CHASSAGNE COLOUR PROCESS IN THE UNITED STATES.

Mr. W. E. Woodbury, editor of the *Photographic Times* (New York), sends us the following notes on this process:—

The pictures exhibited in this country are certainly very disappointing. They resemble pictures that have been tinted by hand, only that an artist of fair ability would turn out considerably better results for a very small remuneration. A careful examination of them, however, causes one to doubt that they are produced in the manner described. Two pictures which had been made from the same negative—and which should, of course, be identical—were not so. To an ordinary observer the colour appeared the same, but on a close examination we found a most peculiar effect. The picture was that of a lady posed by the side of an ornamental table. Round the edge of this table was a border of tapestry, with alternate green and red squares. In both pictures these were coloured green and red, but a careful comparison revealed the fact that *the squares that were red in one image were green in the other.* If the process is a chemical one this extraordinary effect is certainly mystifying. Another fact which causes us to doubt the chemical action theory is that in many places the colouring matter *is spread beyond the image itself*, as in the case of one picture with a branch of overhanging leaves there are leaves in colour *which are not in the photograph itself.* Examining another picture, we find the same table already referred to. It is highly coloured in the other two pictures, but in the third it occupies an unimportant part in the image, and has *no colour at all.* Is it possible that this extraordinary process *only colours the important parts of the picture?* Another curious fact is that the whites of the picture are perfect and show no traces of colour. Scientists tell us that white is composed of the three elementary colours. Theoretically, then, the whites of the image should absorb each of three dyes in such proportions as to produce white, but this effect does not appear to take place.

Another remarkable fact is that in some places where the negative has afterward been retouched by hand the selective absorption in these parts *is just the same.*

PHOTOGRAPHING AT GREENWICH OBSERVATORY.

The following extracts from the Annual Report of the Astronomer Royal relate more particularly to the photographic part of the work:—

The Thompson Equatorial, presented by Sir Henry Thompson, forms a handsome addition to the Observatory, and it has been mounted in the Physical Observatory under the Lassell Dome. Its erection there was commenced early in November, but it was not ready for use till April, and there are still certain accessories which have to be supplied. The adjustment of the polar axis and of the 26-inch object-glass were at once taken in hand, and the former was soon satisfactorily effected. For the adjustment of the object-glass, a number of photographs have been taken inside and outside of the focus, the separation between the lenses being varied with a view to the correction of the small outstanding aberration and coma. Some photographs of the moon and of double stars have been taken, an enlarging camera with a Dallmeyer concave magnifier being applied to the telescope in some cases to give a magnified image. This equatorial carries not only the 26-inch photographic telescope with the $12\frac{3}{4}$-inch Merz guiding telescope and the Thompson 9-inch photo-heliograph, but also a Cassegrain reflecting telescope of 30 inches' aperture, with the 6-inch Hodgson telescope as guider in place of the counterpoise at the other end of the declination axis. It thus provides a very powerful combination of telescopes specially adapted to photographic work of various kinds, and special arrangements in the instrument and observing room have been necessary to meet the varied requirements. The instrument has now been got into good working order, and is very satisfactory as regards the mechanical arrangements. The photographic spectroscope will be used in connexion with the Cassegrain reflector, mounted firmly at the back of the cell of the mirror, a diagonal prism being used to reflect the rays into the collimator.

The 28-inch Refractor was in constant use for micrometric measurements from 1896, May 11, to 1897, January 11. On January 12 the crown lens was reversed, and the instrument used for photography till April 23, except on the occasion of Professor Barnard's visit to the Observatory, when the lens was replaced in the visual position. Besides several micrometric observations, 195 double stars were measured during the year ending May 10. The distance and position angle of the satellite of Neptune were measured on four nights, and the equatorial and polar diameters on two nights. The equatorial and polar diameters of Mars were measured on seven nights. With the crown lens in the reversed position, a number of photographs were taken in and out of focus for the better adjustment of the separation of the lenses and the tilt.

The following statement shows the progress made with the photo-mapping of the heavens:—

	For the Chart (exposure 40 m.).	For the Catalogue (exposure 6 m. 3m., and 20 s.).
Number of photographs taken...	175	139
,, successful plates.....	135	110
,, fields photographed successfully	133	98
Total number of successful fields reported, 1896, May 10	490	732
Number of photographs, previously considered successful, rejected during year	72	16
Total number of successful fields obtained to 1897, May 10	551	814
Number still to be taken	598	335

Of the fields still required, 197 are within 10° of the Pole, and no photographs of this part of the sky have yet been taken, the work being purposely deferred till near the epoch 1900.

Photographs of the sun were taken on 222 days, and of these 471 have been selected for preservation, besides twelve photographs with double images of the sun for determination of zero of position angle.

For the preceding year Greenwich photographs were selected for measurement on 206 days, and photographs from the Solar Physics Committee (filling up the gaps in the series) on 154 days, making a total of 360 days out of 366 on which photographs are available.

The spot activity of the sun has continued, on the whole, to decline since the date of the last report, but has undergone two remarkable cases of temporary revival; the one in September, 1896, when the longest connected group ever photographed at Greenwich was observed, and the other at the commencement of the present year. On the other hand, the sun was seen to be free from spots on the six days in the year ending 1897, May 10.

PHOTOGRAPHS IN RELIEF.

Mr. G. G. Rockwood, the well-known photographer of Broadway, New York, writes us as follows: "I send you a report of an interview which was published in the *New York Herald* on May 30. The one point which I feared I did not make clear was, that a shaded drawing can be put into a graduated relief, or, in other words, a portrait or drawing of any kind can be reproduced in *bas-relief* by photography alone."

"After long years of experiment, a photo-modelling process has been perfected, and the first medallion produced by it is a nearly front face of Abraham Lincoln, which is now in the possession of Mr. George G. Rockwood, of No. 1,440 Broadway, who has been an experimenter in the art, and adviser of Mr. John Baynes, of Stamford, Conn., to whom is due the credit of bringing the process to a mechanical and artistic perfection.

"The work done by Mr. Baynes proves that it is practical to produce a portrait in a proportionately graded bas-relief, in a solid, by means of light, and the inventor is not aware that there is any limit to the height of the relief which can be obtained.

"The practicability of this new process means a revolution in numismatics and in kindred arts, such as stamping plates for book-cover decorations, embossing dies for stationery and other uses, and pattern rollers for ornamentation of base and precious metals, and for silk and cotton fabrics.

"'This first medallion of the new process,' said Mr. Baynes, when questioned about his discovery, 'proves that light can be used in the production of actual forms in works of art. Nor is the presence of the desired object necessary. This portrait of Lincoln was taken from Marshall's painting, and its border from a drawing. It is really a portrait, recognised as containing every detail of the well-known face of the martyred President. In the most carefully executed medals by the old process there cannot be found the refinement of expression and the precision and certainty here manifested. It exhibits a subtlety of movement of surface unequalled by the product of any tool heretofore used. The modelling possibilities of this old tool, light, now first successfully applied for that purpose, are limited only by the inventive and imaginative faculties of the artist.'

"*The Course of Experiments.*—For nearly forty years experiments have been conducted to find the process that has now been discovered, and, though often the desired result appeared to be within reach, it has until now eluded the most persistent search.

"'The first experiments that I know of in this direction,' said Mr. Rockwood, as he was exhibiting to me the medallion of Lincoln, 'were made in Paris early in the sixties. The artist placed the clay to be worked on under a lighted dome, and surrounded it with a battery of fifty cameras, which projected on it as many images, taken from all sides of the object to be reproduced. Then, by means of pantographs, a figure was produced and smoothed up to the lines made by the cameras.

"'I started my experiments somewhat on the same lines. I made a photograph of the desired profile, properly lighted, and then with a magic lantern projected the image on a sheet of clay, so the lines could be followed by a sculptor. These experiments, which were made in 1880, were quite successful, and then I began work for the purpose of getting the relief by mechanical agencies alone; but I was too busy in other directions to give the needed time to it. I was rejoiced to learn that Mr. Baynes was working in the same direction. Since then the desired result has been attained. Both the commercial and the artistic side of the process have been established, and it can be used for designs in relief for all decorative purposes. Panels as large as three by four feet, with as much relief as may be desirable, can be obtained. Then the designs can be worked in any metals by processes now used after the die is made.

"'When working with the human figure, we have to guard against the striking effects that would be produced by the very deep impression that the hair would make in contrast with the flesh, and this is done by "making up" the entire head, after the fashion of clowns, that is, whitewashing it. Then we get the exact results of the light, without the exaggerations that would come from dark portions joining those nearly white.

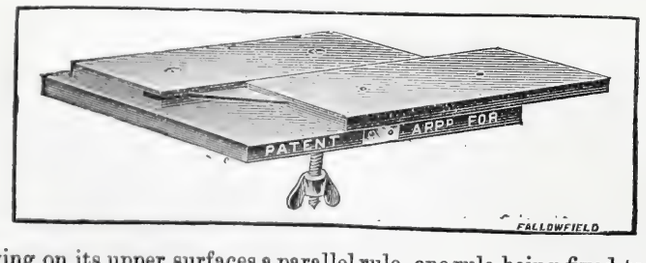
"'The use of gelatine in photographic mechanical processes is nothing new, but the obtaining of this high relief, which is possible to half an inch, is, and its discovery will mark the beginning of a revolution in the art of relief decoration.'"

Our Editorial Table.

A Stereoscopic Adapter.

Jonathan Fallowfield, 146, Charing Cross-road, W.C.

From Mr. Fallowfield we have received a useful piece of apparatus, designed in accordance with the principle first suggested by the late Mr. Latimer Clark, for taking binocular photographs with a quarter-plate camera and one lens. It consists of an extra tripod table,



having on its upper surfaces a parallel rule, one rule being fixed to the table and the other to the bottom of the camera employed. Thus exposures are made in two different positions—one with the camera to the right, and the other with the camera moved across to the left side. The adapter is secured to the ordinary tripod top by means of the fly nut shown in the cut, and the camera is screwed on to the movable front by means of the holes shown. By the movement of the camera from side to side, two successive photographs at the theoretical distance of separation may be taken of the one view or object, and properly mounted prints from the negatives will give a true stereoscopic effect.

Platinotype Printing.

By A. Horsley Hinton. 90 pp. Price 1s. London: Hazell, Watson, & Viney, 1, Creed-lane, E.C.

Mr. Hinton's book fills a gap. The two previously published books devoted to this fascinating printing process—viz., Pizzighelli & Hübl's masterly little treatise, and Abney & Clark's somewhat more exhaustive volume—are decidedly "over the heads" of the beginner, for whom alone Mr. Hinton has undertaken to cater. The result is a concisely treated description of platinum printing by both the hot and cold processes, sepia paper and C.C. paper also coming in for special reference. Toning, Packham's catechu process, local development, and many other points in connexion with the subject are also dealt with. We have no doubt that this useful little book will prove of great practical assistance to beginners in platinum printing.

The Photographers' Note-book and Constant Companion.

By Rev. F. C. Lambert, M.A. 94 pp. Price 1s. London: Hazell, Watson, & Viney, 1, Creed-lane, E.C.

Mr. Lambert is an industrious and systematic note-taker, and the scope of the 250 practical hints, formulæ, expedients, &c., which form his little book, is extremely wide. The subjects treated of range—we quote at random—from art to astigmatism; but the selection has been judiciously made, and the result is a helpful compilation, to which one can refer in the certainty of getting sound and accurate information clearly set forth.

Dr. P. H. Emerson's last published book, *Caôba: a Real Romance of the Cuban Rebellion* (published by Mr. Nutt, 270–271, Strand, W.C.), has just been issued in a cheap edition, price 3*s.* 6*d.* The book was well received by the press on its first appearance three months ago, and its reissue in cheaper form is a further proof of its popularity. We believe that Dr. Emerson's writings will, in future, be exclusively non-photographic in character.

News and Notes.

Messrs. G. Houghton & Son, of 89, High-holborn, W.C., announce considerable reductions in the prices of their fluorescent screens for X-ray work.

Messrs. Gunn & Stuart, of Richmond, have taken, by special command, a portrait of the Queen, who is seated in front of her Indian attendants, Gholam Mustafa and Sheikh Chidda.

Professor Karl Remigius Fresenius died at Wiesbaden on Thursday, June 10, from an apoplectic attack. The deceased, who was seventy-nine years of age, was well known in scientific circles for his work in chemical research.

Mr. J. Craig Annan, Glasgow, and Mr. William Crooke, Edinburgh, have kindly consented to act as Judges at the Blairgowrie and District Photographic Association's second Exhibition in January. Mr. T. C. Gorrie (Secretary) and Mr. John B. Maclachlan (Vice-President of the Association) have been appointed Joint Secretaries of the Exhibition.

Photography and Cricket.—Prince Ranjitsinhji's volume, having regard to the time of publication, is to be called the *Jubilee Book of Cricket.* A great feature of it will be the illustrations, for which about 100 special photographs have been taken. These present all our leading cricketers in the active pursuit of the game, some batting, others wicket-keeping.

A deed of assignment for the benefit of creditors has been executed by Charles Cheetham Vevers, manufacturer of and dealer in photographic apparatus, 163, Briggate, Leeds, and 3, Airedale-mount, Rodley, near Leeds, under which Mr. Albert Nicholson, accountant, Upper Fountain-street, Leeds, is trustee. The unsecured liabilities are returned at 1190*l.*, and the assets, after deducting the claims of preferential creditors payable in full, are estimated at 1228*l.* The following is a list of the principal creditors interested hereunder:—Thompson, G. W., Birmingham, 14*l.*; Cheetham, W. H., Guiseley, Leeds, 225*l.*; Sagar & Co., Halifax, 17*l.*; Demaria Frères, Paris, 43*l.*; Vevers, C., Rodley, 69*l.* The Leeds creditors are:—Hudson & Co., 32*l.*; Illingworth, Ingham, & Co., 20*l.*; Rusby, William, 12*l.*; and Tempest, E., 16*l.* The London creditors are:—The Eastman Photographic Company, 20*l.*; Gem Dry Plate Company, 14*l.*; Lowther, D. R., 11*l.*; Bethell, T. P., 11*l.*; Société des Lunetiers, 16*l.*; Stone & Co., 14*l.*; Theobald, J., & Co., 41*l.*; Greenwood & Co., 10*l.*; Adams, R. T., & Co., 11*l.*; and Braulik, G., 13*l.*

THOSE who are interested in popular art should not miss Messrs. Cassell & Co.'s Black and White Exhibition, now open at the Cutlers' Hall, Warwick-lane. The works exhibited are by such eminent artists as Mr. J. MacWhirter, R.A., Mr. W. L. Wyllie, A.R.A., Mr. H. Railton, Mr. W. Hatherell, R.I., Mr. R. Caton Woodville, Mr. Lucien Davis, R.I., Mr. H. M. Paget, Mr. Davidson Knowles, Mr. G. Sheridan Knowles, R.I., Mr. T. W. Wilson, R.I., Sir J. D. Linton, Mr. J. R. Weguelin, Mr. Gordon Browne, and Mr. Stanley L. Wood.

ROYAL JUBILEE PROCESSION PROGRAMME.—An illustrated programme of the above, authorised by H.R.H. the Prince of Wales, will be published in aid of His Royal Highness's Hospital Fund for London, to which the entire profits will be devoted. The programme will contain detailed particulars of the procession, and sixty-four pages of illustrations will run throughout the pamphlet, with descriptive letterpress underneath. It will be published at one shilling, and will be on sale four or five days before the day fixed for the procession, and will form, not only an illustrated guide, but an interesting memento of the day.

DEATH OF MR. ALVAN CLARK.—Mr. Alvan Clark, the famous manufacturer of telescopic lenses, died on Wednesday, June 9, of apoplexy. Astronomers owe much to Alvan Graham Clark. In a modern telescope the most important feature is the great object-glass, and the grinding of such a refractor as the wonderful 36-inch glass in the Lick telescope is an operation of the utmost delicacy and difficulty, requiring not only the finest mechanical skill but also scientific knowledge of the highest order. Alvan Clark was born at Fall River, Massachusetts, in 1832, and after leaving school entered the firm of Alvan Clark & Sons, which had been established by his father, who died in 1887. Among the more famous lenses, besides that of the Lick Observatory, in California, which, until the completion of the Yerkes lens, held the record among object-glasses, he made the 30-inch lens for the Russian Imperial Observatory at St. Petersburg, the 26-inch refractor in the Naval Observatory in Washington, and many other famous telescopes. Nor was Alvan Clark a mere maker of instruments; he was an astronomer of high erudition, and made many independent discoveries, including the companion star to Sirius, for which the French Academy of Sciences awarded him the Lalande gold medal in 1862.

THE NEW TELEGRAPHY.—In the course of his recent lecture at the Royal Institution, Mr. W. H. Preece, Electrician to the Post Office, pointed out that all forms of energy are transmitted in definite waves with known velocities, and one of the most magnificent generalisations of the present era is by Clark-Maxwell, that all these disturbances are of precisely the same kind, and only differ in degree. The waves are reflected, refracted, and polarised. Electric waves, however, differ from light waves in this, that we have also to regard the direction at right angles to the line of propagation of the wave. When electricity is stored in a potential state in the molecules of a dielectric like air, the molecules are strained. It is called a charge, and it establishes in its neighbourhood an electric field. When active, it is called a current. The surrounding neighbourhood is then found in a state of stress, forming a magnetic field. In the first case the charges can be made to rise and fall, and to surge to and fro with rhythmic regularity, exciting electric waves along each line of electric force; and in the second case the currents can rise or alternate in direction with the same regularity, and originate electro-magnetic waves, whose fronts are propagated in the same direction. The former is the method of Dr. Hertz, which has been recently turned to practical account by Sig. Marconi, and the latter is the method put into actual practice by Mr. Preece in 1892, when distinct messages were sent across the Bristol Channel, a distance of three and a third miles. Again, in 1895, the Postal cable broke between Oban and the Isle of Mull, and, as there were no means of repair available, communication for signalling was established by transmitting the signals across the blank space by these electro-magnetic waves. In the electro-magnetic system two parallel circuits are established, one on each side of a channel or bank of a river, each circuit becoming successively the primary and secondary of an induction system, according to the direction in which the signals are being sent. Strong alternating or vibrating currents of electricity are transmitted in the first circuit so as to form signals, letters, and words in Morse characters. The effects of the rise and fall of these currents are transmitted as electro-magnetic waves through the intervening space, and, if the secondary circuit is so situated as to be washed by these ethereal waves, their energy is transformed into secondary currents in the second circuit, which can be made to effect a telephone, and thus to reproduce the signals. Their intensity is much reduced, but still their presence has been detected though five miles of clear space have separated the two circuits. Such effects have been known scientifically in the laboratory since the days of Faraday and Henry, but it is only by the introduction of the telephone that it has been possible to utilise them. Last year an effort was made to establish communication with the North Sand-head lightship on the Goodwin. The screening effect, however, of the sea water, and the absorption by the iron hull of the energy of the induced currents, left the effect too minute for signalling. In July last year Sig. Marconi brought to England a new plan, which is based on utilising electro-magnetic waves of very low frequency. It depends essentially on the rise and fall of currents in the primary wire. He utilises electric or Hertzian waves of very high frequency, and they depend upon the rise and fall of electric force in a sphere or spheres. He has invented a new relay, which, for sensitiveness and delicacy, exceeds all known electrical apparatus. The peculiarity of his system is that, apart from the ordinary connecting wires of the apparatus, conductors of very moderate length only are needed, and even these can be dispensed with if reflectors are used. His transmitter is Professor Righi's form of Hertz radiator. Two spheres of solid brass are fixed in an oil-tight case of insulating material, so that one hemisphere of each is exposed, the other being immersed in a bath of vaseline. This oil has the advantage of keeping the spheres clean, and it impresses upon the waves excited a constant form. Sig. Marconi generally uses waves of 120 centimetres. Two small spheres are fixed close to the large spheres, and connected each to one end of the secondary circuit of the induction coil, the primary circuit of which is thrown in and out by a Morse key. Whenever that is depressed sparks pass, and, since the system contains capacity and electrical inertia, oscillations are set up of extreme rapidity, the frequency being possibly 250 millions per second. The distance at which effects are produced depends chiefly on the energy in the discharge. A six-inch spark coil has sufficed for four miles, but for greater distances a more powerful coil, emitting twenty-inch sparks, has been employed. The relay consists of a glass tube, four centimetres long, into which two silver pole pieces are tightly fixed, separated by about half a millimetre. This thin space is filled up by fine nickel and silver filings, and the tube, exhausted to a vacuum, is sealed. It forms part of a local circuit containing a local cell and a sensitive telegraph relay. In its normal condition, the metallic powder is virtually an insulator, the particles lightly touching each other; but, when electric waves fall upon them, they are polarised, order is installed, and they cohere; electrical contact ensues, and a current passes. Oscillations set up in the transmitter fall upon the receiver, tuned in sympathy with it, coherence follows, currents are excited, and the signals made. In open, clear spaces, within sight of each other, nothing more is wanted, but, when obstacles intervene and great distances are in question, height is needed, and tall masts, kites, and balloons have been used. Excellent signals have been transmitted across the Bristol Channel through a distance of nine miles. Mirrors also assist and intensify the effects. It is curious that hills and apparent obstructions fail to obstruct. Weather seems to have no influence; rain, fog, snow, or wind, avails nothing.

Patent News.

THE following applications for Patents were made between June 2 and June 9, 1897:—

LENSES.—No. 13,415. "Improvements in Magnifying Glasses or Lenses." Complete specification. A. WAGNER, H. S. WILLIAMS, N. H. BROWN, and M. EARLE.

ANIMATED PHOTOGRAPHY.—No. 13,421. "Improvements in Apparatus for Taking, Viewing, or Projecting Photographs of Moving Objects." B. ACRES.

CLIP FOR PHOTOGRAPHS.—No. 13,445. "An Improved Clip for Photographs and suchlike Articles." W. R. FAIREY.

FINDER-SHADE.—No. 13,603. "An Improved Finder-shade for Cameras." E. G. PLATT.

LENSES.—No. 13,769. "Improvements in Means and Appliances for the Use of Reading Lenses, Magnifying Lenses, and the like." N. DAVIDSON.

ANIMATED PHOTOGRAPHY.—No. 13,866. "Improved Means or Method of Producing, Projecting, and Exhibiting Animated Photographs and Apparatus therefor." J. F. SIMPSON.

HAND CAMERAS.—No. 13,883. "Improvements in or connected with Hand Cameras." J. NOBLE.

LENS.—No. 13,904. "Improved Photographic Objective." Complete specification. C. P. GOERZ and E. VON HÖEGH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
19	Ashton-under-Lyne	Excursion: Windermere. Leader, Chas. Lord.
21	Southland	Home Portraiture.
21	South London	*Cycling Photography*. W. D. Welford.
22	Ashton-under-Lyne	Exhibition of Lantern Slides.
22	Hackney	Excursion: Malden. Leader, R. Beckett.
22	South London	Excursion: Dorking. Leaders, Messrs. Jarvis and Sayers.
24	London and Provincial	Annual Meeting.
26	Croydon Microscopical	Excursion: Chertsey, and Down the River by Shepperton and Halliford to Walton. Leader, J. G. Lincoln.
26	Darwen	Excursion: Chatburn and Worston. Leader, J. F. Leach.
26	Hackney	Excursion: Buckhurst Hill. Leader, W. Selfe.
26	Polytechnic	Excursion: Kingston, from Richmond. Leader, F. Parker.
26	Wolverhampton	Excursion: Bridgnorth. Leader, T. H. Cox.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 15,—Photo-mechanical Meeting,—Mr. H. Snowden Ward in the chair.

Mr. W. D. RICHMOND, who was unable to be present, forwarded a very exhaustive paper—which was read by the HON. SECRETARY—upon the subject of

PHOTO-LITHOGRAPHY.

The author stated that he proposed to treat the subject in a general manner, without going into the minutiæ involved in formulæ; and he defined a photo-lithographic transfer as a print having a photographic origin, and whose image consists of some kind of fatty or waxy ink, supported upon a surface of albumen, gelatine, gum, starch, or other similar substance. The paper for the transfer should be of a kind which would retain much of its toughness

while wet, of fine and even texture, and preferably wove. The nature of the sensitive coating was fully dealt with, and a method specially suitable for the amateur, and first used by Mr. Richmond some thirty years ago, was described as follows: Prepare a solution of gelatine and potassium bichromate of such a consistency that in the warm state it can be readily applied to the paper by means of a camel's-hair brush; coat a piece of white wove letter paper as evenly as possible; when dry, expose it to light, coated side up, for about a minute, until a little discolouration takes place, and then apply a second coating as before. This method was recommended to those who wish to try gum arabic or albumen, as it makes the application of two coats comparatively easy of accomplishment. Mr. Osborne's process (albumen and gelatine), patented in 1859, was briefly alluded to, and the use of gelatine paper was also dealt with, it being pointed out that, by drying freshly sensitised gelatine paper upon glass, the surface would more readily part with the ink, and better contact with the negative was secured. Cutting and Bradford's process, in which a transparent positive takes the place of a negative, and Toovey's method, with gum, were also described. Much of the success of photo-lithography depended upon the quality of the negative, but it was a mistake to insist upon extreme opacity of the deposit as the chief element, a clear line being of much greater importance, the essential condition of a good negative being the possession of sufficient contrast to enable the ink to be readily cleared away from the print. For making the negative, the wet-collodion process is, in the author's opinion, by far the best when there is much work to be done, but for occasional and some special uses bromide plates are efficient when the copy is fairly good, and non-staining developers, such as ferrous oxalate or hydroquinone, were recommended. A strip of sensitised albumen paper, placed between the leaves of a book with flush covers, and pulled forward a quarter of an inch at a time, formed a satisfactory actinometer. Lithographic printer's ink must be used for inking in the transfer, the best method being to dilute the ink with spirits of turpentine, so as to make it nearly fluid, and to apply it quickly with a letter-press roller in one direction only. The use of the velvet roller was referred to in passing, but Mr. Richmond could not say much in its favour. For transferring to the stone, the transfer should be laid face downwards on a sheet of dry paper, and the back sponged, so that the water can get to the gelatine freely without unduly increasing the relief, and the stone should be thoroughly dry, so that it can take up the damp from the paper without itself becoming wet. The transfer having been laid upon the stone, the whole should be pulled through the press four or more times without further wetting, and the paper ought then to adhere to the stone, and on lifting a corner the ink ought to be found on the stone. If the image appears good and firm, it may be gummed in with a neutral solution of gum arabic and allowed to dry, but, if not, it is capable of improvement by methods detailed in the paper.

Mr. W. E. Debenham referred to a statement by Mr. Richmond to the effect that a good result might be obtained either from a very dense and only moderately clear negative, or from one very clear and moderately dense, and pointed out that there was a third condition, involving the greatest difficulty, where the fine lines were veiled and the other parts clear. It was necessary that there should be equality of veil, if veil existed at all, and this had not yet been achieved with dry plates, and his experience was that, for subjects containing a mixture of coarse and fine lines, the wet-collodion process was greatly to be preferred. The velvet roller was very useful for strengthening a weak place in a transfer, but whether it was worth while to keep a velvet roller in condition for this purpose was another matter.

Mr. T. Bolas regarded the paper as one of the most useful of the communications which had been made at the Photo-mechanical Meetings, particularly because it was not a compilation of details and working formulæ, but rather a study and consideration of the conditions and difficulties of the process.

Mr. W. Gamble said he was a great believer in direct, as opposed to transfer, photo-lithography, which he considered would be the process of the future, and he showed some experimental prints, made by himself by printing from the negative direct on to the stone. The process of printing direct on to zinc or aluminium plates was quite easy, and was practised to a large extent on the Continent. Herr Nister had informed him, also, that aluminium was very successfully used in colour-printing, and that every possible effort was being made to supersede transfer work.

Mr. A. W. Isenthal said it was claimed that aluminium presented a very suitable surface for working upon by hand, and this was one of the reasons why it was being used instead of stone.

Mr. Gamble remarked that aluminium was said to hold the water better than zinc for the damping solution, and to carry the ink better, giving a fuller body of ink in the shadows, and it was also said not to show corrosive spots, which would print white in the result.

Messrs. Warnerke, Dolland, Herbst, and others, also took part in the brief discussion.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 10,—Open Night,—Mr. E. H. Bayston in the chair.

Mr. A. L. Henderson exhibited a camera the front of which he had had furnished with a double set of racks, the additional set being fitted on the outside of the rising front. In using very short-focus lenses, when in the ordinary way the build of many types of camera would interfere by reason of the impossibility of bringing the back sufficiently near the camera front, Mr. Henderson was able to reverse the latter, together with the lens, and so get over the difficulty.

Mr. J. E. Hodd showed an illustration of the possibility of making use of a fixed-focus hand camera for home portraiture. The method consisted in using in combination with the lens a magnifier which gave the required degree of enlargement.

The Chairman had done similar work, using an eighteen-inch lens on a pocket Kodak, which gave nice large heads.

A short discussion took place on the recent comparative tests of the Sanderson swing-front camera and the ordinary swing-back type. The point was raised as to whether a high tower with parallel lines should, in a photograph, present a converging appearance towards the top of the picture.

Mr. Hodd and the Chairman considered the lines should be parallel, although theoretically the convergence was correct.

Amongst the items which required clearing up on certain doubtful points was a print of a group in which two figures clothed in light material had apparently moved in exactly the same direction. It was a question whether the haziness to be seen was due to halation or really to movement, Mr. Henderson and Mr. Beckett suggesting the first, while Mr. Hodd was certain of it.

The Chairman, by whom it was taken, was of opinion, however, that it was caused by vibration in opening the shutter, and that the fact that the fault was only to be seen in the figures mentioned was due to the quicker action of the white dresses on the plate.

Attention was drawn to Lumière's formula for a grainless emulsion, and the question of the alteration or modification of the grain by development caused considerable discussion. It was suggested that the bromide was in groups of varying sizes in the emulsion, and that, according to the nature and characteristics of the developer used, the coarser of these might be developed up and the finer ones fixed out; or, by altering the development and developing up a larger number of the particles, the interstices might be filled up, although no alteration could be said to have been made in the size of the grain.

Mr. Freshwater gave notice of a proposed addition to the rules to cover an application he had received. It provided that the payment of three guineas in a lump sum should constitute one a life member.

PHOTOGRAPHIC CLUB.

June 9,—Mr. E. W. Foxlee in the chair.

Mr. John Nesbit showed examples of enlarged transparencies made from pocket Kodak negatives.

Prospectuses of the Glasgow International Exhibition were distributed.

Gospel Oak Photographic Society.—June 1, the Vice-President in the chair.—Mr. Ramsey, of the Eastman Company attended to give a demonstration of bromide paper developing; but, before doing this, he undertook the task of judging the prints sent for competition from negatives taken at the first outing of the Society this season to Chingford, with the result that Mr. Pridham was awarded the medal offered by the Vice-President. Mr. Ramsey, referring to bromide developing, said that for him to attempt to teach the members anything about bromide paper manipulation was almost as absurd as trying to instruct them in the art of writing, as they knew almost as much of either as he did himself. Still there were always a few hints which might be gathered, and it was to those who had no experience in this branch of photographic printing that this demonstration was specially directed. He said that the old bromide paper, with its semi-glossy surface, had almost entirely disappeared, the demand being for the matt and platino-matt papers exclusively. The lecturer then gave an interesting demonstration of development, first with ferrous oxalate, and some further prints were afterwards developed with metol. Both, in the lecturer's hands, gave charming results, the image given by the iron being considered the best colour. With the iron developer, he said it was very necessary that the prints should be treated with the clearing bath immediately on coming out of the developer; and, with the metol, with a good wash in plain water, otherwise stains would be produced, in the one case from the oxidation of the iron, and in the other from the oxidation of the metol.

North Middlesex Photographic Society.—May 31, Mr. Mummery in the chair.—A member asked whether metabisulphite of potash in the developer acted as an accelerator or a restrainer. Mr. MacIntosh said it acted slightly as a restrainer. Mr. H. W. Bennett said one grain of ammonia 880° would about neutralise four grains of metabisulphite. Mr. MacIntosh referred again to Mr. Golding's query at a previous meeting about using a spectacle lens with isochromatic plates, and said that, to get a sharp image in the negative, you could utilise two methods—one by focussing through a deep blue screen, and removing the latter before taking the photograph, and the other by focussing up sharp without a screen, and taking the photograph through one of a deep orange, that would increase the time of exposure about ten or twelve times. A lantern-slide competition was held, in which Mr. C. Everitt came out first, and Mr. H. A. Lisett second. Slides by the following members were, in addition to the winning slides, added to the Society's collection: Messrs. Stuart, Tyler, Pring, Mummery, and Mattocks. After the slide competition three members of the Committee developed a slide each from negatives brought up by some of the younger workers. This was greatly appreciated, and much interest was taken in the methods adopted, each demonstrator using the method in which he usually worked. In the outing competition (Low-street) Mr. E. R. Mattocks took first place, Messrs. Smith and Golding tying for second.

FORTHCOMING EXHIBITIONS.

1897.	
June 23–30	Paper-makers', Printers', Stationers', Fine-art Publishers', &c., Exhibition, Royal Agricultural Hall, Islington, London, N. Managing Director, W. E. Aylwin, 27, Leadenhall-street, London, E.C.
Sept. 1–Oct. 13	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
December 9–11	Aintree Photographic Society.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE YARMOUTH CONVENTION.

To the EDITORS.

GENTLEMEN,—I have been intrusted by the Convention Council with the arrangement of the lantern-slide exhibitions at the Yarmouth Convention, and am naturally anxious to make them as good as possible, but I am clearly quite dependent on support from fellow Conventioners in the form of the loan of slides. Will you allow me, through your columns, to ask any members of the Convention who will be so kind as to lend slides of (1) places visited during the Leeds Convention, or (2) places visited during other Conventions, to send a list of the slides to me at their earliest convenience, and to arrange that the slides themselves come into my hands at Yarmouth as early as possible on the opening day, July 12.—I am, yours, &c., C. H. BOTHAMLEY.

Weston-super-Mare, June 12, 1897.

A JUBILEE SUGGESTION.

To the EDITORS.

GENTLEMEN,—At the present time, when everybody is preparing to commemorate the sixty years' reign of Her Majesty, it would be well if some of the photographic firms would follow Messrs. Dallmeyer & Co.'s example. One firm of photographers are commemorating the Diamond Jubilee by offering their sitters a framed portrait of Her Majesty at a cheap rate.

It would be interesting to know in what way they intend to commemorate the Queen's Diamond Jubilee among their *employés*. I would suggest, as a fitting mark of that unique occurrence in the world's history, that the firm should grant to every *employé* of twelve months' service, one week's holiday every year, without any stoppage from their wages.

This would be most welcome. The assistants are not only ready, but eager for it, and would jump at the chance of a brief respite, and lift their noses from the ever-revolving grindstone with grateful relief. It would cost the firm next to nothing to grant this great benefit, for the assistants would return with more energy to build up a still larger business. And who can calculate the benefit from such an interlude in the jog-trot existence of the photographic worker? It would relieve the intolerable strain, not only upon the health, but upon the spirits and disposition of all. I should add that, at the present time, this firm of photographers grant no holidays in any form.

Should you kindly give this letter publicity in the JOURNAL, the attention of the heads of the firm in question might be drawn to the above suggestion, and at once act upon it, for is it not the worker who builds up a business? and, in return, he is denied a little change and recreation.—I am, yours, &c., C. F. FOSTER.

London, W., June 12, 1897.

THE SWING BACK.

To the EDITORS.

GENTLEMEN,—Having read the article in your issue of June 4, *re* "Swing Back" in which free reference is made to the illustrations in Messrs. G. Houghton & Son's advertisement for which I am responsible, will, I think, without further apology, entitle me to a few words on the subject.

I regret not being acquainted with Professor Allan's arguments, and can only gather something of their purport by the reference to them in the article above-mentioned; but, whatever these may have been, it should be clear to all that the question of *absolute parallelism versus slight convergence* must ever remain on a par with that of *absolute sharpness versus diffusion of focus*, and must be left to the individual ideas and tastes of the worker.

It should, however, be understood by your readers that the particular subject referred to, viz., Christ College Gateway was taken under special test conditions, and for one purpose only; Professor Allan admits giving this subject up owing to its difficulty, for which very reason I undertook to photograph it, to prove the power at my command when using one of my cameras, and, as will have been observed, I have succeeded in doing what many have given up as hopeless. In this case the only question at stake being that of getting the image on the plate, with the lines parallel (this being the accepted correct thing to do), for any amount of convergence could have been had to order, but an artistic result was not attempted.

In designing my camera, I have endeavoured only to place a greater power in the photographer's hands, and, having done this, it must be left to his judgment how to use it. I am not altogether surprised that some of your correspondents should be inclined to attribute the apparent distortion referred to to the particular camera employed, for I find so many unable to get away from the old order of things; if, however, they would only go to the root of the matter, there would not remain the shadow of a doubt concerning this point.

Now let me try and clear the ground, and prove that the result obtained with my camera is only exactly the same that could have been obtained with a swing-back camera had the latter been provided with a sufficient range of movement between lens and plate.

To make this more clear, may I trouble you to follow me in your imagination while I proceed to photograph the old gateway in question with an ordinary camera. After selecting a lens of suitable focus, I should place my camera in a normal position opposite the subject and examine my ground glass; finding a great excess of foreground, and the top of the building not included, I should proceed to raise the lens, and having reached the limit of this adjustment, and still finding I require more room at the top and less at the bottom (please note up to this point the camera is level and the back vertical), I should proceed to tilt the camera upwards until I succeed in placing the image where I want it on the screen, and in this latter operation have upset the verticality of the back, which must be rectified. Now, have I done this for the express purpose of bringing the virtue of the swing back into play, or simply to raise the lens still higher? Of course, the latter is my sole object, and, could I have raised the lens sufficiently to include what I required, I should not have dreamed of moving the back of the camera out of its normal position, which I know, at starting, *must be vertical* for the proper treatment of the subject in hand, or shall I say, for the benefit of those who prefer a slight convergence, *approximately vertical*.

Now, the proceedings up to this point show clearly that all the operations yet performed have simply resulted in raising the lens high enough for the required purpose, and in keeping the back vertical, and demonstrate most clearly that the swing back would not be used if the lens could be raised sufficiently high without tilting the whole of the camera, unless, as is necessary, when using a lens of poor covering power, which has been raised beyond its capacity, we have to resort to the tilting of the camera? Why? Simply because it pitches the axis of the lens towards the centre of the screen (which must again be readjusted *to the vertical*), and thereby securing better illumination; and it *must* be clearly seen that when adjustments have been used to meet every known requirement, there remains nothing more than a *vertical screen*, and a lens *raised* or *raised and tilted* in a given relation to it. Therefore, it is impossible to lay the distortion referred to either to a swing-back camera or to my own camera with universal front, which, in a more *direct, efficient, and simple way*, provides for *raising, lowering, tilting*, and *focussing* of the lens, while the body of the camera remains *level and undisturbed*; and, if for survey or other purposes it it necessary to photograph a given subject from a given standpoint, and I have succeeded in providing the means for so doing as far as the camera is concerned, you must not hold me responsible for the necessity of using a lens which does not render the subject just as our eyes see it.

Messrs. Bullbeck and Co., the well-known medallists for architecture, in a letter to *Photographic News*, June 4, deal very clearly with the matter, and say "that for architectural and most branches of ordinary photography the swing-back is quite unnecessary, and is, at best, only *a clumsy makeshift*, but that it has hitherto been indispensable, simply because there existed no other means whereby *the requisite relative positions of lens and plate* could be obtained when photographing a lofty object from a near standpoint. Mr. Sanderson has designed his camera expressly to meet this requirement." Asking your pardon for the length of this letter,—I am, yours, &c., F. H. SANDERSON.

Cambridge, June 9, 1897.

RE "DOGBERRY," COATING LARGE PLATES WITH COLLODION.

To the EDITORS.

GENTLEMEN,—"Dogberry" says that "fully a pint of collodion would have to be used, or, at any rate, poured on to the glass to get an even and satisfactory coating on a 24 × 18 plate." I have coated hundreds of plates over 24 × 18, and up to 54 × 36, but never took the trouble of measuring the quantity used; at the same time, on reading the above statement by "Dogberry," it struck me as somewhat excessive, so I determined upon making the experiment, and here is the result. A plate 24 × 20 was taken, 10 ounces of collodion were put into a measure, and the plate coated. I poured out the collodion until "instinct" told me I had enough on; this quantity was exactly 4½ ounces. Of this, 2 ounces were returned to the measure, leaving 2½ ounces forming the film of a plate 24 × 20. I must confess that this was a surprise to me. I anticipated at least 3½ to 4 ounces, but actual practice shows that to be wrong.

Taking the cost of commercial collodion at 6*s.* 8*d.* per lb., this gives the cost of collodion at 10*d.*, and, allowing a little for waste, a 24 × 20 would average 1*s.*; to form the sensitive bromo-iodide of silver with the excess brought out of the bath on the surface about 10 grains of nitrate of silver, and to allow for waste, &c., 60 grains in all will probably be absorbed; 60 grains of nitrate of silver at 4*s.* per oz. would cost a fraction under 8*d.*, but we will be liberal and say 1*s.*, so the cost of collodion and of silver for a sensitive wet plate would be 2*s.*, and making all due business allowances for wear and tear and cost of apparatus, &c., used, I think 5*s.* will be an extremely liberal estimate as to the cost of a wet-collodion plate. Now, I have not written this in any carping spirit, but just to furnish a little fact where "Dogberry" acknowledges himself deficient, as I quite agree with the statements made as to the cost to *an amateur* who only did a few plates and those at long intervals.—Yours, &c.,

W. T. WILKINSON.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

William Harrison, Frewaigne Braddan, Isle of Man.—*Photograph of painting and photograph of storm at Douglas Bay.*

John Stuart, 120, Buchanan-street, Glasgow.—*Two cabinet photographs of the Rev. Jas. Troup, M.A., Congregational Church, Helensburgh.*

J. A.—The lens named will answer for the purpose mentioned.

W. C. B.—Try the method of intensification described by Mr. F. P. Wratten in the JOURNAL of May 21.

JOHN G. WILLIAMS.—To make yourself legally safe, we think an assignment of copyright would be necessary.

W. L. JENKINS.—The article appeared in the JOURNAL of January 8, and you can obtain a copy from our publishers.

HALCYON.—Obviously the matter is entirely one for individual decision. We see no reason for supposing that the step referred to will be unsuccessful.

J. H.—1. You probably mean the aphengescope. This is described in most books on optical projection, and in lantern-dealers' catalogues. 2. No, that should not be so.

F. W. URQUHART.—We do not remember to have seen the exact style of photograph before. The result is pleasing, but we should hardly think it worth patenting unless it is your intention to dispose of the method.

ARREARS OF SALARY.—PRINTER. It is a matter for the County Court, where you must sue for the arrears due to you, and for one week's salary in addition, through being discharged without being given a week's notice.

A. W. L. DIXON (Nottingham).—We have no further information than that contained in the article. Better inquire of some firm of French dealers whose addresses you will find in the ALMANAC. We do not answer questions through the post.

C. H.—Your chances of success would probably be a little, but not much, better than at home. Our own idea is that there is greater scope for photo-mechanical work than ordinary photography. We do not advise you to make the exchange purely speculatively.

F. T. BELL.—We do not think the reducer, *per se*, is at fault. We should be inclined to attribute the markings either to impurities in the chemicals employed or to hypo having been left in the film. It is as good a reducer as any that we know, and can hardly be improved on.

LENS.—OXON. The picture sent is very unsharp indeed, but that does not indicate that the lens is faulty, because it may be wrongly adjusted on the camera. You say it is at fixed focus. The maker of the lens has a good reputation, and is scarcely likely to issue a faulty instrument. See if it is fixed at the right focus.

INDIARUBBER.—H. HANDS writes: "Will you say, through Correspondence column, how can I prevent indiarubber pneumatic holders from cracking? how can I remedy same? One I have is quite as soft as when it came, but is cracking in several places."—In reply: We know of no method by which the perishing of indiarubber can be prevented. We believe none exists.

FERROTYPES.—AN AMATEUR asks: "Will you oblige me with directions for ferrotype photography? 1. What to coat the plates with? 2. How to sensitise them, and whether to be used wet or dry? 3. What developer to use for the same?"—Our correspondent is referred to p. 761 of the ALMANAC for last year. The same directions as for glass positives will answer for ferrotypes.

SPOTTY PRINTS.—E. PENFOLD writes: "Can you please tell me if the spots on enclosed print are due to imperfect fixation or contamination in the water? I had used, unknowingly, rain water unfiltered for my toning."—The spots are not due to imperfect fixation. They clearly arise from contamination by foreign matter of some kind. Particles of iron in the washing waters, for example, would cause similar spots.

PHOTOGRAPHING PLASTER CAST.—AJAX says: "I want to photograph a white plaster cast of an inscription in Egyptian hieroglyphics. The characters are in relief. Being all one colour, I find I get hardly any distinction between the characters and the background. If I develop sufficiently to get a white background in the print, the characters do not show at all. Will you kindly tell me how I should proceed?"—In a case of this sort it is simply a question of the illumination of the subject. If the illumination be by direct front light, little of the inscription will be seen; but, if it be lighted by a strong side light, there will be no difficulty, provided too much exposure is not given.

SUSPECTED MOUNTS.—R. S. E. The mounts may be at fault, as you surmise, but they would not account for the yellow stains on two of the prints. These stains are unquestionably due to faulty fixation, the prints being allowed to stick together while in the fixing bath. If careless manipulation is the cause of part of the trouble, may it not also be the cause of the other? We do not undertake the testing of mounts for a small, or any other, fee.

VARNISH FOR COLLOTYPES.—GILBERT puts the following query: "Will you kindly say what varnish is used for the collotypes now sold, where I could obtain it, or information how to make it? I failed at Penrose's and other houses."—The varnish used for collotype prints is usually an aqueous solution of lac. This is obtained by boiling bleached lac in a solution of borax, say, one part borax, twenty parts of water, to five parts of lac. The solution is diluted according to the gloss required, and filtered before use.

CAMERA STAND.—J. H. SALMON writes: "Would you kindly give me advice on the following subject. I have a 12×12 portable studio camera, and use it for out-of-door work, but find it very heavy and unmanageable on the ordinary three-legged tripod. Could you suggest anything that I could fix on the tripod top, or could I have anything made in the way of a tripod which would be better for outdoor work?"—Evidently our correspondent is using a stand with too small a top. Let him get one with a larger top, so that there is more spread of the legs at the upper part.

GALLIC ACID.—S. PILKINGTON.—We have not tried gallic acid as a developer for the plates mentioned, so cannot express any opinion as to its merits. Gallic acid is not so energetic a developer as pyrogallic acid; furthermore, it is very insoluble in water as compared with pyro. However, its solubility may be increased by dissolving in glycerine and then adding water. In this way a solution of twenty or more grains to the ounce may be obtained. We do not imagine you will find much gain by its use, but rather the contrary. Try the experiment, and let us know the result.

BLEACHED LAC.—T. REED says: "I have tried several samples of bleached lac, but I find, on dissolving them in methylated spirit, that they do not wholly dissolve. A friend of mine, a German, tells me that white lac ought to dissolve and make a clear solution without sediment. Is that the case?"—All the English samples of white lac we have had to do with have behaved as our correspondent has found; but we have had samples of lac, bleached in Germany, that make a perfectly clear and transparent solution when dissolved in spirit. They were bleached in a different way from the English lacs, however.

PHOTOGRAPHY IN THE COLONIES.—THOS. GEORGE SAYS. "Can you give me any opinion as to the chances a young fellow has, with a capital of about 150*l.*, of starting business in a large town in any part of the colonies? I have had a year's experience in the profession. I suppose the work in the colonies is much inferior to what it is here?"—What chance our correspondent stands we are unable to say, but we think very little with the capital mentioned. Establishments in large towns in the colonies are quite as lavishly fitted as they are here, though, as a rule, they are more costly to fit. Our correspondent is under a misconception as to the quality of the work. Colonial work is quite up to the standard of that here, and, in many instances, beyond it, both technically and artistically.

TONING BATH.—J. H. M. writes: "Would you kindly tell me a formula for a combined toning and fixing solution that will tone slowly in warm weather? The one given on page 876 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC seems to me to be a good one, but tones too rapidly in this warm weather for the results to be permanent. The Eastman Company give a formula for this paper, but it seems to discolour the whites of the paper more than the one given in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC. Would it do to add alum to the latter? If so, how much? I use the Ilford P.O.P., mauve."—We do not know to what formula our correspondent refers, as there is no reference to a toning bath on the page quoted. However, if the bath, whatever it is, be diluted with water, it will tone more slowly. The use of alum is not to be recommended if the bath contains hyposulphite of soda.

VARIOUS.—JUSTICE asks: "Would you mind giving me the answers to the following: 1. In photographing a church for sale, have I to get the Vicar's permission? 2. If I snap-shot a group of people, with a building coming in the background, and then show it in the window, or reproduce it on a screen, can I be interfered with? 3. What are the qualifications necessary for a photographer to get letters at the end of his name, and then to be reproduced on his mounts, &c.? 4. What must be added to the ordinary ferro-prussiate paper so as to quicken the printing of it? 5. Can I add any ingredient to the ferro-prussiate paper so as to make it print a darker colour, say black?"—1. If you have obtained the photograph, it is not necessary to get the Vicar's permission to sell it, except as a mark of courtesy. 2. No, we think not. 3. If you had read the JOURNAL of last week, you would not have put this query. 4 and 5. In the ALMANAC for 1889 will be found a method by which the exposure may be shortened by developing the picture, also methods by which the blue image can be changed to several other colours. Space in this column is too limited to give them with necessary details.

*** All communications and advertisements intended for the next number of the JOURNAL should reach the office not later than the first post on Monday morning, June 21.

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EX CATHEDRÂ.

We gather from *Nature* that a Röntgen Society has been formed, with Professor S. P. Thompson as the President. The intention of the founders is that the Society shall occupy a position between those devoted purely to medicine, to physics, or to photography. Some of the members will study the sources of the Röntgen rays, others the applications; some the induction coils, others the tubes and the various forms and adaptations of the apparatus used in the production of the rays. Röntgen photography, as our contemporary points out, has been found serviceable in so many branches of scientific investigation that the Society appeals to a large constituency for support. It should be the means of increasing the efficiency and applications of the rays, and should also be of assistance to surgeons and others who have entered the new field of work without previous training in physics.

* * *

The Catalogue of the Imperial Victorian Exhibition at the Crystal Palace has just been issued. The Photographic Section occupies about twenty pages, and there appear to be between 400 and 500 exhibits in the section. Catalogues of this kind are deserving, as they often receive, permanent preservation; moreover, large numbers of them pass into the hands of casual visitors to the Exhibition, possibly not over-familiar with the nature of the exhibits. It is, therefore, to be regretted that, as regards the Photographic Section, a little more information relating to many of the exhibits is not given in the Catalogue. The printers appear to have withheld many brief notes identifying the originals of portraits, descriptive of processes, indicating where the interest of an exhibit lies, and so forth, without which the Catalogue will be a meaningless, if not a useless, guide.

* * *

The veteran microscopist, Mr. W. H. Walmsley, of Philadelphia, sends us some excellent prints of microscopic sections, the negatives for which were made by the acetylene light. Mr. Walmsley adds: "They are printed on a paper introduced here within the past year under the name of Velox, which seems to be a most valuable one for this purpose. It is a bromide of very low degree of sensitiveness, and may be developed with almost any of the developing agents now in use. It is printed on both matt and glossy surfaces." The rapidity of the paper may be roughly estimated from the fact that one of Mr. Walmsley's exposures was four minutes to a one-inch burner oil lamp at a distance of six inches, the developer being amidol.

* * *

The strange appearance which the numerous stands, hoardings, and scaffolds presented in the streets through which the Royal procession passed on Tuesday last is well shown in a series of illustrations which appeared in last week's *London*, an energetic publication devoted to municipal life.

* * *

The International Printers', Papermakers', Stationers', Photographers', and Fine Art Publishers' Exhibition was opened on Wednesday last at the Agricultural Hall, Islington, N. At the inaugural luncheon Sir Philip Magnus took the chair, and in the course of a speech, in which he proposed success to the Exhibition, paid a handsome tribute to the important part which photography plays as an adjunct to the press. The Exhibition, which remains open to the 30th instant, is fully representative of the printing industry, and will well repay a visit by the many thousands of Jubilee visitors now in town. The Photographic Section, which has

been organized by Mr. Alexander Mackie, is a really good and representative display of work. Printing machinery in operation forms a very attractive part of the Exhibition, which includes X-ray and cinematographic displays.

* * *

An old friend, Mr. J. Frankland, the well-known photographer, of Blackburn in the course of a communication just received from him, remarks: "I know you want to keep up to date, so I forward you what the writer" [of the annexed circular] "considers the latest novelty." The circular which Mr. Frankland encloses emanates from the north of England. We reproduce it in its entirety. Some reader may have tested the value of the novelty?

* * *

"I have the latest novelty in the photo business. It is a new system of business to draw trade—a system by which you soon have all your customers canvassing for you and bringing you fresh customers in ever-increasing numbers and at very little expense to yourself, and your canvassers cannot handle the money. It is superior by far to any club system at present devised. There are men making fortunes at it in and around London, but it is unknown here. A business started and carried on according to this system in every case doubles itself every six weeks right through the year, no matter what the weather. It is a good thing and genuine, and I can place in your hands the whole secrets of the system and the copies of the printed matter connected with it, with full instructions, which, when you have read, you will say is well worth 5*l.*, and I will undertake to place the whole thing in your hands for 10*s.*, or, if you wish to have the exclusive use of it yourself for your town, I will treat with you if you make me an offer. There is no patent or registered matter about it, but it is simply a trade secret jealously guarded by those who know it and the value of it, and it is a real godsend to any one who gets hold of it and is able to use it. If you care to have it, and send me a 10*s.* postal note, I will send by next post copies of printed matter required, with instructions and hints, and I will undertake to say that, if you work the system as I instruct you, your business will go up by leaps and bounds."

* * *

As part of their Jubilee decorations, the Eastman Company have been exhibiting, on the front of their Oxford-street offices, a mammoth enlargement of a portrait of Her Majesty the Queen. The size of the picture is eight feet by six feet, and the enlargement is made upon Eastman's bromide paper, from a negative by Mr. James Thomson. Smaller copies of the same portrait, about four feet in height, are being shown at other branches of the firm.

* * *

Mr. Drage, the Hon. Secretary of the Convention, asks us to announce that there is still some space available in the Great Yarmouth Town Hall, in which the Convention Trade Exhibition will be held. There is only a small charge for wall space, and exhibits may be addressed to the care of the local Hon. Secretary, Mr. Harvey George, at the Town Hall.

* * *

The journal of the Camera Club draws attention to the importance of increasing the town members of the Club. So far, it states, the Club has had a considerable increase, but chiefly in country members, who, although useful and desirable, do not add materially to the Club funds. It is feared that old members may be impressed with the idea that, because there has been an increase, nothing more need be done; but it must be pointed out that there is still room for town members, and it is necessary, for the Club's success, that more should be elected, as they not only contribute a larger subscription, but also use the Club for general purposes. Any new town members now joining pay 10*s.* per month for the remainder of the year.

* * *

Under the title of the Pure Acetylene Gas and Carbide Company, a company has been formed for the purpose of acquiring and working certain patents granted to the eminent Swiss chemist, M. Raoul Pierre Pictet, for improvements in the manufacture and purification of acetylene, and for improvements in the process and apparatus for the production of carbide of calcium. The Company proposes—(1) To manufacture and supply carbide of calcium for home trade and export. (2) To manufacture and supply pure acetylene gas: (*a*) For the supply of towns, villages, &c., by mains, precisely as is now done with coal gas. (*b*) For the supply, by special installation, of large buildings, such as public institutions, manufactories, &c. (*c*) For the supply of houses, shops, offices, &c., by means of portable cylinders containing acetylene in liquid form. (3) To manufacture and supply apparatus by which users can produce and supply themselves with pure acetylene on their own premises.

THE SWING BACK.

In our previous article we dealt with the distortion in a photograph caused by tilting the camera, which shows itself in the form of slanting of the perpendicular lines, and the effect of the swing back in rectifying such errors. But we have often heard it alleged that, in correcting that form of distortion, the swing back itself produces another kind, which for purposes of distinction may be called "vertical distortion;" that it, in fact, produces an alteration in the proportionate height of the objects depicted. This, it is our purpose to show, is another misconception; but, as such a form of distortion is actually produced by swinging the back of the camera under certain circumstances, it may be worth while to consider, in as brief a manner as possible, where this misconception arises.

For the purpose of explanation we propose to examine what takes place in photographing a geometrical diagram at close quarters, as, though the conditions differ somewhat from those that prevail in ordinary landscape or architectural photography, the principles involved are precisely the same, but the effects of the various movements are exaggerated and brought into greater prominence, which is what we require for the purpose. Nothing answers the end in view better than a simple parallelogram, of as large dimensions as may be convenient, ruled or divided into squares of equal size after the manner of a chessboard. A sheet of newspaper ruled in such a way can be easily attached by means of drawing pins to the wall of an ordinary room and the camera placed upon a level table, when the observations can be made with the greatest ease and accuracy, the printing enabling the definition of the image to be judged, when desirable, at any portion of the field of delineation.

Let us suppose, then, that the camera, fitted with a lens of the rectilinear type, or one capable of yielding straight lines,

is placed upon the table, two pencil lines, crossing one another at right angles, having been first accurately ruled on the focussing screen in a horizontal and a vertical position respectively. In front of the camera, on a fairly well-lighted wall, let the diagram be hung or pinned in such a position that its centre coincides with the axis or centre of the lens, which may be known by the centre horizontal and vertical lines of the drawing coinciding exactly with those drawn on the ground glass. If a plumb line applied to the drawing shows that it is truly vertical, then everything is ready for our examination.

Now let the image be accurately focussed upon the ground glass, with the back of the camera in the vertical position and the full aperture of the lens. This latter condition enables us the better to judge of the relative effect produced on the definition by the various movements, as, by the introduction of a stop, especially a small one, very considerable alterations may be made in the position of the focussing screen without materially affecting definition. Under the conditions above named, an image will be produced of the diagram or chart precisely resembling it in every particular; that is to say, not only will its boundary lines bear the same relationship to one another in size and position, but the same will hold good with the divisions, and the compasses applied to these will show that they are of precisely similar size throughout. The definition will be even over the whole surface so far as the capabilities of the lens admit, that is, there will only be the natural falling off from the centre to the edge.

Now bring the swing back into play to its fullest extent, it matters not in which direction. We shall now have an image of the chessboard, in which the perpendicular lines slope uniformly from one end to the other, according to the direction of the swing, so that one end of the parallelogram is represented as considerably narrower than the other. This is the form of horizontal distortion referred to in our previous article. If the swing back be of the most perfect kind, and swing from the centre, the dividers will show that the length of the central *horizontal* line has undergone no alteration in size, or practically none. If the swing were from the centre of the plane of delineation, instead of slightly in front of that centre, there would be absolutely no alteration in length of the middle line, nor of the position of the image on the plate; but, under ordinary circumstances, the image will be either raised or lowered a little on the plate, but there is scarcely likely to be any appreciable alteration in the length of the central line. As the parallel lines recede from the central horizontal one, they will be found to alter progressively in length, those on one side becoming larger, on the other smaller, and the change in length proceeds continuously from top to bottom, or bottom to top, as the case may be.

If we next examine the vertical lines, we shall find that, while the central one retains its absolute perpendicularity, each one of the others has acquired a certain inclination, which increases as they get farther from the centre, the distortion in this case, it will be noticed, proceeding symmetrically from the centre outwards, and not continuously from end to end, as in the previous case. But it does not finish here. If we apply the compasses, we shall find that, though the length of the lines necessary varies in consequence of their slope, the top of the figure is parallel with the bottom; but, if we compare the length of the central one, which is the height of the figure, with the central horizontal line, which, as we have seen, remains unchanged, we shall find that the height of the square has been very considerably increased. If we extend the examination to the individual squares, we shall discover that this increase of size in the vertical direction is not distributed evenly over the whole surface, for the divisions are largest at the bottom or broadest part of the figure, and become gradually smaller as they approach the top or narrow end. One half of the original square is, in fact, squeezed into a smaller space, while the other half is stretched out, the stretching being much greater than the condensation, so that, as a result, the whole figure is increased in length. The original chess board has been, in fact, converted into a section of a truncated cone, and the smaller squares into irregular figures, varying both in size and shape in every part of the image. Thus we see that the swing back does actually cause distortion, not only laterally, but also vertically.

Now, if it has not been so already, let the back be inclined with its upper part nearest the lens, as it would be placed to rectify a sloping perpendicular, and tilt the camera until the back becomes vertical again, which can easily be done by propping it up with a book of suitable dimensions. Now alter the position of the diagram, raising it to such a height on the wall that it occupies the same position on the focussing screen as before, or until the horizontal and vertical centre lines coincide with the marks on the ground glass. We now have an opportunity of studying the effect of tilting the camera and the compensating action of the swing back.

But, before proceeding to that examination, take the book from under the camera, restore the back to its vertical position, and raise the sliding front, carrying the lens as far as it will go. It will, in all probability, not rise to anything like the distance required to get the whole of the diagram on to the screen, but sufficient of it will be there to prove, on examination and measurement, that the image remains entirely unchanged, except for the loss of definition. With a small stop this may be restored, and we then have an image precisely similar to the one formed with the diagram on the lower position; but, with the full aperture of the lens, the definition will be very bad, but can be improved by focussing, that is, by altering the position of the ground glass. Then we shall find that, though the image retains its correctness of outline and of proportion, it has become generally smaller, owing to the fact that the diagram has been removed further away, and the focal distance consequently shortened.

However, in actual architectural work, such conditions would not prevail, and, where the covering power of the lens permits it, raising the camera front while keeping the camera horizontal would appear to be, as many of our most practical workers deem it, the best way of avoiding converging perpendiculars.

But to return to our observations of tilting. Let the camera be reinstated in position, with the image of the chessboard duly centered, and the swing back in its normal position, at right angles to the axis of the lens. On examining the image, it will be found to be essentially similar in character to that already described as produced by the use of the swing back, with converging vertical lines and general disorganization of the proportions of the chart; but—and here is the whole gist of the matter—*the distortion is in the opposite direction to that produced by the swing.* In other words, while, if the swing is used as it would be for the correction of converging perpendiculars, the upper portion of the diagram would be widest on the focussing screen, when the camera is tilted, the reverse is the case, as every one knows, and the height of the object,

instead of being increased, as it is by the swing back, is reduced by tilting. This places the whole question of the alleged incorrectness of the swing back in a nutshell. While it is quite true that by itself it is a distorting agent, it is just that fact that constitutes its value as a remedy for distortion, since it exactly balances a similar distortion in an opposite direction produced by other means, tilting the camera. If there be any doubt on the point, we have simply to swing the back of the camera, as it now stands, into the vertical position, when the image of our chessboard will bear the most rigorous examination and measurement.

Now, on the question of definition, a few words may be said, since a belief exists in the minds of some that the swing is used to correct the focus, whereas, as a matter of fact, whenever it is used *for the purpose of correcting distortion*, it is to the detriment of definition, and in the contrary direction to that required for focussing. It is quite true that in both landscape work and portraiture we employ the swing-back in order to bring objects into a better focal plane, but under such circumstances, while improved definition is undoubtedly obtained, the perspective of the picture is rendered incorrect. Take, for instance, a sitting figure with the hands on the knees "pound of candle" fashion, when the swing back is brought to bear on such a subject, the already exaggerated hands are still further magnified, and similarly, if the side swing be employed to get into focus the near side of a sheet view taken from the foot walk, the already strained perspective is thrown still further out of proportion.

If we examine the image of the chessboard diagram as given with the tilted camera and swing in normal position, and compare it with the similar one when the camera was horizontal, there will not be found to be a great deal of falling off in definition. If, as we intend should be done, the focus is taken at the centre, then there will be in both cases a slight falling off towards the edges, a little more where the camera is tilted than in the other, because, by the alteration of the position of the diagram, its top portion has been taken further away, while the hollow has been brought proportionately nearer to the plate. Now a slight inclination of the back in the contrary direction to that required for curing distortion will set matters right. Now bring the back into play and straighten the lines of the diagram, and the result on the definition will be that, while the centre remains sharp, the outside lines have lost all semblance of lines, for the top and bottom of the diagram, already thrown out of focus by the act of tilting, have been much more so by the use of the swing.

It is only by the use of a very small stop that definition without distortion can be restored, and, in extreme cases, perhaps the best definition obtainable falls very short of what is desirable. If the back be inclined in quite the contrary direction, the definition can be obtained perfectly over the whole plate with a comparatively large stop; but, then, more than the original amount of distortion is introduced.

This brings us to the third phase of the matter, namely, the correction of distortion in the after-process of reproduction, another question on which considerable difference of opinion exists and no little apparent ignorance. This must, however, form the subject of another article.

The Largest Sheet of Paper in the World.—We do not know whether the Rumford Falls Paper Mills, Maine, United States, manufacture paper for photographic purposes, but, if they do, their latest venture will break the record, as indeed it will do in any case. They are constructing a new machine which, when finished, will weigh nearly a million and a quarter pounds, and be capable of making paper 150 inches wide, thus exceeding by two inches the widest sheet yet made. It is to deliver paper in a continuous sheet at the rate of 500 feet per minute, which, if continued for a whole day, would amount to nine millions of square feet, and weigh thirty-five tons.

Non-inflammable Celluloid.—The *Revue de Chimie Industrielle* announces that M. Asselot was about to patent a process for ensuring the above condition. Ordinary celluloid is dissolved in acetone in five per cent. strength, then magnesium chloride is dissolved in alcohol at the rate of thirty-three and one-third per cent. The celluloid solution is mixed with twenty per cent. of the chloride solution, the whole forming a paste, which is intimately mixed, and then well dried. The product is then entirely uninflammable. It may be noticed, by the way, that the use of acetone is increasing in many directions, one of the latest of its uses being as a solvent of acetylene, the gas being thus made much safer, and permitting safe storage of fifty per cent. more gas than without the acetone would be safe.

The Largest Photographic Telescope.—In the annual report of the Astronomer Royal, presented to the Board of Visitors at the recent "visitation," is given a very interesting account of the largest telescope in the world which is put to photographic use entirely, the new Thompson refractor, twenty-six inches in diameter, which is now in full working order. As need scarcely be said, there are other larger instruments in use, but they are used both for eye and photographic observations. The Thompson equatorial is an almost unique combination, the same mounting carrying the old twelve and three-quarter inch Merz refractor, used now as a guiding telescope, the Thompson nine-inch photo-heliograph, and at the other end instead of the usual counterforce, a Cassegrain reflecting telescope of thirty-inch aperture, with a new photographic spectroscope attached to one end, with the six-inch Hodgson telescope arranged as a finder.

Solubility of Silver Chloride in Ammonia.—In a theoretical paper bearing upon the conditions obtaining during the admixture, under varying states of pressure, of ammonia and silver chloride, Mr. R. Jarry, in *Comptes Rendus*, gives a table of the solubility of silver chloride as follows:—

NH_3 ..	·145 ..	·294 ..	·560 ..	·624 ..	1·177 ..	1·636
AgCl ..	·049 ..	·136 ..	·344 ..	.400 ..	·468 ..	·518
NH_3 ..	2·816 ..	2·98 ..	3·019 ..	3·243 ..	3·456 ..	3·748
AgCl ..	·659 ..	·709 ..	·725 ..	·587 ..	·477 ..	·39

The remarkable fact is here shown that, up to a certain concentration, increase of strength in the ammonia solution brings about an increase in the amount of chloride dissolved, but that, when a certain point is reached, any further strengthening of the ammonia leads to a decrease in the silver chloride dissolved.

Photography at the Royal Society's Conversazione.—The annual *Conversazione* of the Royal Society was held at Burlington House on Wednesday, June 16. The entrance hall was decorated with a novel form of commemorative illumination which was exhibited by Professor Ramsay, and took the shape of tubes filled with argon and helium, and arranged to form the words "Vivat Victoria Regina," the illuminating force being obtained by means of electric discharges. In the office Lord Kelvin illustrated the electrical effects of uranium, showing that that metal has much the same powers in relation to the New Photography as the X rays. These latter were also in evidence, for, in the archives room, Dr. John Macintyre showed "apparatus for exciting high vacuum tubes for X-ray work," there were also illustrations of the advance that has been made in the direction of the rapid production of photographs and of cinematographic films. Mr. A. A. C. Swinton, one of the best-known exponents of the New Photography, gave some inte

esting experiments in the Council-room, showing, among other ovelties, the possibility of illuminating an incandescent lamp by lectro-magnetic waves through six feet of space, and also how a imilar illumination can be obtained by utilising the human body as he medium of connexion. Cathode and analogous rays were also he subjects of some interesting experiments in the Council-room by 'rofessor Silvanus Thompson, who exhibited vacuum tubes showing he results upon the rays of various forms of electrification. In the leeting-room Mr. J. Norman Lockyer exhibited with the lantern a eries of photographs illustrating the arrangements of the 1896 clipse expeditions at Kiö and Novaya Zemlya; and, in the same lace, Mr. W. H. Preece and Signor Marconi gave demonstrations of heir respective methods of signalling through space without wires.

A Röntgen-ray Tube with Automatical Adjustable Vacuum.—Mr. H. Lyman Sayen recently read, before the Electrical Section of the Franklin Institute, a paper describing a new tube he had devised, which was in every way superior to any hitherto constructed modification of the Crookes' tube. The great im of tube-makers has been to design a tube which should be free rom the hitherto inherent defect of a constant rise in the vacuum ollowing their frequent use. Many forms have been proposed, but, or reasons given in this paper, have not been successful. In the ew tube the desired end is achieved by having a small bulb, containing a chemical which gives off vapour on being heated, and reabsorbs it upon cooling, directly connected to the main tube, and urrounded by an auxiliary tube which is exhausted to a low Crookes' vacuum. Mr. Sayen strongly advises the use of a spark ap placed in series with the tube and secondary, for the purpose of voiding the blackening of the tube. He says: "I will conclude ny paper this evening with a brief summary of the advantages which I think a tube of this kind possesses over the ordinary type. First, adjustable vacuum: it may be set at any vacuum desired, rom one so high that no current will penetrate it to one so low hat the current would rather go through the tube than jump over a arallel spark gap of a half inch. In a radiograph of the hand, for nstance, it is desirable to use a low vacuum to secure the necessary ontrast between bone and flesh, while, in locating foreign metallic odies in dense tissue, it is desirable to use a high vacuum. Second, utomatic regulation: at whatever vacuum it is set it will remain, o long as the coil is running, without any attention whatever from he operator. Third: it will stand considerable energy without decrease of vacuum, consequently shortening the time of exposure necessary. Professor Arthur W. Goodspeed, of the University of Pennsylvania, has taken his best radiograph of the hip in three minutes with one of these tubes. He has also taken an excellent one in one minute. Dr. Wm. M. Sweet, with the tube adjusted at high vacuum, has located foreign bodies in the eye, the pictures being taken perpendicularly across the head, with an exposure of thirty seconds. Fourth: a long lease of life."

DIAPHRAGMS FOR THE HALF-TONE PROCESS.

Much has been written during the last year or two on the above subject, but, I fear, without conveying to the mind of the average worker the root idea involved in the departure from the orthodox round diaphragm. Further, the multiplicity of forms suggested for half-tone diaphragms has confused the question as to which are really useful. It is one thing to suggest half a dozen different forms of diaphragm openings which will bring about a certain result, but the material point is as to the most practical shape for every-day work. I am so often asked questions on this matter that I think a plain statement is wanted on this subject.

Setting aside all theory, let us try to consider the action of the screen in the most elementary manner. Suppose we place a cross-line screen, rolled diagonally to its sides, in front of the sensitive plate, and as close as possible, and we make an exposure with lens at full aperture. The result, it may safely be predicted, will be that the screen formation is not visible on the negative, or, if visible, is so blurred as to form no breaking-up effect. If another exposure is tried with, say, *f*-16, still maintaining the round aperture, the result will be markedly better, the negative showing a system of round dots, but very likely ill defined, and the spaces between veiled. The operator would argue logically that a still smaller stop ought to bring matters right. So he goes on reducing the aperture and certainly getting more sharpness of dot and more transparency in the clear spaces; but another difficulty crops up, the dots refuse to spread to the point of touching each other, as the operator knows they should do in order to produce a perfect print on the metal plate which is prepared for etching. The result of this want of joining up is that the print has a cross-line effect instead of consisting of isolated or nearly isolated dots, and the picture looks flat and dark.

This was the difficulty met with by all early workers with the cross-line screen, and many despaired at first of being able to use it. They argued, How was it possible to get isolated dots on the zinc plate from a cross-line screen? The light penetrating the screen would give dots on the negative, but, when the negative was printed, the result must come back to a counterpart of the screen. Thus some operators went so far as to make a transparency of dots from the cross-line screen in order to get the negative to yield a dotted print. We now know that this was a foolish and round-about way of going to work, when the same end could

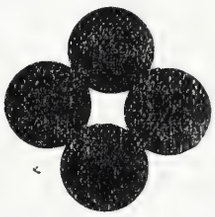


Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig 6



Fig. 7.



Fig. 8.

have been obtained by making the negative dots spread by exposure until each one touched its neighbour at a point of its circumference. The effect of this would be that that part of the sensitive plate which lay under the crossing of the lines, and unaffected by light, became the transparent or printing space of the negative, and would be hemmed in by the sides of four dots disposed as fig. 1. This is a point I wish to emphasise: The printing part of the negative—the space which produces the dot—is only formed by an indirect action, through being closed in by the parts which are produced by the action of the light. We may compare this transparent space to a piece of soft wax, or other plastic material, pressed from four sides by four cylinders. If the latter were not all touching each other, the wax would ooze out between them, but, if they are all touching, the wax must assume in end section a pincushion shape (fig. 2). This, then, will be the shape of the opening formed by four round dots coming together on the negative, and it can be understood that there must be a very thin margin of opacity between the corners of each transparent opening and the neighbouring opening, because of the corners being pointed.

I dare say it puzzled the earliest operators with the cross-line screen to account for the fact that the square openings of the screen gave round dots. But it was just the sort of paradox to cause the intelligent operator to reflect, and it was probably by some course of reasoning on this point

that Mr. Ives adopted the theory that each opening of the screen acted as a pinhole lens, and photographed the shape of the diaphragm. A round diaphragm having given a round dot, quite irrespective of the shape of the screen opening, it was quite natural to conclude that a square opening would give a square dot, and it was easy to put the idea to the test. The result was as anticipated; and, as it was found that the square dot (fig. 3) removed the pincushion-shaped opening which gave the operator so much trouble, the square diaphragm came into use.

As may be supposed, the success of the square diaphragm led to many other shapes being tried, with the result that the pinhole theory was amply proved, each different shape making the dot conform to it. The most important discovery, next to the square stop, was in the fact that a slit-shaped stop extended the dot in whichever way the slit was extended. Thus, if the slit was vertical, it gave oblong dots disposed in a vertical direction on the plate, whilst, if laid horizontal, the oblong dots lay like courses of bricks. But a more curious fact was discovered, viz., that if the slit opening was placed in the same direction as the lines of the screen, it would, under certain conditions, give a continuous single line, obliterating all trace of the crossing line. It may be assumed that it was this discovery which led to the adoption of the square stop with extensions at the corners, the object of which is to make the dots spread at the corners, and consequently further under the screen lines than the ordinary limits.

The reason for this is that the dot given by the square stop is only approximately square. It has a tendency to round off a little at the corners, so that, although it gives a better closing up than the round dot, there is still something to be desired. Thus it was argued that, if the light could be made to spread under the screen lines by a suitably extended slit opening, the corners of a square opening could be similarly extended so as to promote spreading. In this way the rounding off of the corners could be compensated. This idea proved quite as practical and successful as the adoption of the square stop. The obvious pattern that would suggest itself for such a stop would be with diagonal extensions at the corners (fig. 4), but Mr. Max Levy introduced a curiously shaped stop (fig. 5), which he claimed would give a better result.

I dare say it has puzzled a good many operators to determine the reason for extending the corners in different directions, and I have heard it argued that such a stop must give a spreading in different directions, so that the corners would be unsymmetrical. The operator must, however, consider not what would be the effect of the stop in making one dot, but the result of all the dots running into and overlapping each other. A corner extending in a horizontal direction overlaps one extending in a vertical direction, and thus produces symmetry. The same thing would occur if there were only two corners extended, provided they were both on one side of the main square opening (fig. 6). If, however, the two extensions were at diagonally opposite corners, the effect would be an elliptically shaped dot, as the opening would act practically as a slit. This circumstance is taken advantage of in colour work when it is desired to make the grain run in a certain direction so as to obviate the formation of pattern, or *moiré* effect.

These diaphragms with extended corners have to be used judiciously, or will produce abnormal effects totally different to what is desired. For instance, if the extensions are made too large, or the exposure is carried too far, a cross-line effect will be produced on the negative instead of well-defined dots, and the negative will not yield a proper print.

Another diaphragm which possesses novel features is that illustrated in fig. 7. It was, I believe, introduced by Mr. Max Levy for half-tone work, though such diaphragms have been used for a long time past in microscopic investigation. The form I prefer myself is as fig. 8. The object of such a stop is to shut off the central point of the light, so that the effect is to carry on the action at the margins of the dots. Mr. Levy explains that the exposure through this stop acts only on the portions of the sensitive plate between the intersections of the black cross lines, and the highest lights are in this way almost entirely acted upon without apparent detriment to the other portions of the picture.

To explain this more clearly, let it be remembered that the light acts most intensely at a point on the plate opposite the centre of the screen opening, and with least intensity under the centre of the crossing of the lines, there being a gradual falling off in the density of the dot from the former towards the latter point, where, of course, the negative should be perfectly transparent. It too often happens in practice that in attempting to push the spreading of the dots under the screen lines, in order to get the high lights to close up, the dots in the shadows become too large because the action is going on there simultaneously, though to a reduced extent. The idea, therefore, in forming a stop with the centre blocked out, was to retard the further action of the light on the shadow dots, and allow the spreading operation to go on in the high lights. This is especially useful in the case of flat subjects or where the high lights are degraded, for it is well known to operators that it is difficult to get a properly closed-up negative unless the high lights are brilliant—approaching as nearly as possible to whiteness. I do not mean to say that the half-tone operator should always be provided with originals possessing chalky high lights, for, in that case, the evil would be as great as with flat prints. The ideal print to copy from is one with a nice range of gradation, neither too heavy shadows nor too chalky high lights. Where the contrast is great, the operator finds the high lights closing up before the shadows have had time to pull up, whilst, if the high lights are dull and the tone flat, the shadow dots come up too strong before the high lights have time to act. Thus the possession of stops, which will keep back either one or the other, is a valuable aid to the operator if he uses these means intelligently.

To sum up, he must remember that the use of small diaphragms is antagonistic to spreading and high-light action generally, but brings up dots in the shadows. Large diaphragms, whether round or square, promote high-light action, but do not give time for shadow dots to form. The object of a square diaphragm is to make the transparent space between the dots larger than it would be if a round one were used. The object of extending the corners is to promote joining up in the high lights. When the joining up cannot be obtained except at the expense of gradation, *e.g.*, where the high lights do not join quickly enough, then the stop with central part blocked out is useful. These, therefore, are fundamental diaphragms for the half-tone process, and, whilst similar ends may be obtained by variations, it will not be found that there is much to be gained thereby.

This latter remark, however, is not intended to apply to variations of shape in diaphragm apertures with the intention of altering the pattern of the grain formed by the screen, so as to destroy the monotonous effect of simply square or round dots. The investigations of Count Turati have shown that it is possible to vary the pattern of the grain to a considerable extent by manipulation of the diaphragm. For instance, wavy lines may be produced in any direction, and a second set of dots may be "dropped," so to speak, in the midst of the main dot systems, producing an effect similar to that obtained with Levy's new four-line screen.

It is necessary to emphasise the fact that it will be of little use an operator making changes in the shape of his stops unless he knows how to correctly distance his screen. I often hear the remark, "Oh, I tried that stop, but it didn't have any effect." On inquiring as to screen distance, it is usually found in such cases that the screen had been placed at some arbitrary distance which was found to work pretty well in general practice. Now, if this operator had altered his screen distance to suit the stop he was using, he might have found the way to considerably improve his work. I do not say that every operator should be a mathematician, but, when there are simple methods of finding out the screen distance by observation, there can be no excuse for being ignorant of the advantages of altering the screen distance.

The following is the method I adopt myself, and I have never found it to fail in rendering a brilliant negative with dense and sharply defined dots: If the camera has a screen adjustment gear cement on to the ground glass with Canada balsam a disc of the very thin glass used for covering microscope slides, first making a pencil cross on the ground glass before cementing the disc down. This cross is for the purpose of setting the eyepiece to the plane of the focussing screen. If the camera has no screen adjustment gear, the screen being held in the dark slide, prepare a piece of ground glass in the same way, and place it in the position of the sensitive plate so that the focussing may be done on this glass. Focus the picture sharply with the ruled screen out of range. Place a suitable-sized square stop in the lens, and bring the screen closer whilst its effect is observed with a powerful magnifier on the transparent spot made by the micro cover glass. As the screen approaches the correct distance, the dots will begin to look more square and sharply defined, and at the right distance they will look like a chessboard in the high lights. I then remove this stop and insert a small round one, the smallest in the set, giving with it an exposure sufficiently long (as found by experience) to render a small dot in the deepest shadows. Then I take the square stop used for finding the distance, and insert that in the lens in place of the other, giving an exposure which I know to be sufficient to join up the corners of the dots in the high lights. If the subject tends to flatness, I give a part of the exposure with the stop with extended corners, and in a difficult case make use of the stop with centre blocked out. Whenever I change from one shape to another, I keep to the same size of the main opening—meaning the base of the square.

Now, I quite expect to be asked what I mean by the term "a suitable-zed square stop," and some reader who has followed my instructions, nd used what he considers a "suitable-sized square stop," may tell me iat his high-light dots were all blurred, and there were no dots in the nadows. I regret that I cannot help him by making a more definite tatement, and I will explain why.

There is a constant proportion existing between the ruling of the screen, ie extension of the camera, the distance of the screen, and the size of ie diaphragm aperture, and it varies in this way: 1st, if the screen is a oarse one, a larger stop and a greater screen distance is necessary than the screen was a fine one. 2nd, the greater the distance of the lens om the sensitive plate, the larger the stop and the greater the necessary istance of the screen. Thus it is utterly impossible to say what is a uitable-sized stop without going into figures respecting the other conitions. But I may be permitted to refer the inquirer to the series of ables of screen distances prepared by Mr. Branfill, under my direction, nd checked by myself, which appeared in the *Process Year-book* for 1896. hese tables show at a glance the approximate size of stop and screen istance, and the operator can check the observed distance by means of he figures given.

There are other ways of finding the screen distance by observation, otably those described by Count Turati and by Mr. Max Levy, but they re more difficult for the average operator, and I may be pardoned for xpressing a preference for my own method, which I have well tried both y theory and practice.

WILLIAM GAMBLE.

AMERICAN NOTES AND NEWS.

Automatically Photographing the Heavens.—*Anhony's Bulletin* states that Harvard College is about to be supplied vith a new eight-inch photographic telescope, which it understands s almost completed, and which will be, when finished, one of the nost remarkable photographic instruments in existence, being lesigned to automatically photograph the heavens. The changing nd exposing of plates will be performed without any human inervention, except that the programme will be first laid out, and the nachine set to perform the operations as required. The supply of lates is furnished by means of a drum, within which is a revolving rame, carrying eight plates octagonally arranged, so fixed that vhen the telescope, having finished and exposed on one plate, eturns to the meridian, the frame carrylng the plates makes one-ighth of a revolution, thus bringing a new plate into the telescopic ield. Each exposure occupying twenty minutes, it will be seen hat plates for almost three hours' work may be carried and handled utomatically.

The Nude in Photography.—Mr. R. D. O. Smith has the ollowing sensible observations on this subject in the *Photographic Times*: "I think it probable the objections to the nude in photography will always remain, and are more likely to become, more pronounced than to be softened, and I think so for these reasons: The nude in sculpture or in painting never possesses the personality which must always attach to a photograph. The nude in art is accepted only as an ideality, and as representing the ideal figure, not as portraiture. This is not possible in photography. The ideal figure does not exist entire in any model, and the photograph does not lend itself to composition like painting or sculpture. The photograph is and must remain a portrait of the model, and the model must always fall below the ideal. The difference is the difference between nudity and nakedness. The statue is an ideality and is nude. The photograph is, and must remain, a picture of nakedness; it is simply a portrait of somebody unclothed, and it must, therefore, be as uninteresting as the same figure clothed would be, except to the prurient fancy which cares only for the nakedness. Besides all that, the camera has its own tricks, and they are too often ignored. Possibly the nude in photography may have its uses, but I do not believe they are in the direction of public exhibition like the nude in art."

The Yerkes Telescope.—We learn from the *Scientific American* that the great objective of the Yerkes telescope at the Yerkes Observatory, Williams Bay, Wis., has been successfully placed in position, and on May 21, President Harper, of the Chicago University, and a party of representative Chicagoans were present. The visitors were shown the two motions of the telescope, the clock was started, the lifting floor came up with a motion almost imperceptible, the great dome revolved, and the telescope was turned on Jupiter. Director Hale then adjusted the instrument, and President Harper was the first of the visitors to look through the greatest telescope in the world. Professor Barnard declares that it is not possible to estimate what the telescope may do for science. It may take several weeks, and possibly months, for the operators to successfully solve the problems which the atmosphere may present.

Local Reduction.—To *Wilson's Magazine* a correspondent contributes a useful note on this subject. He characterises the particular method referred so as extremely effective, and worthy of much more general application. It consists in rubbing the part to be reduced with a chamois skin and alcohol. Great results may be obtained by this method; but the writer referred to makes a mistake when he says that the black or intense portions of the negative are most affected by this friction, giving as a reason that those parts, on account of the greater deposit of silver, were raised above their surroundings, and consequently were the first to feel the effects of the friction. Theoretically this sounds very well, but practically the reverse is true; the greater the deposit of silver, the greater the resistance. Let our friend take a needle and try to scratch the negative. It will be an easy matter to do so in the more transparent parts, but much pressure will be necessary to make an impression on the dense part. "A few days ago I was required to take a picture of a new grave, laden down with flowers. For a background I had an evergreen hedge. The central floral piece was an elaborate anchor, perhaps two feet high. All was bathed in a flood of sunlight, and many leaves of the hedge, reflecting the strong light, resembled white flowers. The anchor was partly lost—did not separate well from the rest. I applied the chamois skin and alcohol to my negative, and soon the hedge receded and the anchor came out perfectly. If carefully done, a negative can be much improved in this way."

Rose des Alpes and Alizarine Blue Bisulphite.—Mr. M. B. Punnett thus describes his experiments with these orthochromatic sensitisers in the *Photographic Times:* Rose des Alpes (Thiodichlortetraiodo fluorescine) and alizarine blue bisulphite have been recommended, according to reports, by Dr. Eberhard of Gotha as colour sensitisers. The following is said to be his formula:—

Water	100 c. c.
Alizarine blue bisulphite (1:500)	100 „
Rose des Alpes (1:200)	2 „
Ammonia (sp. gr. 0·91)	1 „
Silver nitrate (1:40)	46 drops.

As the alizarine blue bisulphite is a pasty mass, in making up my stock solution I took a little more than the formula called for, to be certain I had enough. It did not seem to dissolve thoroughly until the ammonia, which was a trifle stronger than the formula requires, was added. Plates were bathed two minutes and dried over night. In daylight they showed greenish-yellow streaks. Tested on a colour chart with an aurantia screen, they proved foggy and possessed no more colour sensitiveness than a regular Seed plate. In my next experiments I used the following amounts:—

Water	500 c. c.
Alizarine blue bisulphite (1:1000)	100 „
Rose des Alpes (1:1000)	100 „
Silver nitrate (1:1000)	100 „
Concentrated ammonia	10 „

After filtering, some of Seed's non-halation plates were bathed in it under the same conditions as with the previous formula. In testing, they were compared with plates bathed under similar conditions in the following bath:—

Erythrosine (1:1000)	100 c. c.
Silver nitrate (1:1000)	100 „
Water	500 „
Concentrated ammonia	10 „

The above-mentioned yellow screen and chart were used, and they (the plates) were found to be not quite so colour sensitive as the erythrosine silver plates, with the exception of to the red rays, which appeared to act comparatively a trifle stronger than on the erythrosine plates. Further experiments showed that the sample of alizarine blue bisulphite which I possess has but little colour-sensitising power, and that the colour-sensitising power of the bath mentioned was due chiefly to the Rose des Alpes, which has not, however, in my hands proved as powerful as erythrosine. While on this subject, I would like to call the attention of those interested in the subject to a simple method of

distinguishing between eosine and erythrosine. Eosine in a dilute solution is red by transmitted light, but greenish-yellow by reflected light, that is, it is fluorescent, while erythrosine is not fluorescent, but is red when seen either by reflected or transmitted light.

The Tonograph.—In the *Scientific American*, Dr. H. Holbrook Curtis, M.D., has a series of illustrations which show the figures produced by singing under a tense rubber membrane stretched over an inverted bell jar or curved tube made of metal. The notes of the chromatic scale have been reproduced from photographs taken from a disc of dental rubber dam stretched over a tin horn, the tonograph curved to roughly represent the external meatus or outer tube leading to the ear drum. Any one, says the Doctor, may produce pictures of the octave with its half, quarter, and fractional tones, for the membrane, when treated properly, becomes far more sensitive to the exact pitch than the human ear. The preparation of the rubber membrane is the only difficult part of making the apparatus, for the membrane must be very homogeneous and of equal tension. The simplest way to construct a disc of equal tension in all directions is to lay a ten-inch square of dental rubber dam on a smooth surface, and make a few concentric circles with a pencil around a ten, twenty-five, fifty, and one-dollar silver piece respectively. Next we take an eight-inch round embroidery stretcher and press the outside ring over the inner, putting the rubber on the frame as one does a piece of cloth. The membrane is next pulled in all directions to put it on the stretch, care being taken to keep the pencil circles from losing their shape and becoming eliptical. When the membrane is moderately stretched, the frame is overhanded with thread or glued. The diaphragm thus prepared may now be taken and pressed down over the funnel-shaped end of the horn, the funnel being five or six inches in diameter, the horn about three. By keeping the wooden frame equally distant from the edge of the horn, and making forcible downward pressure, we get a membrane as nearly homogeneous in tension as possible, and the nearness of the outer pencil circle to the rim will show just how tense it is. When the membrane is quite like a banjo or drum head, we simply tie a cord around the rim of the horn, and release the frame, which it is best to leave as part of the machine for future adjustment. If it is intended to take photographs from the membrane, it should then be treated with a fuchsin solution in alcohol and coloured a deep red, which appears black in the photograph. The tonograph is then ready for use and only requires sufficient time to ripen for better results, as the longer the rubber is allowed to stand in tension the more homogeneous it becomes, and the more perfect will be the geometrical figures which are produced. Rubbing in circular sweeps with the finger and drumming upon it daily increases its delicacy and activity. For a given instrument the figures are exactly the same for a given tone; but the figures vary for different tensions of the membrane and for different diameters of the disc. The simplest substance to use and best to photograph is a mixture of table salt and fine emery, a few experiments being enough to show how much emery to add to make the cleanest figures. If the salt is damp, it must be placed in the oven and heated to expel the moisture. As much salt as can be put on a ten-cent piece is then put in the centre or sprinkled over the rubber membrane, and a note sung in the open end of the instrument, when at once the beautiful figure appears which is the geometric expression of that pitch. It is more interesting to sing this note through a short tube or horn into the mouth of the instrument, for by this means we can hold the tonograph level, and more readily see the figures produced. In the same tonograph different voices make the same figures, but the over-tones which model the nodal lines make more delicate tracery when sung in such a manner that their effect is not marred by bad production. The more beautiful a voice and the more perfectly employed with respect to over-tone production or harmonic richness, the more delicate and beautiful will be the picture. The picture made on this instrument is as exact as the tuning fork in determining pitch, and the pitch of any note may be at once ascertained by reference to the chart.

THE TRUTH ABOUT "DEVILS" OR PITS IN PHOTO-GRAVURE PLATES.

[Wilson's Photographic Magazine.]

Those who are interested in the photogravure process will, doubtless, recall the several articles which have appeared during the past year or two under the above or similar headings. In these articles various experts have set forth with abundant detail the cause and effect, the remedy, the character, and the appearance of the troublesome pests which harass photogravure workers in the guise of "devils." One would imagine that, after the matter had once been clearly explained, the "devils" would be cast out and all troubles cease; but the regular appearance of papers and new theories devoted to the subject seems to argue that the "devils" are still with us.

I will cite two articles on this interesting topic. The first appeared some years ago (I forgot the precise date) in the *Photographic News Almanac*. It purported to be a complete description of the photogravure process, with working details, but was largely made up of clippings and extracts from the *Photo Correspondenz, Photographische Mittarbeiter*, and Dingler's *Polytechnic Journal*. Toward the latter part of the article the compiler says: "It sometimes happens that during the etching manipulations a very interesting reaction occurs. Small star-shaped indentures are formed, which, if not retouched by the engraver, will give dark spots in the prints. These stars were supposed by some to emanate from impure copper, by others from microscopic impurities in the pigment tissue. Now it is found that the etching solution is the cause. If a fresh solution of iron is employed, the above fault will be sure to put in an appearance more or less. This shows at once the remedy."

Again, in The British Journal Photographic Almanac for last year 1896), page 826, is an article under the heading, "The Cause of 'Devils' or Pits in Photo-engraved Copper Plates." I quote:—

"E. Sanger Shepherd, in the *Journal of the Society of Arts*, writes:—

"These pits I believe to be due to particles of inferior metal left in the copper from imperfect refining, or forced into the plate mechanically during the rolling and hammering. The impurities, generally iron or zinc, are attacked much more rapidly than the copper, probably from local galvanic action, and the evil is intensified if the solution contains a large excess of free chlorine. Messrs. Hughes & Kimber, the well known firm of copper-plate manufacturers, tell me that they are obliged to reject many sheets of copper on account of these specks, technically known as 'spelter.'

"If a plate cut from the same sheet as one affected with 'devils' is examined carefully by reflected light after it has been cleaned with whiting, the spots will be seen as brighter silvery specks; and, if the plate is then held over the fumes of ammonia until the copper has acquired a decided tarnish, these specks will be still more easily recognised. Although I am unable from the nature of the trouble to state a remedy, this simple test will enable workers to avoid the trouble.

"Plates showing the silvery spots should be returned to the maker as they are quite suitable for mezzotint or engraving with the burin, but useless for our purpose."

Now, all this is nonsense—mere guess work; it sounds and looks well on paper, but, when you come right down to practical work, none of these theories will stand a practical test.

On the other hand, it is an easy matter to prove the incorrectness of these theories, and I will do so in a simple, practical way, so that any one interested in the matter may understand. We will proceed systematically, step by step, so that those who desire to experiment for themselves can do so, and, at the same time, satisfy themselves of the correctness of my assertions.

In the first place, we will take a large sheet of copper, say twenty-four by eight inches, which is suspected of being full of the impurities spoken of in the articles quoted. In fact, we will suppose that we have a very bad piece of copper (granting, of course, that the copper is to blame) because we have used part of the sheet, and the plates turned out full of holes.

I might say plainly that I do not deny that there are impurities in the copper generally bought and used for photogravure; on the contrary, I am quite willing to admit that these impurities exist to a greater or less extent in all copper; but I deny that these are the cause of "devils," either directly or indirectly.

We will now take our sheet of copper, twenty-four by eight inches, and cut it up into eight pieces, each measuring four by six inches. These eight pieces of copper, we will suppose, are cleaned and prepared precisely as if we were to make photogravure plates on them. Leaving two of these plates in the rack with a clean surface, we will take the next two and lay a very fine ground or grain on, and melt it on the plates in the usual manner. On the next two we lay a medium grain, and on the last two a very coarse grain. This gives us two sets of plates, four in each lot. It is important, before we go any further, that the reader clearly understand that these plates are divided into two lots. We will call them Lots No. 1 and No. 2. In Lot No. 1 there is one plate without any grain on, simply a clean piece of copper, a second plate with a very fine grain, a third with a medium, and a fourth with a very coarse grain. In Lot No. 2 we have four plates corresponding exactly with those of Lot No. 1.

We now put all the plates of Lot No. 1 into the etching bath, without any resist film on, simply the grained copper plates and the single ungrained one. Whether the etching bath is an old or new one makes no difference. In this experiment I simply have in mind the assertion that a new solution of iron will give holes, while one that has been used some time will not. In my own practice I would not think of using a fresh solution of iron; the action is too violent, and very difficult to control, so as to get proper gradation of tone; this makes no difference for our present purpose. We will leave the plate in the bath long enough to get

a fair amount of depth, bearing in mind that the action of the mordant is much more vigorous on the bare copper than it would be on plates coated with a resist film. We must be careful not to get too great a depth, because in that case there would be such a mass of colour all over the surface that the holes would not show, or, if they did, their appearance would be so slight as to be scarcely noticed. We therefore leave them in the bath just long enough to get a tint corresponding to the middle tones of a picture. The exact length of time cannot, of course, be given, as this depends upon several factors, for example, the strength or freshness of the iron; the temperature of the bath at the time the plates are put in, &c. Then also the plates cannot be left in the bath for the same length of time if we seek the best result. Approximately the plates may be taken out of the bath in the following order: after five minutes the plate with the finest grain can be taken out and washed; in ten minutes, the one with the medium grain; in twenty minutes, the coarse-grained plate may be taken out: and in half an hour the ungrained plate may come out.

These four plates, now etched to the proper depth, are washed, thoroughly cleaned, and dried. We will sit down and examine them, one by one, with a glass (usually anybody with half an eye can see the holes only too well when they are really present), but as I am blessed with good eyesight, and fail to discover any "star-shaped indentures," we will take the pains to examine them under the glass. The result is just the same, glass or no glass, we see plenty of pinholes, but these are of little consequence, as a photogravure plate is seldom rejected on account of these, which are probably pores in the metal.

Having failed to discover any "star-shaped holes" after a most careful examination, we set these four plates aside and turn our attention to Lot No. 2, proceeding with them as we would in the regular course of making a photogravure plate. In the first place we select a positive, preferably a portrait, for the reason that it is always difficult and troublesome to get a perfect plate of a portrait. The portrait chosen has smooth and delicate tints and a fine-graded background. Any little imperfections or spots on such a plate will stand right out and attract the eye instantly, while on a landscape they would hardly be noticed at all. Having procured a suitable positive, we proceed to make four exposures on carbon tissue, and develop them on the four copper plates previously prepared. The reader is supposed to be familiar with the operations to be gone through before the plate is ready for the etching, and also the etching of a photogravure plate itself, so I will pass over that part of it, and come to the stage where the plates have been cleaned and are ready for examination. We first take up the ungrained plate and examine it carefully; we find that, on account of the absence of grain, there is not much of anything on the plate, simply a weak impression of the picture. That, however, is of little consequence; what we are looking for are the "star-shaped indentures." We do not find one. We take up the plate with the finest grain, and the result is not quite so satisfactory; there seem to be indications of these holes, but they are so slight as to be hardly noticeable, unless we were looking for them. This plate we will put aside, and take up the medium-grained plate. To our surprise there is quite a sprinkling of holes on this one, and they are quite large enough to be plainly seen. The experiment becomes interesting, and, putting this plate also aside, we take up our fourth and last plate; this is the one with a very heavy grain. Surprise does not express our feelings as, on examination, we find it to be full of holes, varying in size from the almost invisible to some almost an eighth of an inch in diameter. Their peculiar shape attracts our attention more than anything else. They are not simple holes in the copper with sharp clean edges, but star-shaped, deep in the centre, with arms running out in all directions; the deeper and larger the holes, the longer and thicker the arms. We also notice that the arms are thickest near the edge of the holes, and taper away to nothing. Another thing that should be noticed is that these arms do not run straight out from the centre, but zigzag; in short, they resemble a "devil" fish, from which they probably got their name.

There is one more point I would like to call attention to, and that is, the complete absence of these defects in the high lights and in the deepest blacks. There are some in the tone next to the deep shadows; but they are small, and the surrounding colour tends to hide them, so that a plate is never rejected on their account. It is always in the middle tones of the picture that the spots are most pronounced, and in case of a graded background they are noticeably larger toward the darker portions of it, and run lighter toward the high lights, where they are lost to sight. I do not mean a uniform gradation, for there will be small spots in the darks, but the largest ones are always found in the darker middle tones.

The best place for a plate of this kind is in the waste box; no amount of retouching will make it good. There are two ways it might be done, supposing another plate was not obtainable. One is to punch each hole up from the back of the plate, and the other is to roulette the plate in the portions where the holes are most prominent, so as to give more depth of colour, and consequently hide the defects. These are both impractical. To punch up the holes would be very tedious, and in the end unsatisfactory. To roulette more colour in portions of the picture would change its colour values and harmony, and the effect would be bad.

We are now ready to take up and argue why these holes are not due to any of the causes described in the articles I have quoted.

In the first place, the blame cannot be imputed to the copper, because we had eight pieces all taken from the same sheet. The only difference in the plates before we got through was the graining; some had fine, some coarse grain, and some no grain at all; half had the resist film on, and the other four had only the grain; but nobody will claim that this had anything to do with the purity or impurity of the copper. If the copper was at fault, why and how was it possible for any discrimination? We should certainly have holes in all the plates, particularly in those that had no resist on them, because there the acid had more freedom in its action. If the fault lay in zinc spots in the copper, I do not believe there would be this great difference, because, as far as I know, the action of perchloride of iron on zinc and copper is about equal; if anything, I think it it is more vigorous on copper, although I never tested it. This I know, that perchloride of iron acts very slowly on metallic iron; its tendency is to precipitate it. For instance, if you take a lot of iron filings and pour perchloride of iron on them, after a short time there will only be the clear acid left, so that, in case of iron specks in the copper, we should have little hills in the etched photogravure plate instead of holes, which would give light rather than dark spots on the print, with the advantage that they could be easily retouched.

For the same reason, if the trouble is with the etching bath, why should not these holes make their appearance in all the plates more or less? The same argument holds good for the grain and resist as causes of "devils." Nobody has yet claimed that the grain has anything to do with the trouble, so we will drop that for the present and consider the carbon resist film for a moment.

The reader will remember that there were only two plates that showed holes, and these two had the film on them. We might therefore be led to think that, after all, it must be here where the trouble is to be looked for. But you must not forget that there were also two other plates that had the resist film on them, and they showed no holes. If there were microscopic impurities in the tissue, these holes should, in the first place, make their appearance on all the plates that had the film on, and, in the second place, there should be no discrimination for a certain locality on the plate where they should appear. In such a case they should not only show in the middle tones, but also in the high lights, which they never do. There must be some reason for this discrimination, as the mordant has the same chance to act equally on all portions of the film from the time that the plate is covered by the etching bath. Neither will anybody claim that the mere fact of the gelatine film being present on the surface of the plate while in the etching bath would cause any local galvanic action.

Having now dwelt upon the whys and wherefores, probably much too long, I will explain as briefly as possible the real cause of "devils" and pits in photogravure plates.

The fault lies between the grain and the film—they are both to blame. If you use a fine grain, and are absolutely sure that no particles of foreign matter get on the plate during the graining and transferring of the print to the plate (as, for instance, little specks of grit or dirt of any kind, such as sand, but mostly larger particles of the grain), you can be sure that you will get a plate without holes; but, as this is next to impossible, we will have to "grin and bear it," and buy another plate, possibly with better result, possibly worse. In this case the proverb, "Try and try again," comes in handy.

This is the explanation of it. The exposed tissue is transferred to the copper plate, and is developed, washed, and dried thereon. The trouble begins when the plate begins to dry. It need not be any particular kind of dirt or grit that has gotten between the plate and the film; but, to better illustrate what I mean, we will suppose that a grain of sand has gotten there. If, after the plate was dry, there was any way of examining it, we would find that, instead of the film drying close down on the plate, the little grain of sand had lifted it up, leaving a small cell of air all round itself. When the film finally got thoroughly dry, it pulled together again as tight as the grain of sand would allow, but still left an air space round the sand grain (the film being tough and leathery, it was not punctured), and also left this peculiar, drawn-up appearance all around the edges, resembling the familiar reticulation on gelatine dry plates.

If you want to try the same thing on a larger scale, take a sheet of gelatine and squeegee it on to a smooth surface with a lump of some kind between the surface and the gelatine. It will be made perfectly clear to you. You will never find that the gelatine stretches tight and smooth like a drum head, but always drawn up in little ridges. These ridges are always larger toward the substance which causes them.

As soon as the mordant has penetrated the film, and got into these air holes, the action is probably much more intense there than anywhere else, because we get a greater amount of fresh acid in contact with the copper. The air itself may also have a tendency to favour rapid action.

Right here you may ask yourself why we do not get these holes in the shadows and high lights of the picture As far as the blacks of the picture are concerned, it is impossible to get the spots there, because, in development, the gelatine is all washed away, leaving the bare copper. Not so with the high lights; the conditions here are very favourable for the production of spots, but you must remember that the high lights are the very last to be attacked. The mordant scarcely has time to get

through the lighter tints, and does not get through at all in the very highest lights before the plate is taken out and washed. Now, if, instead of taking out the plate at the proper time, we should leave it in the bath long enough to get quite a heavy tint where the lighter shades and high lights should be, we would find that there would be just as many holes there as we found in the middle tones, while those in the middle tones would be lost sight of to a great extent, being etched deeper. The conclusion is that, if you use a fine enough grain, and are careful to get no dirt on your plate, you will have no "devils." JOHN PETERSON.

A HISTORY OF PHOTOGRAPHIC PRICES.

IN considering the economic position of any industry, that is, the average profits, the rate of wages, the selling price of its produce, it greatly helps to a complete survey if we have at our disposal tabular accounts, extending over a number of years, showing the fluctuations that have occurred in profits, wages, and prices. Such tables enable the commercial man to easily ascertain the present condition of trade as compared with former times. By contrasting different periods and the relations that held between profits, prices, and wages, he knows exactly if his profits are as high as they should be relative to prices and wages.

Until within recent years, very little had been done to collect these statistics, although now we have various governmental departments collecting industrial figures of all kinds. These, however, only deal with things of national importance and the larger industries; photography, apart from the census, and imports and exports, is not considered, consequently there exists no record either of photographic prices, wages, or profits. It is impossible to obtain in print, easily accessible, any reliable information concerning the price of photographs, the rate of wages, the percentage of profits on capital, say in 1850, 1860, and 1870. This is not remarkable, for such information is very difficult to obtain at the present time, let alone twenty to thirty years back; it seldom gets into print, and only exists in the minds of men who are not willing to divulge what they consider private matters. Of the three, the standard of prices is most easily obtained, the rate of wages less, and the percentage of profits least. Now, if we can secure a complete account of the fluctuations in prices, we are able to infer with some certainty what was the rate of wages and profits, these bearing a fixed relation to prices. Economists therefore make it their primary work to secure a record of prices, next wages, disregarding profits, and deducing them from the relation that held between prices and wages.

Assuming we possessed a complete record of the average price of a dozen portraits and the wages of assistants for each year since 1840, we should then be in a position to infer with some accuracy which were the prosperous years, and the position of the trade at the present day. To find the rate of wages for any given year is not practical without the co-operation of many photographers, since it means examining the account books, supposing they have them, of long-established houses of business. The advertisement pages of the old journals might be searched, but possibly these do not exist, at least they are not at my disposal. Failing a rate of wages and profits, we are left with prices only; a bare account of prices will be found of use, but its value will be much increased by comparing with it the fluctuations in price of some article that does not directly determine the price of photographs, yet enters largely into their composition as raw material. No commodity exactly fulfils this condition; though silver does so in a degree, it enters into the price of material both in negative and in print, and necessarily in so much the price of silver and photographs will bear a constant relation. For instance, in the estimate of annual expenditure given in the JOURNAL of April 16, the outlay on silver nitrate, plates, and paper is about ten per cent. Assuming the cost of raw silver as five per cent. and then, if silver depreciates and what was previously worth 5*l.* is now valued at only 3*l.*, prices and wages remaining the same, profits will go up two per cent. The usual result, however, will be that the reduction is spread over the three, and prices, wages, and profits fall. In this way, in so far as silver enters into cost of production, it will serve the purpose of a comparative standard. It follows that, the higher the multiple of the price of an ounce of silver contained in the price of a dozen portraits, the higher will be relative prices. To illustrate this, in 1867 silver was 5*s.* an ounce, a dozen *cartes* could be purchased for 3*s.* 6*d.*; at the present time silver is 2*s.* 4*d.* an ounce, and a dozen *cartes* can be had for 2*s.* 6*d.*; the relation between price of silver and price of *cartes* is thus 60 to 42, and 28 to 30 respectively; hence, in relation to silver, it is more profitable to produce 12 *cartes* for 2*s.* 6*d.* now than it was to produce them at 3*s.* 6*d.* in 1867.

This kind of argument must not be pushed too far, silver being but five per cent. in cost of production, yet it is possible, by estimating every article that enters into the cost of production by the silver standard, to arrive at the percentage of profits on capital at any stated time. Supposing silver entered into the composition of photographs fifty per cent., it is obvious the slightest alteration in its market value would at once affect photographic prices.

In the table below it will be seen that the price of silver is included, not that much of real use can be gathered from its inclusion, but because it is an element in determining prices, and its market value for any year is available. Mounts, rent, wages, price of material would also serve, could the market rates for the years named be given.

PRICES.

Date.	C.-D.-V.	Cabinet.	Process.	Price. £ s. d.	Silver.
1839	...	...	Daguerreotype.	...	59
1845	1	...	,,	1 1 0	,,
1850	1	...	,,	0 10 6	61
1854	1	...	,,	2 10 0	,,
,,	...	1	,,	4 0 0	,,
1855	1	...	Collodion.	0 2 6	,,
,,	...	Whole-plate.	Salted paper.	3 10 0	,,
,,	...	,,	Albumen.	0 10 6	,,
,,	1	,,	,,	0 2 6	,,
,,	...	1 cabinet.	,,	0 5 0	,,
1860	12	...	,,	0 12 0	60
,,	12	...	,,	2 2 0	,,
1864	20	...	,,	1 0 0	,,
,,	8	...	,,	1 0 0	,,
,,	25	...	,,	1 0 0	,,
1867	12	...	,,	0 3 6	,,
,,	1	...	,,	0 1 0	,,
,,	1	...	,,	0 2 6	,,
,,	6	...	,,	0 5 0	,,
,,	24	...	,,	1 1 0	,,
,,	12	...	,,	1 1 0	,,
,,	40	...	,,	2 2 0	,,
,,	6	...	,,	1 1 0	,,
,,	6	...	,,	1 11 6	,,
1873	12	...	,,	1 0 0	56
1876	12	...	,,	0 10 0	,,
,,	...	12	,,	1 0 0	,,
,,	12	...	,,	0 5 0	,,
1878	12	...	,,	0 10 0	,,
,,	12	...	,,	0 6 0	,,
,,	12	...	,,	1 0 0	,,
1880	12	...	,,	0 7 6	51
,,	...	12	,,	0 18 0	,,
1882	...	12	,,	2 2 0	,,
1885	...	12	,,	0 18 0	45
1890	...	12	Platinum.	1 10 0	47
,,	...	12	Albumen.	1 1 0	,,
,,	12	...	,,	0 12 6	,,
1892	3	1	,,	0 1 0	39
,,	...	3	,,	0 2 0	,,
,,	12	...	,,	0 2 6	,,
,,	12	1	,,	0 3 0	,,
1893	...	6	,,	1 11 6	35
1894	...	12	,,	0 15 6	29
,,	...	12	,,	0 12 6	,,
,,	...	12	,,	2 2 0	,,
1897	12	...	,,	0 2 6	28
,,	...	12	,,	0 5 0	,,
,,	...	12	Platinum.	0 12 6	,,
,,	...	12	Albumen.	0 15 0	,,
,,	...	12	,,	1 1 0	,,
,,	12	...	,,	0 10 6	,,

The above table is far from complete; a final account should give the highest, average, and lowest price in every year, preferably of a dozen *cartes* and cabinets, these being the chief articles of commerce. To make the table easy to manipulate, the prices might be averaged over five years, the result showing the variations in prices from 1839 until 1897.

Incomplete as the table is, several interesting points come out; until 1864 prices seem to have been very high, 3*l.* 10*s.* for one whole-plate is a sum that will make present-day photographers long for the return of such rosy times. Adam Salomon is said to have charged as much as 4*l.* for one 10×8 albumen print, which is perhaps the high-water mark of photographic prices. Given a man as gifted as the second Adam, I believe he might still obtain these high prices, on one condition, that after printing a copy he smashed the negative, refusing reproduction, thus giving a fancy value to the work.

In 1867 low prices commenced, one carte for 1*s.*, or twelve for 3*s.* 6*d.*, yet even then high prices still ruled, and 1*l.* 11*s.* 6*d.* for six *cartes* is not a low price. By 1878 these prices were a thing of the golden past, 1*l.* being then the highest sum paid for twelve *cartes*, the average being from 6*s.* to 10*s.* My data for *cartes*, since 1878, is so meagre as to be of little value. Since 1880 cabinets appear to have gravitated to the prices that *cartes* were previously. In 1880 the average price for cabinets was from 18*s.* to 20*s.*, though the best firms obtained 2*l.* 2*s.*, and probably more for special work.

Since then average prices have slowly decreased, and 1897 sees the

v-water mark. The average price for cabinets is now about 15*s.*, or m 12*s.* 6*d.* to 18*s.*, instead of 18*s.* to 1*l.*, as in 1880. Of course, the st firms still maintain their prices; but these are exceptional, and it is e average price that determines the position of the bulk of photo-aphers. Even in 1893, 1*l.* 11*s.* 6*d.* was charged for six cabinets, which up to the old standard before 1860. Such prices as 2*s.* 6*d.* for twelve *rtes*, and 5*s.* for twelve cabinets, have not been reached in former years. 1867, twelve *cartes* could be had for 3*s.* 6*d.*, the highest price at the ne being 1*l.* 11*s.* 6*d.* for six *cartes*. Evidently, cheap rates do not iously interfere with high prices. Neither did these low prices, thirty ars ago, cause any sudden fall in average rates, for ten years later 10*s.* s still the average price, and 1*l.* the highest price for twelve *cartes*. ven at the present time, when twelve *cartes* are obtainable for 2*s.* 6*d.*, erage charges do not fall to this level, and 6*s.* to 10*s.* is still the average te. This indicates that low prices are not really profitable, and there-re have no effect in reducing the average prices. Thirty years ago ices did not fall to 3*s.* 6*d.*, and presumably they will not drop to 2*s.* 6*d.* the future.

Generally, the table shows that the fall in prices has been steady since 60, the difference being about twenty-five per cent. During the same riod silver has depreciated more than fifty per cent. Photographers ve thus gained on this item of expenditure.

Another point the table brings out is that prices are not fixed by com-tition, but depend more on the skill and reputation of the photo-apher. Adam Salomon charged 4*l.* for a single 10 × 8 because only mself could produce the work. Throughout the whole photographic riod there have been men obtaining prices quite independent of others. hotographic prices are not fixed by the market value of the produce, it reside in the skill of the photographer; in no other way can we count for the existence in one market of prices so diverse as 5*s.* and . 2*s.* for an article which varies but little in cost of production.

JOHN A. RANDALL.

INTERIOR ARCHITECTURAL WORK.

FEW years ago, when the number of camera-makers was very limited, nd the names of lens-manufacturers even less, the photographer had er force to use a camera for architectural work which was, so far as my emory serves, undoubtedly excellent for the purpose, the fact being, I ppose, that apparatus was not made so much for the tourist and the field" as for the "stay-at-home" brigade. I have in mind what is ven now by far the best all-round camera a man can possess, viz., the quare, parallel bellows, long-focus camera, made with swing back, and ng horizontal and vertical fronts; a camera which, not *necessarily* onderous, though that was often the case, had in it the stamina of ears. We were, too, obliged almost, to use most excellent lenses. I hould not like to say a word detrimental to some of the very good and heap optical goods of the present day; but, twenty years or so ago, if ne wanted to do the best architectural work, one turned instinctively to oss and Dallmeyer, or Grubb. Those were the days, when, if a man ossessed a lens of exceptional power, it was treated as a priceless ossession, only to be shown to the few, and never to be allowed out of and.

This is a cheap age, but I do not observe any "slump" in apparatus f the finest quality and workmanship. I don't quite see why a camera f even modest dimensions should cost as much as would purchase a ecent suite of furniture, but such is a fact; while as to hand cameras, nd suchlike small fry, some of them would, put to their cost in specie, set up" many a young couple in housekeeping!

It is essential that a camera intended for the special work indicated by he heading of this article should have a very free range of front and a wing back, also that the bellows fold in such a way as to form no bstruction to a full view of the subject upon the dry plate and screen.

Wide-angle, rectilinear lenses, of course, are essential, and of these othing need be said. Some testing of them should be done prior to sing such for serious work. Few lenses will stand what I may term a eavy strain in the way of rising front. Some can be humoured, so to peak, and work fairly well with the rising front and a compensating wing back. Lenses, even by the most illustrious makers, are not lways uniform. I have had a six-inch P.S lens which would take splendidly defined negative 15 × 8, while another requires considerable ricking to cover 10 × 8; but, as these were sold as whole-plate lenses, I annot honestly complain. A third lens, a rapid rectilinear, to cover 5 × 12, will do this fairly well, but no more; while a fourth, of only ten-nch focus, has been used repeatedly for plates 20 × 16. Wide-angle recti-inears, in particular, take a lot of studying; get fairly on a level with our subject, and they give perfect definition; as a rule, they will not ear great strain. I invariably use my wide-angle rectilinears the "wrong way about;" that is to say, with the front of lens facing the plate; I get, r fancy I get, better illumination and definition, and this is not a fad f mine, for I learnt the habit of a very clever and experienced worker.

Backed plates, I need hardly say, are indispensable, and, having tried, believe, everything that has been recommended as a backing, I can only nce again suggest stained collodion and matt varnish, *deeply* stained ith magenta, as the best by far. This was used and recommended by he writer some years ago.

This excellent "backing up" of a good fast plate, combined with a very full exposure, and the main difficulties in connexion with successful interior work disappear.

Ingenuity has been taxed, over-taxed, in my opinion, with regard to tripod stands. Of all the scores of stands in the market, not one-half are rigid when put up, and as for portability, and lightness, and appearance, well, I have never met with a stand equal in all these desirabilities to what I used to buy from our friends in Hatton-garden under the name of the Maudsley.

But the ideal stand for indoor architectural work has yet to be invented. How often one wishes to cut off more of the obnoxious, dark, and uninteresting foreground, the unsightly pews or chairs! How are we to reach some special bit of carved work, or undoubtedly improve the effect with a stand whose range extends only to five feet six? When photographing the statues in a lovely altar screen, I felt these troubles to an amazing extent, finally using a pair of very high steps, which, however well adapted for ordinary domestic and business purposes, seemed much too rocky for delicate work with the camera. I have known men to have special stepladders made for this work, but I am confident something better could be done with a good tripod as a basis. A stand is always useful if the legs can be shortened or lengthened as occasion requires. Now and then I have thought how useful it would be if one leg had a sucker at the end, or a hook, or if it would go round a corner and take a firm grip of something solid, but we can't have everything we want. Well, at all events, we can have a firm stand, not too light, with sliding legs, and a good broad top. With this, something can be done, and I have surmounted some difficulties many a time with such a stand as this, improved in a way briefly to be described.

The central aperture in the tripod top, through which the camera screw usually passes, is enlarged, and four inches of brass tubing inserted and fixed therein by a collar which is screwed to the top, care being taken to have the *tube*, when the top is levelled, quite true in the vertical line. Now at the end of a long brass rod or tube, say four feet in length, and which accurately fits the larger tube already screwed to the camera top, is fitted by means of brass collar, &c., and adjusted, a *second* "top" upon which, with the usual screw, is fixed the camera. It follows therefore, if reasonable care is exercised in making and fitting this small alteration, that we get an extended elevation of about three feet at least, which is very useful, not only to get rid of objectionable foreground, but also at times to enable one to rise above a brother conventioner who is sure to be in the very spot you would have selected for your own view. My own tripod is fitted with two tops measuring 8 × 6, over and above the usual tripod head, the two forming together, when the camera is lowered, a shallow box, neatly fitted and hooked. I tried various cross guide struts, &c., at the sides to get increased *steadiness* with the elevator, but have found, for a whole-plate camera, sufficient steadiness is got by simply using good cord elastic stretched from opposite corners between the upper and lower platforms; the rod is adjusted at various heights simply by insertion of a brass pin, several holes being drilled in the rod for the purpose. Very great steadiness and rigidity is got by the use of strong cord; elastic by preference, the camera can be elevated and "stayed" with great facility. In using this stand, I focus, of course, at the usual height from the ground, not, however, using the rising front to quite the same extent, set the shutter or exposing apparatus, draw the slide, adjust the focussing cloth, then elevate the camera. A *firm* tripod is essential, and the more heavily it is weighted, within reasonable limits, the better, prayer-books and hassocks being often used for this purpose, suspended underneath. Tripod legs are prevented from slipping, not only by using rubber tips, but, if small brass rings are put in for the purpose, are best "stayed" with good cord. I invariably include in my outfit a supply of string, also some of those small brass hooks with sharp screws, which can be pushed in anywhere, and make a secure fastening.

Shutters actuated by pneumatic release are, of course, desirable for uncovering the lens after elevation of the apparatus. It is easy enough to switch off an easy-fitting lens cap, by means of a piece of thin string, with the camera eight feet above the level, but how to put it on again, when the exposure is ended, is the question, or how to shield the lens sufficiently while lowering the apparatus; something can be done with the focussing cloth, I know, but a proper shutter is most reliable. For the purpose, one of a very simple kind, roller-blind pattern will do, preferably fixed behind the lens and well above the centre of gravity; a roller-blind shutter is the simplest thing to make, being a band of leather working over a small roller fixed in a thin wood case; the latter is made three times the length and a little wider than the diameter of the lens hood, and is, of course, pierced back and front to the full extent of the lens surface; the leather band has two apertures of equal size cut in it, one working past the other, and, when these are directly opposite, the lens should be at the fullest opening. Adjust a simple arrangement of this kind, see that it works freely, and by using two long cords the uncovering and covering of the lens is done with ease. A shutter, such as Place's, could be fitted, but with pneumatic arrangements you appear to want two separate balls and tubes, one to open and the other to close the lens. I am a firm believer in long exposures for interior work—and pneumatic arrangements, such, for instance, as fitted to flap shutters, are not nearly perfect enough for prolonged exposures—as I am convinced that a deal of "halation" is thereby, combined with the use of a richly coated and well-backed plate, avoided.

J. P. NOTT

NOBEL'S METHOD OF OBTAINING PHOTOGRAPHIC MAPS AND EARTH OR GROUND MEASUREMENTS.

THE following is a description of the invention as given by its author.

I provide a small balloon, a rocket, a projectile, or a missile of any construction, suitable to be sent to a sufficient height, with a photographic camera, which, except when carried by a captive balloon or equivalent aerial support, is provided with a parachute, that, at the suitable moment, as hereinafter explained, is automatically detached from the vehicle or missile carrying it upwards, and gently descends, carrying with it the said camera. A suitable automatic shutter arrangement admits and cuts off, at the right moment, as hereinafter described, the light to the lens.

If a small captive balloon or a kite serves as the vehicle for carrying the camera, the apparatus consists only of the photographic camera and the automatic shutter arrangement, which, at the proper time, admits and shuts off the light.

But, when a rocket or a projectile is used to carry the camera, a parachute, arranged in the same manner as those now in use for parachute light balls, is employed to bear up the camera in its descent when detached from the rocket.

For disconnecting, at the right moment, the parachute with said camera from the rocket or projectile that carries it, a time action is provided, it being regulated by a time fuse, as is also the opening and closing of the camera shutter. The parachute, when opened, ensures the gentle descent of the falling camera, and the time action for regulating the opening and closing of the shutter operates as soon as the descending camera and parachute have practically ceased to vacillate.

In order to obtain a sharp and clear image, it is necessary that the exposure shall take place when the camera is, as far as practically possible, free from side motions, and especially from rotary motion, which would tend to confuse distant objects received on the sensitised plate or film. In order to prevent, as much as possible, the unavoidably remaining motion from clouding the image, the exposure should be as short as practicable.

The negative image thus obtained is developed in the usual way, and positive transparent images taken from it. I then proceed to enlarge such positive image by projecting it, with suitable lenses or an enlarging camera, on a wall or on a prepared surface; and, in order to make such enlarged pictures, serve as maps, and permit of telemetric measurements being readily made, I project said enlarged images on sensitised surfaces, as films, plates, or paper, which have been previously so ruled, or square ruled, as to represent, by the distance between the lines, or by the size of the squares, equal distances or surfaces of real ground on the enlarged map. These distances or measurements may, however, require corrections for the difference in level of the photographed ground.

It is clear that, in order to get accurate measurements or to enlarge the image to a certain scale, either the height at which the exposure is made, or else the distance between two places showing in the map, must be accurately known, the latter being by far the most practicable. With the precaution, the surface which is to receive the enlarged image may be previously prepared by ruling or cross ruling to any desired scale, the image being enlarged to suit this scale. Thus a large extent of ground can be mapped within a very short time.

This method can also be used for height measurements by taking successive images at different heights, when the difference in the angles of vision will furnish data for computing the heights of different objects showing on the maps.

The choice of vehicle for carrying the photographic camera upwards will depend on the objects to be mapped in, the state of the atmosphere, and sundry other circumstances, such as the means most ready to hand, &c. The simplest arrangement is a small captive balloon, as it allows an easy and accurate adjustment of the height, and because no parachute, and no arrangement for detaching the camera, is needed. But, in windy weather, a captive balloon, whatever be its form, is apt to be unsteady, and cause the camera to vacillate, or to turn upon its axis, thus clouding the image received on to the sensitised surface.

Besides this disadvantage, the retaining cord will always show, and disfigure the picture. In most cases, therefore, a rocket or a projectile will be found more suitable.

A rocket, if accurately charged and well balanced, can be made to ascend practically to a determined height, and in a regular trajectory. A projectile shot straight upwards from a mortar, has a trajectory still more under control, and can be sent up to a great height, closely regulated by the charge in the mortar, such height being capable of easy computation by observing the time between the firing of the projectile and its striking the ground.

The rocket, or the projectile, as the case may be, is provided with a photographic camera connected to a parachute. These appliances, by means of a time fuse, or other time action in connexion with suitable mechanical or other arrangement, may be detached, at a calculated moment, from the rocket or projectile, and allowed to fall to earth.

A second time fuse, or time action, in connexion with a suitable mechanical (or other) contrivance, will then, at the proper moment, effect a momentary exposure of the sensitised film, the parachute with the camera gently descending with the image, which subsequently is to be developed.

Fig. 1 of the accompanying drawings illustrates the mode of fitting a rocket with a camera and with a parachute, and figs. 2 and 3 show, in plan and sectional elevation, details of the means for opening and closing, at the right moment, the camera shutter.

a is the rocket shell, to the bottom of which is fitted a plug, *b*, having a central hole communicating with a conical hollow or space, *c*, in the driving composition, *d*, inserted in and filling the case. The gases generated by the combustion of the driving composition escape, as usual, from the bottom of the shell. *e* is a block which fits the rocket shell gas-tight, and is pierced at the centre with a fine hole leading to a recess in the upper face of the block, which recess is charged with gun-cotton, for the purpose to be presently explained. Seated on this block, and fitting tightly to the rocket shell, is a tube, *f*, containing the camera. This tube is closed at bottom by a removable plug, *g*, which serves to confine the gun-cotton in the recess of the block, *e*. On the explosion of the gun-cotton, the plug, *g*, receives an impulse from the ignited charge sufficient to drive out the tube, *f*, and detach it from the rocket shell. This plug, *g*, is open at the centre to receive a lens, *h*, which is covered by a spring shutter, *i*. In the tube, *f*, above the lens, is fitted a cross partition for carrying a sensitive film, *k*, and above the partition is a chamber for containing a folded parachute, *l*, which is made fast to the partition by a short line or cord.

The parachute chamber is closed at top by a hollow conical cap, *m*, containing an explosive, and underlying this cone, which fits tightly

Fig 2

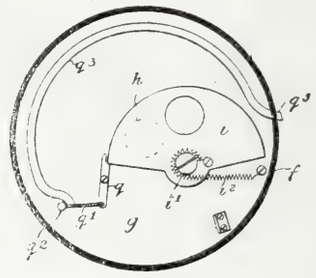


Fig. 3.

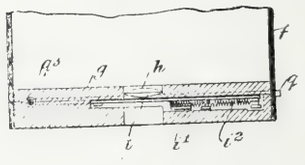
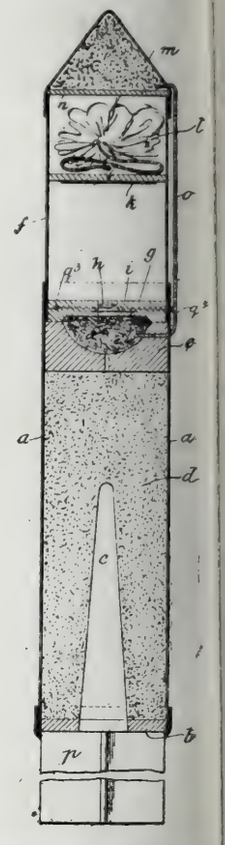


Fig. 1



upon the tube, *f*, is a loose disc, *n*, which serves to protect the parachute from the fire of the explosive in the cap, *m*.

The parachute and cap are temporarily connected by a cord, which serves to draw out the parachute from its chamber, when the cap charge is exploded.

Leading down from the cap, *m*, to the chamber in the plug, *e*, or, it may be, to the driving charge, *d*, is a time fuse, *o*, which, when the gun-cotton in the chamber of the plug, *e*, or the driving charge, *d*, is fired, conducts the fire to the explosive in the cap, *m*, and, igniting it at the proper moment, causes it to throw off the cap and disc, and free the parachute, which, expanding, will support the camera in the air, and allow it to fall gently to the ground.

The shutter, *i*, fitted to the plug, *g*, is provided with a time action, and suitable mechanical contrivance for operating it for producing instantaneous exposure, after the manner of the "snap" cameras.

This will be understood by reference to figs. 2 and 3, where *i* is the shutter (which is shown in fig. 2 in its set or starting position) pivoted at i^1 on the plug, *g*, carrying the lens, *h*. The shutter, *i*, is segment-shaped, and pierced with a hole, which is capable of being brought into coincidence with the central opening in the plug, *g*, containing the lens, *h*, when acting under the impelling force of a spring, i^2.

q is a lever catch, pivoted on the plug *g*, and designed to bear against the edge of the segment-shaped shutter, and enable it to resist the

essure of the spring, i^2. To this end, the tail of the lever, q, is held st by a thread of gun-cotton, q^1, attached to a stud, q^2. Connected ith this cord is a time fuse, q^3, which is led along the plug, g, to meet ıe external fuse, o, before mentioned.

It will now be understood that, when the rocket is fired, and the ıternal fuse, o, is consequently ignited, the time fuse, q^3, will, as the ıcket ascends, take fire, and will, at the proper moment, ensure the estruction of the gun-cotton thread, q^1. This secures the instant lease of the shutter, i, which, under the impulse of its spring, i^1, ings the opening in the shutter into momentary coincidence with the ns, h, and ensures the reception on to the sensitive plate, k (at the roper moment), of the underlying picture.

p is a pair of cross wings that may be used instead of the ordinary ooden rod for steering and balancing the rocket.

On firing such rocket after the driving compositition, d, is consumed ıe gun-cotton is ignited through the central hole in the plug, e, and jects the camera. Simultaneously, or nearly so, by the fuse, o, the harge in the cap, m, is fired, thereby throwing off the cap and developing ıe parachute. After a few moments, sufficient to allow the camera to ttain a steady descending motion, the shutter, i, by the fuse or time ction before mentioned operating it, is opened and shut, giving a ıomentary exposure to the sensitised surface, k. After this action, the amera descends gently, is picked up, and the picture is developed, when ; is ready to be utilised as described.

Our Editorial Table.

Catalogue Received.

David Allan, 157, Whitfield-street, W.

Mr. Allan's catalogue extends to 130 pages, and contains over 200 illustrations. The goods, it is said, are English-made, and their variety is great, cameras (stand and hand), stands, dark-room appliances (lamps being especially numerous), washers, sinks, flash lamps, &c., being among the chief items.

Photo Pictures in East Anglia.

By Payne Jennings. Published at The Studio, Art Photo Works, Ashtead, Surrey.

In the photographic sense, Mr. Payne Jennings has East Anglia at his fingers' ends, and there is little doubt that his many years' work in this part of the country has materially helped to open it up to the tourist, the holiday-maker, and the lover of the picturesque. The present beautiful little book, which is issued under the auspices of that enlightened corporation, the Great Eastern Railway Company, contains half-tone reproductions of about one hundred of Mr. Jennings' photographs made in the country lying to the east of an imaginary line drawn between Waltham Abbey and York—cathedrals, churches, old-world towns and villages, characteristic scenes, and architecture, alike being shown. The book is extremely well printed, and the blocks show up in a manner which is little short of perfect. It is entirely a charming production, the usefulness of which is enhanced by the excellent descriptive letterpress of Miss Annie Berlyn.

Photo-aquatint, or the Gum-bichromate Process.

By Alfred Maskell and Robert Demachy. 55 pp. Price 1s. London: Hazell Watson, & Viney, 1, Creed-lane, E.C.

In Chapters III. and IV. the authors of this little treatise enter with great minuteness into the details of the bichromated gum (erroneously styled "photo-aquatint," we submit) process of photographic printing. The materials used and the coating, exposure, and development of the sensitive mixture are so clearly and fully discussed that the photographer attempting the process for the first time would assuredly find the instructions given a most intelligible guide. The process, as the authors point out, is essentially one which gives scope for the play of individuality of treatment, and therefore it appeals to the limited few who have the faculty of making a printing method respond to their own ideas of what constitutes a "pictorial" result. The fifth chapter of the book tells of the manipulation of exposed Artigue paper, but adds nothing to our knowledge of how this mysterious surface is prepared. The little book, as a whole, is so distinctly good and useful that the authors could well afford to have omitted Chapters I. and VI. These read very like expanded "Forewords" to the Salon catalogue, and are as full of contentious matter as an egg is of meat. The spectacle of three or four amiable gentlemen deciding for themselves and the rest of the world what constitutes pictorial photography irresistibly suggests the really less comic episode of the three tailors of Tooley-street. Writing of the medal system, the authors say: "It is beginning to be understood that visitors to exhibitions are really not in the least interested in the opinion of two or three gentlemen and the laurels they may bestow on a certain number of exhibits." If for the last half of the sentence we substitute the words, "and what *they* consider pictorial photography," we probably do not misrepresent the real state of the case with regard to the attitude of exhibition-goers towards the matter in question. But we have only left ourselves space to reiterate our good opinion of the practical parts of the book.

The New Era in Lens Construction.

Leicester and London: Taylor, Taylor, & Hobson.

This little pamphlet has several photographic reproductions of tests made to determine the anastigmatic and flat-field properties of the Cooke lens. Messrs. Taylor say that it is "not designed for the great mass of photographers, because, though it is brief, it explains more than many photographers will be troubled to understand. But we expect that some of the best workers will be glad to have it." To the latter class the pamphlet will undoubtedly prove interesting.

"God Save the Queen!"

Illustrated by W. Theodore Parkes. London: Simpkin, Marshall, & Co. Price 1s.

Mr. Parkes, whose artistic gifts are of a high order, has reproduced the original score of the national anthem in album form, illustrating it page by page with the Royal Arms, national, military, and naval flags, as well as those of yacht clubs, the colonies; medals, &c. Each page of the music, of which there are ten, is therefore ornamented in a unique and effective manner. The work has been executed with rare artistic skill, and is beautifully printed. As a souvenir of the Diamond Jubilee it is at once refined and uncommon, and deserves to find a place in every home.

Mawson & Swan's Photographic Chemicals.

Mawson & Swan, Soho-square and Newcastle-on-Tyne.

The well-known house of Mawson & Swan have deservedly won a great reputation for the excellence of their various photographic preparations, and especially of any chemical that bears their brand may it be said that it is a guarantee of purity. We have just been the recipients of some samples of their photographic chemicals which fully maintain the firm's reputation. These include a varnish for plates and films, which dries rapidly and bright, and Antalo, a quick-drying backing mixture. This is applied with a brush or sponge, and is readily removed by means of the sponge, dampened. This latter point is a great convenience. We wish that all the hypo we handled was of the same cleanness and purity as that in the tin of crystals here sent us. This salt is specially prepared for photographic use, and is also sent out in cartridge form for ready solution as may be desired, for prints or negatives. Other samples include sodium sulphite, oxalate of potash, and potass-metabisulphite, this last owing its introduction to photographic use to Messrs. Mawson & Swan, all of whose chemicals may be employed with the pleasant conviction that they are carefully selected and prepared for photographic work. We shall take an early opportunity of testing the Mawson & Swan "orthochromatised" plates, some of which have also been sent us.

The *Yarmouth Independent* has issued a local souvenir of the Queen's Diamond Jubilee, entitled *Pictures of Old Yarmouth*. Interspersed throughout the descriptive reading matter are numerous phototypic reproductions of old prints and pictures depicting Yarmouth as it must have appeared at or about the time of the accession of Her Majesty. Portraits of the past and present mayors and vicars are also given. Convention visitors will find this well-produced souvenir of extreme interest. It is published by the Free Press Newspaper Company, Great Yarmouth, price three pence.

Jahrbuch für Photographie und Reproductionstechnik. 1897.

Wilhelm Knapp, Halle a/S.

This valuable work, published under the editorship of Dr. J. M. Eder, has reached its eleventh year, and, like former issues, contains a collection of articles of the first order on photography in its various scientific aspects. The reader may learn from its pages the progress of the year in optics, radiography, colour photography, process work, colour printing, &c., and the contributors include among their

number the well-known names of Drs. Rudolph, Steinheil, Miethe, Aarland, Husnik, H. W. Vogel; Professors Krone, Lainer; Herren Albert, Gaedicke, Schrank, Valenta. In a comprehensive description of recent lenses we notice a mistake concerning Wray's platystigmat. This lens is a doublet of three elements each, and the two combinations are somewhat different from each other; but we find the lens described as a doublet of the Aplanat type, with only two elements to each combination. The illustration does not represent Wray's platystigmat, but the 5×4 rapid rectilinear, actual size, working at *f*-5·6. The volume contains an excellent collection of prints in photogravure, collotype, three and four colours, process, &c.

News and Notes.

PHOTOGRAPHIC CLUB.—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, June 30. *Photography at the Jubilee.*

THE Gem Dry Plate Company, Willesden Green, are issuing an interesting set of photographs of the Directors of the Company, views of the factory, and a group of the staff.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for current month has been awarded to Mr. H. Cheat, 2, Richmond-street, Totterdown, Bristol, for his negative, *Riding on the Gate.*

THE Council of the Incorporated Gas Institute has awarded Dr. Welsbach the "Birmingham" medal in recognition of the invaluable services rendered by him to the gas industry by means of his invention of an incandescent system of illumination.

AINTREE PHOTOGRAPHIC SOCIETY.—This Society will hold their Fourth Annual Exhibition of Photographic Work and Home Arts and Industries, including amateur paintings by local artists, in the Aintree Institute, Aintree, near Liverpool, on Thursday, Friday, and Saturday, December 9, 10, and 11, 1897. The Secretary is Mr. D. Travis, Fazakerley, Liverpool, of whom entry forms and all particulars may be obtained.

HER MAJESTY, as we have already announced, has been graciously pleased to approve of a likeness taken by Messrs. W. & D. Downey, which is known as the authorised Jubilee Portrait of Her Majesty. This likeness has been specially engraved by the well-known photo-engravers, The Meisenbach Company, Limited, West Norwood, who have done the work well and in their usual artistic manner. The engraving is full of gradations of light and shade from the highest lights to the full colour in the darkest shadows, and is a notable example of the high quality maintained by the pioneers of photo-engraving.

A VETERAN PHOTOGRAPHER.—Mr. Horatio N. King was, in connexion with the Diamond Jubilee Celebrations, commissioned by the Queen to attend at Buckingham Palace this week to take photographs, one being of the gold plate. This, for safety, is stored in a vault in the round tower at Windsor, and only sees daylight on very special occasions. Two or three weeks ago it was transferred from Windsor to Buckingham Palace, under a special escort. Mr. King was also commissioned to photograph the departure of the Royal party for the ceremony, as well as to attend the garden party to take photographs. We understand it is now forty years since Mr. King received his first commission from Her Majesty, and it is a proof of her interest in photography that she does not forget the earlier workers who served her.

THE Papermakers', Printers', Stationers', Bookbinders', Fine Art Publishers,' and Photographers' Exhibition, which is open at the Agricultural Hall till June 30, promises to be of more than usual interest, as several specimens of the most modern printing machinery, both American and English, will be on view, in addition to the numerous machinery exhibits in operation. A section will be devoted to sports, toys, fancy goods, &c., and in connexion with this there will be a variety of interesting demonstrations and displays of the Röntgen X rays, kinematograph, photographic lantern work, and other scientific entertainments, all of which will be free to visitors. The principal railway companies are running excursion trains during the period of this Exhibition and market, and visitors to the Jubilee should certainly set a day apart to visit it.

ON A METHOD OF REPRODUCING ASTRONOMICAL PHOTOGRAPHS.—"Professor Max Wölf, in his excellent article on the 'Reflector and Portrait Lens in Celestial Photography,' published in your issue of April 22 last, mentions a method of 'reproducing nebulous masses' from original negatives, and refers to my reproduction of a photograph of the nebula, M. 8, done in collaboration with Mr. Lunt. I have since tried the method on a number of other clusters and nebulæ with uniform success. My practice now is to use a very slow plate, capable of giving good contrast, and to give it the least possible exposure during contact printing from the original negative. I use the ordinary pyro-ammonia developer with half of the normal quantity of ammonia indicated, and with an excess of bromide. If there is the slightest indication of an image within five minutes, the plate is rejected as too much exposed. The development is continued for about forty-five minutes, with an occasional addition of a little more ammonia; the plate is, of course, kept rocking all the time in the dark. From the positive thus obtained a second negative is secured, and from it a second positive, and from the last a third negative, which is used for final printing on paper. The method of development is throughout the same as mentioned above. Faint details in outlying portions, for instance in the photographs of the corona, can be very easily brought out in this manner. No intensification by mercury or otherwise is employed by me, and I consider it absolutely inadmissible, as it is liable to effect the grain in the neighbourhood of the image, and thus to give a false extension of nebulous matter. The pure process of successive copying and bringing out contrast is perfectly legitimate, Scheiner and others having shown that the image does not spread thereby."—K. D. NABHAMVALA in *Nature.*

SOCIETY OF ARTS CONVERSAZIONE.—A very successful *Conversazione* was held on Wednesday evening, June 16, at the South Kensington Museum by the Society of Arts. The greater number of the galleries were thrown open to the guests, and an interesting programme of entertainments was provided. A selection of music was given by the band of the Royal Artillery in the Worth Court, and by the Red Band in the Architectural Court, while a vocal and instrumental concert was given by the Ladies' Euterpean Orchestra under the direction of the Misses Scott. Mr. George Grossmith also gave a humorous musical entertainment in the course of the evening, when the lecture theatre was thronged by a crowded audience. The guests, who numbered between 2000 and 3000, were received on their arrival by Major-General Sir Owen Tudor Burne, G.C.I.E., K.C.S.I., the Chairman of the Society, and by the Members of the Council.

NEW COMPANIES.—The Photo-decorated Tile Company, Limited. This Company was registered by Messrs. Burn & Berridge of 11, Old Broad-street, London, E.C., with a capital of 25,000*l.*, in 1*l.* shares. The objects of the Company are to enter into an agreement with the Gold Estates of Australia, Limited, and to carry on business as photographers, photo-engravers, printers, potters, clay-workers, &c. The Gold Estates of Australia are the first managers; remuneration, ten per cent. of the net profits. Registered office, 20, Bishopsgate Within, E.C.—F. D'Arcis & Company, Limited. This Company has just been registered by F. W. Hales, of 39, Victoria-street, S.W., with a capital of 1500*l.*, in 1*l.* shares. The objects of the Company are: To enter into an agreement, and to acquire and carry on the business of landscape and architectural photographers, carried on under the style of F. D'Arcis & Company, at 121, Pall Mall, London, W. Registered without Articles of Association. Registered office, 3, Waterloo-place, S.W.—The Photographic Artists' Association, Limited. This Company has just been registered with a capital of 1000*l.*, in 1*l.* shares, by Mr. F. H. Edwards, Solicitor, Sheffield. The objects of the Company are to enter into an agreement with F. R. Boardman, and to carry on the business of photographers and dealers in photographic apparatus and materials. Registered without Articles of Association. Registered office, 238, Tottenham Court-road, W.

ROYAL RECOGNITION.—So far as we are aware, no case has been reported of a photo-mechanical factory being honoured by a visit from a reigning sovereign and suite at that sovereign's own request and suggestion. To L. Van Leer & Co., of Amsterdam, this distinction has fallen, and every man and boy in the place is immensely elated. The Queen of the Netherlands usually spends only a few days of the year in her capital, and this year, a couple of days before arriving in the city, the Queen and the Queen Regent expressed their wish to see the Van Leer factory on April 29. On their arrival at the factory they were escorted over the building by the members of the firm. They took great interest in all branches of the work, and especially in the colour-printing department, where they spent over an hour. In the new building, devoted to process work, the visitors expressed great interest in every detail, and asked so so many questions that Mr. Van Leer was obliged to explain the process as fully as possible. The giant cameras (by the bye, British built, as is all their machinery), the electric installation, and especially the routing and bevelling machines, came in for a special share of admiration, but the climax of the interest was only reached in the heliotype printing room. Here, on the largest machine, were two portrait plates of the Royal ladies, from crayon drawings, by Therèse Schwartze, the celebrated Dutch artist, copies of which were printed for each of their Majesties. The details of the machines having been explained to them, the plates were forthwith destroyed. Meanwhile the men, numbering over 300, from the printing departments, had marshalled in the central yard, and, as the royal visitors departed, the unanimous cheering was loud and long-sustained. The whole section of the city in which the works are situated was in gala mood, and large enthusiastic crowds lined the banks of the Amstel to witness the arrival and the departure of the visitors.

ARTIFICIAL DIAMONDS.—At the Royal Institution, on June 11, Sir W. Crookes, F.R.S., gave an account of the South African diamond mines, and, after briefly surveying the chief chemical and physical characteristics of the diamond, proceeded to say that speculations as to the probable origin of the diamond had been greatly forwarded by improvements in the means of obtaining high temperatures. Thanks to the success of Professor Moissan, they could now be manufactured in the laboratory—minutely microscopic, it was true, but with crystalline form and appearance, colour, hardness, and action on light, the same as the natural gem. The first necessity was to select pure iron and to pack it in a carbon crucible with pure charcoal from sugar. Half a pound of this iron was put into the body of the electric furnace, and a powerful arc, absorbing about 100 horse power, formed close above it between carbon poles. The iron rapidly melted and saturated itself with carbon. After a few minutes' heating to a temperature above 4000° C., the current was stopped, and the dazzling, fiery crucible plunged in cold water until it cooled below a red heat. Iron increased in volume at the moment of passing from the liquid to the solid state; hence the expansion of the inner liquid on solidifying produced an enormous pressure, under stress of which the dissolved carbon separated out in a transparent, dense, crystalline form—in fact, as diamond. To obtain the diamond from the metallic ingot required a long and tedious process of treatment with various strong reagents, and the specimens thus obtained were only microscopic. The largest artificial diamond yet made was less than one millimetre across. Many circumstances pointed to the conclusion that the diamond of the chemist and the diamond of the mine were strangely akin in origin, and the diamond genesis must have taken place at great depths under high pressure. How the great diamond pipes came into existence was not difficult to understand. After they were pierced they were filled from below, and the diamonds, formed at some epoch too remote to imagine, were thrown out with a mud volcano, together with all kinds of *débris* eroded from adjacent rocks. According to another theory, the diamond was a direct gift from Heaven, conveyed to earth in meteoric showers, and the so-called volcanic pipes, simply holes bored in the earth by the impact of monstrous meteors. The process of making artificial diamonds in the laboratory was explained and shown in method, but the crucible failed.

A Betting Photographer. Enormous Fines.—James Goldie, or Curren, photographer, of 678, Commercial-road, E., was summoned at the Thames Police Court on the 17th inst. for keeping open his house for betting purposes. The prisoner pleaded guilty to five summonses. Mr. Muskett, who appeared for the prosecutor, stated that, when Superintendent Wells executed the warrant, books seized showed that during the last three months the defendant had received 1684*l.*, on account of bets, but he had to pay out 1564*l.*, so that his profits had not amounted to very much. During the five days mentioned in the summonses he had taken 258*l.*, but he had paid out a considerable portion of that on account of losses. Considerable difficulty was experienced in ascertaining what kind of betting business the defendant had carried on, owing to his having carried it on in a private room. The photograph business was a "blind," and he looked upon the case as a serious one. Mr. John E. Waters, who appeared for the defendant, submitted that, as the law stood at present, betting was not illegal, neither was a book-maker's business an illegal one, but where it could be carried on he did not know. In view of the fact that it had been decided that a house was "a place," the defendant had no alternative but to plead guilty. He must submit, however, that he was no worse than the swells who were then at Ascot. It was a scandal of the age that small men should be the victims of the Betting Houses Act, whereas the big ones were not molested. Mr. Dickinson said he could not take any cognisance of Ascot. He had noticed that, although betting prosecutions were frequent, the practice was not stopped, so that it was apparently a profitable business. On the first summons there would be a penalty of 50*l.*, and 5*l.* costs, and a fine of 50*l.*, and 1*l.* 3*s.* costs, on each of the other four.

The East London Art Exhibition (Photographic Section).—The awards in this small, but interesting, Exhibition of photographs were as follows:—Class I. (Portrait Figure and *Genre*).—Miss Bell, for a portrait study, *Cicely*, silver medal; T. Lee Syms, *Study*, bronze; A. L. Spiller, *On Guard*, certificate. Miss Bell's portrait of a young lady is admirable, and the posing and treatment of the figure in Mr. Syms' photograph are undeniably good. We are sorry that Mr. Spiller saw fit not to avoid the hard reflection on the breastplate of the warrior supposed to be on guard; otherwise the result might have obtained a higher award. Class II. (Architecture).—H. W. Bennett, for *South Aisle, Ely*, silver; E. R. Bull, for *The Chantry, Manchester*, bronze; —. Booth, *The Galilee Chapel, Durham*, certificate. An excellent class, difficult to judge. Mr. Bennett's photograph is a singularly well-rendered effect of lighting, and, when Mr. Booth has acquired the nice art of framing up and suiting the frame to the subject, his work, which is intrinsically very good, will be more effective to the eye for exhibition purposes. Class III. (Architecture).—C. F. Archer, *By the Brook*, a pretty little landscape, transacted with surprising delicacy and charm, silver; W. A. J. Hensler, *The Wreck*, bronze; W. J. Nicolls, *Summer's Morning*, certificate. Class IV. (Lantern Slides).—Again a difficult class to judge, especially without a lantern. The awards were: Dr. J. W. Ellis, for an architectural study, *South Porch, Holgoet*, silver; F. W. Edwards, a Tinworth panel, silver; H. T. Malby, for a flower study, *Pheasant Eye*, bronze. The silver medal was withheld in the Beginners' Class, but the bronze went to Mr. T. R. Nunn, for a capital photograph of Broadstairs, and a certificate went to Mr. H. Rayner for a little view giving a glimpse of the Orwell. There is a fine loan collection of photographs in view containing examples by most of the principal workers of the day.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
.....	Bradford Photo. Society	Open Discussion: *Development.* Leader, G. Swain.
.....	North Middlesex	*Lantern-slide Making.* J. A. Hodges, F.R.P.S.
.....	Hackney	
.....	Photographic Club	Photography at the Jubilee.
July.		
.....	Bradford Camera Club	*Lenses.* C. C. Vevers.
.....	Oldham	Excursion: Alport for Lathkil Dale. Leader, J. Brooks.
.....	Darwen	Excursion: Lower Darwen and District. Leader, J. W. Smith.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 17,—Mr. R. P. Drage in the chair.

Nomination of Officers.

The following members were nominated for service during the coming year:—*Trustees:* Messrs. A. Haddon and J. B. B. Wellington.—*Committee:* Messrs. E. H. Bayston, R. Beckett, R. P. Drage, J. T. French, E. G. Harvey, J. E. Hodd, G. H. James, F. C. Kellow, A. Mackie, Paul Martin, J. S. Teape, W. J. Wall, H. Snowden Ward, W. D. Welford, E. T. Wright.—*Curator:* Mr. J. B. Grundy.—*Recorder:* Mr. A. W. W. Bartlett.—*Librarian:* Mr. H. C. Tapson.—*Secretary:* Mr. T. E. Freshwater.

The Chairman announced that Mr. Freshwater felt that the time had arrived when he must resign his office of Secretary, which he had taken up on the resignation of Mr. Everitt. The duties connected with the post were too many to permit of his continuing the work in his limited time. The Chairman regretted to hear such news, and hoped that, if one or two members were to volunteer to act the part of Assistant Secretary, it might be possible to induce Mr. Freshwater to continue in his office. He commended this suggestion to the consideration of the members.

Mr. A. L. Henderson referred to a paragraph in the *Photographic News* on the subject of who first photographed the Queen. He suggested the name of Mr. Bainbridge, who died in the fifties, one of whose negatives had been in the speaker's hands. At that time it was the aim to secure great density in a negative, and he described the means he took to obtain a softer print. A number of cracks in the film were filled in with black lead to start with, and the paper used for the print was previously washed to get rid of the free silver. This made the printing operation so slow that the negative required an exposure of a fortnight in the sun for each print, but the result was much improved. He believed the negative, which was one of the very early ones, was still in the Queen's possession.

The Hon. Secretary gave a short description of some of the objects exhibited at the second *Soirée* of the Royal Society on the 16th inst., mentioning Bonnaud's process of colour photography, published in 1888, in which the colours are dusted on a film in certain sequences, transferred to the porcelain, and burnt in; also the series of figures produced by Lord Armstrong by electrical discharges over a bitumen plate by means of a Wimshurst machine. The effects of the discharge were rendered visible by dusting the bitumen with red lead and sulphur, the positive and negative features being coloured yellow and red, respectively, indicating thereby the direction of the current.

Mr. Freshwater also showed some photographs taken on the occasion of the presentation of new colours by the Duchess of York to the boys of the Duke of York's School.

Mr. Henderson gave a few notes bearing on the effect in development which the various samples of water obtainable from wells and the different companies exercised. A substance composed specially for the improvement of these different supplies was also alluded to.

PHOTOGRAPHIC CLUB.

June 16,—Mr. Frank Haes in the chair.

The Chairman drew attention to some experiments which had been made by Mr. J. Hort Player in the reproduction of prints and engravings by imposing a sensitive sheet upon the print to be copied. He said he had not met with success.

Mr. Fry said that he was present at the meeting of the Royal Photographic Society when the method was explained and examples shown. He thought Mr. Haes would succeed if he adhered to the exact method used by Mr. Player. That gentleman had used bromide paper, and not a glass plate for obtaining his negative; he also gave a very much longer exposure than Mr. Haes had done.

The subject for the evening was the *Changing and Repacking of Plates and Films on Tour*, and an interesting discussion took place. Messrs. Bridge, Foxlee, Wallis, Welford, and Mackie described their methods. Although these varied in detail, the general idea of these workers seemed to be the same, viz., to repack the plates in such a way that they would not jar one upon the other. Film to film was accepted as a reliable method rather than the interposition of paper or other packing material, although it was pointed out that, if the development was to take place fairly soon after exposure, it made little difference whether paper was inserted between the plates or not. On the other hand, if development were to be deferred for a lengthy period, the insertion of sheets of paper introduced an element of uncertainty.

North Middlesex Photographic Society.—June 14, Mr. J. MacIntosh in the chair.—Mr. E. W. Hichcox, 228, Seven Sisters-road, was nominated for membership, and Mr. H. H. Lee was elected. Mr. Cox (the Hon. Librarian) announced that Mr. Haviland had presented the Library with two books on elementary chemistry. Mr. Mummery (the President) gave an account of the outing to Benfleet on Whit Monday. The weather was favourable, and the arrangements as regards the sustenance of the inner man were satisfactory, and a very enjoyable time was spent. Mr. Chapman Jones's paper on

Negative-making

was read by Mr. Steele, and a good discussion resulted, opinions differing as to whether, for picture-making pure and simple, it was advantageous to try and get a technically perfect negative, according to the writer's definition. The lecture was regarded as an excellent one, and containing a lot of matter for consideration. At the conclusion, a vote of thanks was voted to Mr. Chapman Jones for the paper, and to Mr. Steele for his excellent rendering of it.

Bradford Camera Club.—Mr. W. T. Wilkinson (President of the Wakefield Photographic Society) gave a lecture and demonstration on

Paper Negatives.

Mr. Walter Booth (President) occupied the chair, and there was a good attendance of members. Mr. Wilkinson said that paper negatives dated back sixty years, the first process being invented by Fox and Talbot, in 1841, and called the calotype process. This was followed by the waxed-paper process introduced by M. le Grey, in 1850. Both these processes were very complicated, and yielded but indifferent results. Glass held uninterrupted sway until 1869, when Warnerke tried to displace it by using an enamelled paper coated with collodion emulsion. This process was not a success, however, and the next step in advance was the introduction of the gelatine film, which has now completely driven collodion out of the field. In 1885 the Eastman Company introduced a new negative paper and many appliances, which, for a time, gave a great impetus to the use of paper negatives, but, as the nature of the paper used rendered a greasing operation necessary, it did not find much favour in the eyes of the amateur. To do away with the necessity of greasing negatives, Warnerke introduced a thin paper coated on both sides with sensitive emulsion. This was followed by the Eastman stripping film, a paper coated with soluble gelatine and sensitive emulsion. After development the negative was squeezed upon a glass plate coated with indiarubber solution. After some further processes the negative was stripped off the glass and a transparent film negative was the result. This lengthy and very uncertain process was finally superseded by the celluloid films as used at the present time. An attempt was made at the beginning of last season by Messrs. Wellington & Ward to revive the old stripping process, but it proved unsuccessful, and they have

ceased to manufacture the paper, having introduced in its place a new bromide paper. The great advantages of this paper were its extreme lightness and entire absence of grain and halation if the negative be properly exposed and developed. After the method of regulating the exposure and process of development had been explained by the lecturer, the room was darkened and several negatives were developed to illustrate what had been said.

Edinburgh Photographic Society.—June 2, Annual Meeting, Mr. F. P. Moffat presiding.—The reports of the Council and the Hon. Treasurer showed the affairs of the Society to be in a highly satisfactory state. Mr. James Patrick was elected President in place of Mr. Moffat, who retired, and Messrs. A. Eddington and J. Stewart Smith were elected Vice-Presidents. Four vacancies on the Council were filled by Messrs. F. P. Moffat, Alex. Allan, A. H. Baird, and J. Warrack, jun.

Kilmarnock and Ayrshire Photographic Soc ety.—An out-door meeting of this Society was held at Eglinton Castle on Saturday. There was a large attendance of members and friends. The party was shown over the grounds by Captain John Mackenzie Stewart, 1st V.B.R.S.F., Irvine. At the close, Mr. Ferguson made appropriate and feeling reference to the death of Mr. Robert Terras, Ayr. He moved that the Society record in their minutes the deep regret at the loss in the very prime of early manhood of one who, alike for his artistic ability and social companionship, made him a conspicuous and much-respected member of the Society. This was sympathetically approved of, and the Secretary instructed to send an excerpt to the widow and parents.

FORTHCOMING EXHIBITIONS.

1897.

June 25–30 ..... Paper-makers', Printers', Stationers', Fine-art Publishers', &c., Exhibition, Royal Agricultural Hall, Islington, London, N. Managing Director, W. E. Aylwin, 27, Leadenhall-street, London, E.C.

Sept. 1–Oct. 13 ..... Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.

,, 27–Nov. 13 ..... Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.

December 9–11 ..... Aintree Photographic Society.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BLEACHED LAC.

To the EDITORS.

GENTLEMEN,—That German friend of Mr. Reed was all right when he told him that bleached lac ought to dissolve in methylated spirit and make a clear solution without sediment. If the lac does not do so, it was bleached with chlorine and still contains some traces of it. In that case you have only to add some sulphuric ether to the methylated spirit and you will get a perfectly clear solution without sediment.—I am, yours, &c., E. ENK.

81, *Burgoyne-road, Harringay, London, June* 19, 1897.

THE PRICES OF FILMS, &c.

To the EDITORS.

GENTLEMEN,—In your issue of June 11, "Wandering Amateur" suggests that Solio paper should be supplied cut to the sizes of our Bull's-eye pictures.

Your correspondent should have made inquiry about this before making his statement in the public press, and he would have found that Solio is put up in packets of the sizes in question, and has been so sold by us for more than a year past.

As to the comparison of films and plates, "Wandering Amateur" will find that our present bullet Kodaks take both plates and films. The films are absolutely essential when travelling, and wherever compactness, lightness, facility, and comfort in changing are desired. The glass plates are useful where two or three exposures at a time have to be made and developed.—We are, yours, &c.,

EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED.

115 & 117 *Oxford-street, London, W., June* 18, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

The Rev. A. H. Berger, Cobham Vicarage, near Gravesend.—*Photograph of the exterior of Canterbury Cathedral.*

Alexr. M. Riddle, 4, Strathaven-terrace, Oban.—*Photograph of St. Columba, thirteen centenary group, Iona, June* 9, 1897.

CERAMIC PHOTOGRAPHY.—HUNTS. There are no patents in connexion wi either the powder process or the substitution method of produci enamels.

W. T. BARKER.—We believe that no permission is necessary, but, to ma assurance doubly sure, you had better write to the Clerk of the Loc Board of Works.

STARCH MOUNTANT.—T. ENGLIS. Preserving starch paste with antiseptics not to be advised, as it is always more adhesive when freshly mad The trouble of making a little starch paste when required for use is little as not to be worth consideration.

OLD MANUSCRIPT.—W. DAVIES. As several dozen copies are required, t best and cheapest way will be to have the different pages reproduced l photo-lithography. Messrs. Waterlow & Sons will undertake the wo for you ; so, indeed, will any photo-lithographer.

ALBUMEN AND GELATINE.—R. STOTT. Albumen and gelatine can be mix in any proportions and yet remain perfectly transparent, provided th temperature of the mixture is kept below the coagulating point of th albumen. Your trouble has been due to making the mixture too ho so that the albumen has coagulated.

FORMULÆ WANTED.—F. O. EAGER (Hamilton, Ont.) writes: "Would yo kindly give me a formula for 'making' platino-matt bromide pape also a formula for 'making' Aristo platino printing-out paper."—I reply : Our correspondent's best plan will be to study the following tw works : *Gelatino-Chloride Printing*, by Woodbury (published b Hazell, Watson, & Viney, Creed Lane, London, E.C.), and *Bromid Printing*, by Just (published by Percy Lund & Co., Bradford).

ROYAL ARMS.—A. A. A. says: "Some time ago there was a shooting part at the mansion here, and I was engaged to photograph the company amongst whom was the Prince of Wales. Afterwards I obtained sitting from the Prince by himself, and supplied him with copies since Would there be any harm in my putting up the Prince of Wales' feathers and by appointment?"—Yes. Unless you have obtained th Royal Warrant to do so, you will render yourself liable to a heav penalty.

PHOTOGRAPHING FANS.—W. H. F. says: "I expect shortly to have to photo graph a number of very valuable fans, which are in elaborate an brilliant colours. Can you give me any hints, as I have never done an work of that kind before?"—The only hints we can give are to us orthochromatic plates, and, if there is much blue in the picture, to us a yellow screen, more or less deep, according to the subject. There i no more difficulty in photographing fans than there is photographing any other coloured objects.

FAKER OF COLOUR says :—"In some formulæ in the ALMANAC, p. 978, th word 'part' is used thus,—Encaustic Paste. Pure Wax, 500 'parts' gum, 10 'parts.' Why cannot they put it in plain English, and le people understand. Will you explain?"—In reply : It would puzzl our excellent friend to make the above specimen of English plainer than it is. However, for his information, we may say that the term "parts" in a formula is used to denote parts by weight or volume of the particu lar ingredients, which may vary in quantity but not in proportion.

RYLEY DRY PLATES.—ALBION asks : "Will you kindly tell me, in Answers t Correspondents, if the ordinary iron developer for most plates is used fo developing plates as prepared by Dr. Ryley? It is published in THE ALMANAC for 1896, on page 783 ; by doing this you will oblige."—No The developer best suited to these plates is an acid solution of pyro gallic acid, to which a small proportion of nitrate of silver has been added. Say, pyrogallic acid 3 grains, acetic acid 15 minims, citric aci 1 grain, water 1 ounce. To this add 3 or 4 drops of a twenty-grai solution of nitrate of silver.

PHOTOGRAPHING PLATE.—ARTHUR NICHOLLS says: "I have some very highl polished plate to photograph, and I do not know which is the best thin to coat them with to reduce the reflection from their highly polishe surfaces. Could you oblige me with any information that would hel me over the difficulty? if you can, I shall esteem it a great favour."— Stipple the surface of the plate over with a small lump of stiff putty ; or the following will dull the surface : damp the atmosphere of the studio by watering the floor; then, when the plate is ready for exposure, place a piece of ice in the vessels ; moisture will then condense on the surface and destroy its brilliancy. We do not undertake to answer queries by post.

COMBINED CLEARING AND INTENSIFICATION.—W. F. says : "In the JOURNAL for February 19 (see p. 119), there is an article on 'Combined Clearing and Intensification,' and reference is made to a notice 'some years ago' on the action of nitric acid and common salt. I should be glad of a reference.—If the mixture has to be heated like the nitric acid and bromide, I should be obliged for a hint as to judging when action is complete." Place 1 ounce of chloride of sodium in a glass flask and pour upon it 2 fluid ounces of nitric acid sp. gr. 1·42. Apply gentle heat until chemical combination commences, which will be indicated by effervescence and the evolution of nitrous fumes. Keep the flask at a moderate temperature, say, 150° Fahr., until the action appears complete or the effervescence ceases, though the crystals will remain undissolved. then add about an equal quantity of water or sufficient, on raising the temperature, to complete the solution. Keep the resulting yellow liquid as a stock solution to be diluted as required. The operation will be better conducted in the open air, as very irritating fumes are given off, and the solution should not be too tightly stoppered, as a further chemical change continues for some time, and gas is given off which may burst the bottle.

*** Several answers to correspondents unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

We draw the attention of our readers to the fact that the twelfth meeting of the Photographic Convention of the United Kingdom opens at Great Yarmouth on Monday, July 12, and will continue throughout the week. The President-elect is Mr. F. P. Cembrano, jun., whose former services to the Convention in the capacity of its Honorary Secretary, as well as his great abilities as a photographer, well qualify him for the position. Itself one of the most attractive, if unconventional, resorts on the East Coast, Great Yarmouth, as the gateway to the reposeful and fascinating district of the Broads, which is sometimes called the English Holland, provides a theatre for a Convention meeting of a wholly novel kind, the characteristic scenery and associations of the neighbourhood differing entirely from those of the eleven towns previously visited.

* * *

The brief programme of the week's doings, which we printed in the Journal of June 18, is full of variety, and the excursions, including, as they do, road, river, rail, and sea journeys to places of archæological and scenic interest, have evidently been chosen for the purpose of tempting large attendances. That part of the programme which provides for the business side of the meeting is, we think, singularly happy in that it affords photographers the opportunity of listening to papers on some of the foremost topics of the moment. Pictorial photography, copyright, photographic lenses, the fixing of albumen prints, the half-tone process, and colour photography are all peculiarly apposite subjects for discussion just now, and we shall be disagreeably surprised if they do not well serve the purposes for which they have been chosen. Their educational effects should be most marked.

* * *

Altogether the programme bears a most inviting aspect. A judicious combination of pleasure and knowledge is at the disposal of visitors, of whom we trust there will be a large number, so that the efforts of the local committee to make the gathering successful may be crowned with success. We also desire to specially remind our readers that one of the attractions of the Convention meeting is to be a loan Exhibition of East Anglian photographs, illustrating the scenery, architecture, &c., of the counties of Essex, Suffolk, Norfolk, Cambridge, and Lincolnshire. The Council of the Convention are anxious to make the Exhibition a large and representative one, and we therefore ask our readers having photographs of the kinds mentioned to kindly lend them for the purpose. They may be addressed, up to July 9, either to Mr. F. H. Sayer, 26, King-street, Great Yarmouth, or to Mr. Harvey George, the Tower, Gorleston, Great Yarmouth.

* * *

The prospectus has been issued of Ross, Limited, with a capital of 120,000*l.*, divided into 60,000 five per cent. cumulative preference shares of 1*l.* each, and 60,000 ordinary shares of 1*l.* each. The ordinary shares are taken by the vendor, and 40,000 of the preference shares are offered for subscription. The Directors of the Company are Mr. J. Stuart (Managing Director), Dr. John Attlee, Mr. Traill Christie, and Mr. F. H. Wenham. The Company has been formed to acquire, carry on, and extend the well-known business of Ross & Co., 111, New Bond-street, and Clapham Common, which was established nearly seventy years ago.

* * *

The assets to be acquired are equal to 76,263*l.* 8*s.* 7*d.*, and the working capital will be represented by a sum of 41,221*l.* 4*s.* Taking the basis of the last three years, the

certified net profits are sufficient to provide for the preference dividend more than three times over. The purchase price has been fixed at 84,722*l.* 7*s.* 10*d.* payable as to 24,722*l.* 7*s.* 10*d.* in cash or preference shares, and as to the balance in ordinary shares. The services of Mr. Stuart, the Managing Director, and the present heads of departments will be assured to the Company for a minimum period of five years, and we gather from the prospectus that large extensions of the business are in contemplation.

* * *

The following wise observations by our contemporary, *Nature*, will be cordially endorsed by those of our readers who are interested in the progress of photographic technology, and are sensible of the greater facilities provided by Continental nations for its study than are obtainable in Great Britain: "At the present day Britain is distinctly behind Germany in the national endeavour to face the conditions of national peaceful competition as they exist. Our Government has been supine in matters in which the German Government have put forth all their strength, and so, even assuming that the scientific spirit and the individual endowment and advancement have been the same in both countries, we have fallen sadly into arrear as to those educational and scientific institutions on which we must depend for the future production of workers and new discoveries. There are signs that this condition of things is mending, that the error is being acknowledged by those who, if they choose, can readily correct it. The Duke of Devonshire last week, at the opening of the International Congress on Technical Education, announced frankly: 'We have in this country a Department of Education, but its functions are almost entirely limited to elementary education, and we have not in our administration any minister who properly corresponds to the Minister of Education of other Governments.'"

* * *

Messrs. Eyre & Spottiswoode made arrangements to photograph the actual ceremony of the Queen's Jubilee Thanksgiving in front of St. Paul's Cathedral on the 22nd ult., as well as the procession, both arriving at and leaving St. Paul's. It is proposed to issue these pictures in various styles, such as Woodburytype, collotype, photochrome, photogravure, &c., to retail at various prices to suit all requirements. It is intended to specially issue photographs in colour by a most approved process: 9 × 7 inches unmounted, to retail at 1*s.*; 21 × 15 inches mounted, to retail at 10*s.* 6*d.* Sample photographs will be in the hands of the firm's representatives at the earliest possible moment, and samples of the actual styles intended to be issued will be ready in about fourteen days from date of ceremony.

* * *

The Birkenhead Photographic Association, whose address is Y.M.C.A., Birkenhead, offer "to photographers everywhere" two medals (one silver and one bronze) for the best set of not less than three, and not more than six, lantern slides, illustrating the Diamond Jubilee Celebrations, 1897. The competing slides may be pictures of Jubilee Celebrations anywhere within the British Isles, and taken at any time during June, July, or August, 1897. Further information may be had from the Hon. Secretary, Diamond Jubilee Competition.

* * *

Messrs. R. & J. Beck, of 68, Cornhill, inform us that they have secured a number of excellent original negatives of the Jubilee ceremony at St. Paul's, which they are selling at very moderate prices. Local professional men or firms who are reproducing pictures of the Jubilee might be interested in knowing that such is the case. The sizes are half-plate, 5 × 4, and quarter-plate.

* * *

Messrs. Thorn & Hoddle write us: "In the paragraph on page 387, referring to our 'Incanto' Generators, you have unwittingly, done us an injustice in confining your remarks to our Pattern B Generators only. The fact is, that every generator we make, both A and B patterns, meets the requirements of the London County Council, and, as it is obviously of much importance to us, we ask that you will rectify the error in your next."

* * *

We are informed that the Sandell Photographic Exhibition will open on or before July 12, at the Modern Gallery, 175, New Bond-street, and will consist of over 400 subjects, the majority never before photographed, including the City Companies' Halls; the Guildhall and Mansion House; Lincoln's Inn, Gray's Inn; Lambeth Palace; Westminster Abbey; Windsor Castle; the Monuments in St. George's Chapel, and the Albert Memorial Chapel, Windsor; the Royal Mausoleums, Frogmore; St. Peter's, Rome; St. Mark's, Venice, &c. The Exhibition will be open from 10 a.m. to 6 p.m. and from 7 to 10 p.m. daily, and there will be lantern illustrations and demonstrations on Wednesday and Saturday evenings.

* * *

In the distribution of Jubilee titles photography was scarcely honoured even in the most indirect manner. Mr. W. Crookes, Dr. Huggins, Mr. Norman Lockyer, and the Astronomer Royal are known to employ photography in their scientific labours, but no original work, essentially photographic in character, is associated with their names. It was expected by many that at least two eminent men of science connected with photography would have been selected for knighthood.

* * *

Camera Notes is the title of the official organ of the Camera Club, of New York, a copy of which has been sent us. It is a elegantly printed publication in an attractive green cover, issued quarterly. Photogravures of important achievements in pictorial photography, articles, club and general news, and half-tone illustrations are to be given in each number. The copy of *Camera Notes* that is before us is full of excellence, photographs, printing, and paper being signally good.

* * *

We are much interested to learn that Messrs. R. J. Appleton & Son, of Bradford, took animated photographs of the Queen's Procession as it passed St. George's Church in the Borough on Jubilee Day, June 22. They then hastened across London to the Midland terminus. A special carriage of the Bradford train had been reserved for developing purposes, and the negative and positive were produced *en route*. That same evening the pictures of the London procession were publicly shown at the offices of the *Bradford Daily Argus*. To Messrs. Appleton and to our contemporary great credit is due for the enterprise and skill with which this unique bit of photographic work was conceived and executed.

HINTS ON PHOTOGRAPHING POLISHED SURFACES.

EVIDENTLY the photographing of highly polished surfaces presents difficulties to some, if one may judge from the number of queries that are continually being replied to through the Answers column; but there is really very little difficulty in the way if a few simple expedients be resorted to. Suppose, for example, a group of plate has to be photographed, some portions of which are highly burnished, while others are frosted or matt. The most common, and, on the whole, perhaps the best, way of dealing with it is to take a piece of tolerably hard putty, and with it evenly dab, or stipple, over the bright portions of the metal; it will dull the surface, and thus prevent reflections—the only source of trouble. After the photograph has been taken, the putty can quickly be cleaned off with a plate brush charged with whiting and a little benzole.

Another plan, which is frequently adopted, when photographing cups, vases, and the like, is to moisten the atmosphere of the studio, either by sprinkling the floor with water, or by means of a scent sprayer, and then placing a lump of ice in the vessel. The moisture in the room then condenses on the cold surface of the metal, and thus renders it dull and non-reflective. When this method is adopted, the precaution must be taken that everything is ready for the exposure being made before the ice is introduced into the vessels, as the moisture condenses rapidly on the cold metal, and soon collects in sufficient quantity to run down the sides in tears. After the exposure is made the ice should at once be removed, in case a second negative has to be taken, in which case it can be reintroduced, when the moisture will condense afresh. We are here assuming that the articles to be photographed are such that ice may be put into them, but that is not always the case; still advantage may be taken of the condensation of moisture by simply keeping them for some time previously in a cold place; then, when they are brought into a warm or damp atmosphere, condensation will take place.

There are cases, however, where the owners of the plates will neither allow the putty to be employed nor ice to be used. Then the difficulty of the photographer is increased, but with judgment it may be overcome. He must now depend entirely upon the illumination of the objects, and that alone. The main thing is to so light the subjects that there are no reflections from them in the direction of the lens. As the angle of reflection equals the angle of incidence, it is obvious that all front light must be stopped off, and only a side light used, so that all the reflections are away from the camera. The light falling on the objects should be as concentrated as possible, and if there are any deep shadows—and there will be if the highly burnished portions are in shadow, as then they will appear nearly black—they may be softened by means of a reflector, care, of course, being taken that none of the light from it reaches the lens. The best angle of light for most subjects will be about 45°. That angle will be found to show up the chasing or engraving very clearly, but a more direct side light will often do so still better.

The development of the negatives should be done tentatively, so as to get out all the detail in the shadows before density is obtained in the lights. Very often, besides the chasing, there is an inscription, and, in the case of a presentation plate, it is imperative that it be distinctly rendered. Here, again, a strong side light is an absolute necessity, for, unless one be used, the inscription will not be readable in the photograph. Here is a dodge that many do not know of. It is this: Take the article or the inscription plate to a copper-plate printer, and get him to fill in the lettering with ink, as if he were going to print from it. As the letters will now be in black ink, the inscription will be very distinct in the photograph; the ink can afterwards be removed with a little benzole or turpentine.

One thing to be specially avoided in photographing plate is under-exposure and a forced development, which are the most common faults in photographs of plate. The exposure should always be timed for the shadows, and not for the lights, as is too frequently the case. In photographing any bright objects, a great advantage will accrue from the use of backed plates.

Copying Daguerreotypes seems to be a difficulty with some, but these pictures are really very easy to copy if we keep in mind the fact that the angle of reflection and the angle of incidence are equal; hence, if all front light be avoided, and the picture illumined by a side light only—say an angle of 45°—an excellent reproduction will be obtained.

Bright machinery has often to be photographed, and sometimes where it is very unequally lighted. The only thing to be done under these conditions is to paint over the polished portions, or, better still, the whole machine, with flatting colour. This most engineers now do who have their machinery photographed. The flatting colour is readily cleaned off with benzoline or turps, and a pledget of cotton waste. Usually the maker's name is on the machine, and it is important that it shows very distinctly in the photograph. As the letters are usually in relief, it is a good plan to just whiten the surface of them with a piece of chalk.

In photographing tombstones or monuments—say of polished granite, with the letters in gold—it is sometimes difficult to get the inscription distinct, even when it is illumined by oblique strong sunlight. The best thing to do in a case of this sort is to make up a stiff paste with whiting and water, and then fill in the letters with it, using a palette knife for the purpose. After the photograph has been secured, the whiting can be quickly removed, either by brushing it out dry or by washing it out with water.

Drawings by "Phiz."—One day last week two complete sets of water-colour drawings by "Phiz" (Hablot K. Browne), illustrating Chas. Dickens's works, were sold by auction. One was *The Old Curiosity Shop*, sixty-one in number, and it sold for 305*l.* The other series was *Barnaby Rudge*, sixty in number, and that fetched the same sum. The purchaser of the two lots is said to be Mr. W. Browne, of Edinburgh.

Colonel Waterhouse.—We are given to understand that Colonel Waterhouse, for many years assistant Surveyor General of India, is retiring, and, we believe, is now on his way home. During his long period of service Colonel Waterhouse has contributed largely to the advancement of photography and the different photo-mechanical processes. He was one of the earliest investigators of orthochromatic photography, long before it was applied to gelatine plates; and the benefit of all his researches in this, and in many other directions, he has always freely given to the public. Colonel Waterhouse has our best wishes in his retirement.

Elevated Observatories.—We have before now alluded to the fact that those engaged in observatories that are situated on mountains have not a pleasant time of it during the winter months. Neither do they always have, apparently, even at midsummer, for, during Tuesday night and Wednesday morning, last week, Ben

Nevis was visited by the heaviest snow storm that has been experienced by the meteorologists, so late in the year, since the opening of the Observatory in 1883. Falls of snow in June are not uncommon, but this one was exceptional, both on account of the quantity of snow that fell and the wintry character of the weather as regards the low temperature by which it was accompanied. It is reported that round about the Observatory the snow was piled up in wreaths from three to five feet high, and it is computed that the fall averaged somewhere about fifteen inches. Tourists in the district with cameras had an opportunity of obtaining winter pictures in the middle of June—a novelty to many.

Incongruities in Portraiture.—In the old days of the *carte de visite*, absurd incongruities in portraits were common enough, when scenic backgrounds were first used. It was no very uncommon thing to see a lady, for example, in evening dress, posed against a rustic stile, with a mountainous scene in the distance, or may be, sitting, fan in hand, in front of a seascape. Accessories were also sometimes used in the most indiscriminate way, such as indoor furniture with landscape backgrounds, or stiles and the like in elaborately furnished rooms, &c. Of course, we are not insinuating that all photographs contained these inconsistencies, but a large proportion did, as may be seen in many of the older albums. Nowadays one seldom sees anything very glaring in that way, but we do occasionally. We were recently shown one that was marked. It was a cabinet portrait of a lady in "rational costume," riding a bicycle in an elegantly furnished drawing-room—as depicted in the background. The photograph was good, the portrait excellent, and it bore the name of a West-end house, and that makes the subject the more noteworthy.

"Patent Applied for." — To use the term "patent," or "patented," is illegal, if the patent for the article to which the term is applied has not been completed, and subjects the user of the term to a heavy penalty. Some years ago it was thought by some that, if an application for a patent was made, and the provisional specification lodged, the applicant was forthwith entitled to use the term "patented"; but, as the result of an action at law, that idea was dispelled, and it was ruled that, up to the sealing of the patent, the applicant was entitled, if he chose, to use the term "patent applied for," and nothing more. But, so far as we know, there has been no case decided as to how long he is entitled to do that. When the application is made for a patent, with the provisional specification the complete specification must be lodged within nine months, and the patent sealed within twelve months. If this is not done, the thing lapses by effluxion of time. Under these conditions, has any one the right to affix the term, "patent applied for," long after the time for the completion of the patent has expired? We allude to this matter because we know that some photographic goods are being issued, bearing the inscription, "Patent applied for," when the time for completing the patent has long since expired, and also that the complete specification was not lodged at all. It is manifest that by this means an implied monopoly is secured which is not genuine.

Action at a Distance of Metals upon a Dry Plate.—A very remarkable paper, which we are reproducing in the JOURNAL, was read before a recent meeting of the Royal Society by Mr. W. J. Russell, F.R.S. His prefatory remarks refer to experiments he had been making with the metal uranium and its salts. He found that the metal itself, its salts uranous or uranic, its oxides, were all capable of exerting some occult action upon dry plates, as, when they were placed upon the film, the latter developed or darkening was produced. That the action was not chemical was proved by the experiment of placing the material in glass bottles and putting the bottles on the plate; the action was the same. There was little difference in the result between bottles of the material kept in the dark for some months and others that had been first exposed to sunlight. Next he placed the salts in pillboxes with glass bottoms, and placed perforated zinc screens upon the plate and boxes upon the zinc. Instead of a negative of the perforations he obtained an opposite result; the zinc, instead of stopping the radiations, appeared to intensify them; *ergo*, the zinc gave off developable radiations. This discovery he found had been anticipated by Colson, and described (as quoted in these columns at the time) in *Comptes Rendus*. The next thing to ascertain was whether the zinc vapourised, as it were, and so acted chemically. It was, however, found that the radiations from zinc were capable of passing through a variety of substances and producing a developable result. The action took place readily through celluloid, gelatine, gutta-percha tissue, vegetable parchment, collodion, and other substances. Zinc, cadmium, and magnesium metals were found by M. Colson to act in a similar way; and Dr. Russell discovered also that mercury, magnesium, cadmium, zinc, nickel, aluminium, pewter, fusible metal, lead, bismuth, tin, cobalt, and antimony acted in a similar manner, the above order representing a diminishing scale of radiative power in the order given. Experiments were made to see if moisture could be the active agent, but, moisture or no moisture, the action was identical. The zinc acted if it were varnished with copal. Dr. Russell writes: "Any ordinary piece of wood laid on a plate will act like zinc in impressing its image."

ONE rather droll experience was met with. Being short of glass bottles for the uranium salts, ordinary pillboxes were used; they answered admirably, till it occurred to the experimenter to try the empty boxes; they emitted a similar radiation, the cheaper the quality the better the action. The above is a very bald abstract of these important experiments, and the whole object of the paper is rather to record facts than theories.

Photography, 1837-97.—In its record of the Queen's reign *Nature* quotes the following remarks referring to the art and science of photography being conterminous with the reign: "In 1837 Daguerre and Fox Talbot were founding photography. The Daguerreotype and Talbotype were given to the world two years later. What would the modern world do without photography, as we know it in this year of Jubilee? It has added ten thousand million stars to the astronomer's stock in trade; it is an invaluable ally in the study of the physics and chemistry of distant worlds; while, with a grand impartiality, it reveals to us the secrets of the ultimately little. Last of all, not content with adding to the pleasures and the knowledge of mankind, it comes to succour human life, and soon no hospital will be without its aid."

Photographing Sound.—Mr. C. V. Boys has been sending to *Nature* an account of his experiments in photographing a wave of sound which was visible to the eye following upon an explosion of dynamite. He describes how Mr. E. J. Ryves, in a letter to him, tells how he observed upon the ground, the sun shining brightly at the time, a shadow of the wave of sound which he was able to follow with his eye for upwards of half a mile, and so plainly that the writer was sure he could have photographed the travelling shadow if he had had suitable apparatus at hand. This was quite enough to set Mr. Boys experimenting, and he took his camera, which was only provided with an ordinary Thornton-Pickard shutter, a special electric shutter he had made being unusable through shortness of battery power. He obtained permission from Mr. Maxim to be present upon the next explosion, and further asked Mr. Paul to bring his cinematograph with him. Mr. Hunt, his manager, went and obtained a good series. Mr. Boys points out that there was no fear of the effect of any smoke made by the explosion being mistaken for the shadow of the sound wave, as the latter travels far more quickly than the material products of the explosion. But, though Mr. Boys saw the sound shadow, or "Ryves' ring," as he would term it, travelling along, the cinematograph series did not show it. This, he explains, is owing to the fact that, seeing the instrument was set to $\frac{1}{100}$ second exposures, the shadow would have to be at least eleven feet thick to be photographable, a thickness which it did not, to the eye at any rate, present. "Mr. Maxim, with his usual ingenuity suggested that perhaps what was observed was not a sound shadow

t all, but merely a progressive heading down as the explosive wave assed." Mr. Boys expresses the hope that other experimenters, aving an opportunity of seeing the detonations of high explosives ıould make any observations that opportunity allows, both in sunshine nd out. If under each condition the wave shows, it will be evident hat Mr. Maxim's theory should hold the ground, but that, if, on he contrary, it can only be seen when the sun is shining, it will be ood evidence of the correctness of the sound-shadow theory.

DIGRESSIONS.

No. XIX.—On Studying Pictures.

N papers written modestly to "fill up half an hour," papers usually ›roduced on compulsion of the Hon. Secretary, as amateur books used o be published "at the request of friends," curious ideas are sometimes ›roduced, reproduced, and finally stereotyped as almost inspired fact. There is the writer who unblushingly takes all he knows of chemistry rom a handbook, and retails it to his fellow members as something ıew, trusting that, when it comes to question time, they will put 'easy ones;" the other, who declares he "knows nothing about art," ınd is fond of finding occasion for saying those who *do* know some-hing of it spell the word grandly with a big A, and straightway proceeds to lecture you on the subject; the man who "knows a picture when he sees one, and can tell whether he likes it," usually a remarkable example of self-deception; and the one who declares that he can learn from pictures all that can be taught of art. This last phenomenon inspires the present article.

There are such things as Heaven-born geniuses, as everybody knows, or, at least, *they* know, who evolve marvellous things from their inner consciousness, who never deign to take a lesson, yet paint like Raphael or Michael Angelo, or, still better, like a modern impressionist, or, again, as the ancient American did, before photography and the minor arts had refined the country, used to shoot his enemy—at sight. But, strangely enough, this rapid method of learning "all about art" does not teach them much about principles, and they only evolve copies, and are never original. The superficial speakers to whom I allude boast that much more could be learned from seeing a few good pictures than from hearing about them or how they were produced. It will, however, be usually found that those who thus expose how little they know have really gained that little from what they have read or heard, rather than from what they have seen, or, if they have gained any good from looking at a great picture, it has not been without a guide, however unconscious they may be of one. Undoubtedly a time does come when the sight of great works is invaluable, but that is in an advanced stage of studentship.

There is much harm done by proclaiming that all that need be known may be gained by merely looking at pictures. The student is usually young and sometimes idle, and is quite ready to take the short cut of anybody who, professing to know the road, tells him he will "get there" by that path, without much care to question the authority, and looking at pictures is certainly easier than the study of years that it usually takes to make an artist.

Let us take the case of one who has kept himself blissfully ignorant of the teaching that is to be got from books, and relies for his knowledge on what he can learn from pictures, and see what he can make of one or two of the world's masterpieces. For convenience we will select a couple in the National Gallery. Let us begin with Titian's *Bacchus and Ariadne*. As he has never allowed himself the advantage of book knowledge, our student will never have heard of Ariadne, and all he ever learnt about Bacchus will have been from a public-house sign. It is safe to take this picture, because it has been acknowledged for centuries as one of the most perfect pictures yet produced, and I don't remember that a word has ever been written against it. Yet what can be the educational effect of such a picture upon a photographer with a totally untrained mind?

The first thing that will attract his attention is, that it is a large, square, dark picture, and if he allowed himself to be told anything, such as that it is one of the finest pieces of design and colour ever put on canvas, he would not believe it. His little photographic experience will have taught him that a square is a bad and ugly shape, and he will wonder how Titian could have made such a mistake as to have chosen it. His next impression will be that there is a naked young man jumping out of a vehicle something like a modern milk cart, drawn by leopards, and that there are ladies present in nearly the same condition. It will strike him as curious, that in those regions the children are born with goats' legs and little tails, and that great snakes are more plentiful and familiar than in Charing Cross-road, and he will come to the general conclusion that the picture altogether is a "rummy start." This is the effect on him who thinks he can learn better from a few pictures than from books. I will now collect a few of the things he might have learnt about this picture if he had condescended to consult books rather than trust to unaided ignorance.

Mr. E. T. Cook finely says of this masterpiece, in his excellent *Handbook to the National Gallery*: "A picture which is at once a school of poetry and a school of art. It is a translation on canvas of the scene described in Catullus, where Bacchus, the wine-god, returning with his revel rout from a sacrifice, finds Ariadne on the seashore, after she had been deserted by Theseus, her lover. Bacchus no sooner sees her than he is enamoured, and determines to make her his bride. Nothing can be finer than the painter's representation of Bacchus and his rout; there is a 'divine inebriety' in the god which is the very incarnation of the spirit of revelry." It is a suggestive picture, and every writer finds something interesting to say about it. But what does it suggest to the uninstructed photographer, who has never read a word on the subject? Charles Lamb, in his essay on *Barrenness of the Imaginative Faculty in the Productions of Modern Art*, too long to quote here, sees further into the mind of the artist; but there are people who will not allow that the telling of a story, however divine, has anything to do with art. It may have little to do with that technical part of art called *painting*—or, if "technical" is too strong a word, I would substitute "executive"—but I look upon the mental, or imaginative, part as a great part of art, whether the art is painting, sculpture, poetry, prose, or the drama. As a digression, I may point out that the feeling of some of the young painters of the present day is well illustrated in the following anecdote, which shows how much more is sometimes thought of the method of expression than the quality of the thing expressed.

C. R. Leslie, the father of the present Academician (whom I had the honour of knowing), tells how he "spoke one day to Stothard of his touching picture of a sailor taking leave of his wife or sweetheart. 'I am glad you like it, sir,' said Stothard; 'it was painted in japanner's gold size.'"

The *Bacchus and Ariadne* is as full of the painter's art as of poetry, and as "Greek" to the unread student as any part of it. Would he see, for instance, what Sir Joshua Reynolds saw of its harmony and colour, and how every part is thought out?

"To Ariadne is given a red scarf to relieve the figure from the sea. It is not for that reason alone, but for another of much greater consequence, for the sake of the general harmony and effect of the picture. The figure of Ariadne is separated from the great group, and is dressed in blue, which, added to the colour of the sea, makes the quantity of cold colour which Titian thought necessary for the support and brilliancy of the great group, which group is composed, with very little exception, entirely of mellow colours. But, as the picture in this case would be divided into two distinct parts, one-half cold, and the other warm, it was necessary to carry some of the mellow colours of the great group into the cold part—part of the picture, and a part of the cold into the great group; accordingly, Titian gave Ariadne a red scarf, and to one of the Bacchantes a little blue drapery."

Ruskin uses the picture to show how truth to nature may be sacrificed to truth of pictorial effect; how things "magnificently impossible" are allowable even in a picture in which a wild flower is painted with "laborious botanical fidelity."

Let us come down from the heights of poetical painting and take a picture, the subject of which is within reach of the photographer's humble materials. I cannot expect the unguided student to learn anything, even from Turner's landscapes, plain as is the evidence of their art, without a guide, but what will he gather from such an

apparently simple picture as Wilkie's *Blind Fiddler?* He may enjoy the picture, but he will learn little from it without what the American writers call "pointers."

It would be as easy to become a good cook by tasting the dishes as a good artist by merely looking at pictures. You may tell whether a dish was pleasant or disagreeable by sampling it, but never know how it was made without further information. It needs a cook to tell us why a dish is good or bad. The student may enjoy the taste of the made dish, but he will never discover how to make another like it out of his inner consciousness. No intuition, no innate taste, will be of much use to him—he must call in the aid of the cook; and it happens that this masterpiece of Wilkie's is as full of complex flavours, and contains as much art, simple as it looks, as any picture in the gallery.

What I have said of studying art from pictures alone applies equally to studying from nature without adequate advice. "Let nature be your teacher" sounds like a precious aphorism, but is very fallacious. "Go direct to nature for inspiration rather than follow the conventions of earlier workers" is a taking phrase, but is mischievous nonsense, and has had a pernicious effect on the art of photography.

This is not photography, neither is the picture we have been chiefly studying possible in our art; but we need not live by photography alone, or we should stand in danger of becoming more mechanical than we are already. There are times when a little excursion into the imaginative, some allusion to a world—I won't say entirely beyond our own, but in which there are rare countries, admits of a culture to which we have not yet, as photographers, aspired.

H. P. Robinson.

SILVER INTENSIFICATION OF GELATINE PLATES.

I.

It is rather surprising, to those who have ever tried it, that silver intensification is a thing practically unknown in connexion with gelatine plates; indeed, by the great majority of users of those plates, it is supposed to be an impossibility. So far is this from being the case that I have personally long been of the opinion that it is far away the best method that exists, when the negative is worth the trouble; not that it involves a vast amount of extra labour, or unheard-of care, but it requires a little more of both those commodities than the every-day amateur is likely to bestow upon exposures that do not matter much if they result in negatives or spoilt plates.

But, in serious work, I repeat, I am astonished that more use is not made of this method, at any rate than we hear of; for, whenever intensification is spoken of, it is almost invariably mercury in some form that is mentioned. The reason, or perhaps I should say the reasons, for this neglect are not far to seek. In the early days of gelatine plates, silver intensification was the natural resource where intensification was needed, as it had been in the days of collodion, whether wet or dry; but that was at a period when every one was quite familiar with silver intensification, and when gelatine plates were principally used by amateurs who were thoroughly accustomed to dry-plate work. If we turn back to the Almanacs of fifteen years ago we shall find several formulæ for this method of intensifying gelatine plates, and when we find such workers as Wratten and Wainwright, and the late J. Dudley Radcliffe—to mention only two names that I remember—recommending that form, we may be pretty sure that it is somewhat more than merely feasible.

But when the rush came, and gelatine plates were in the hands of every one—amateur and professional—pyro and silver, or iron and silver, rapidly fell out of use, simply because it would not work under the conditions forced upon it. It was a long time before the users of the new plates recognised the difference between gelatine and collodion, and the necessity for a far longer washing of the films at every stage. The old dry-plate workers who generally used hypo for fixing, too, knew from experience the amount of washing that even a collodion film requires, after hypo has been used, before it is fit for silver intensification, and they acted accordingly; but the professional, accustomed to cyanide, was perhaps not so careful on that point. At any rate, from one cause and another, silver intensification proved impracticable, and perhaps no wonder. Now that a new generation has sprung up, training in the old school, and working under its traditions, it is easy to explain why the easier mercurial methods still hold the field, in spite of the, at any rate, dubious character they bear for stability. The results obtained with silver are as far beyond suspicion of change as old collodion negatives, although it has been said that the action of the silver upon the gelatine must eventually result in its discolouration. But this is a complete fallacy, such a result would only follow careless manipulation, and I can vouch for the stability of silver-intensified gelatine negatives for ten years or so, as I cleaned off, about three years ago, a number of negatives at least that age, that were as free from stain or change as when first made.

The weak point of mercurial intensification is that its utility is limited within very narrow boundaries. If a negative is thin and veiled, it intensifies the veil as much, or, proportionately, more than the picture itself. If, on the other hand, the image is generally weak, but clean, or weak principally in the shadows, the intensification seems to go almost entirely to the high lights and parts that are already fairly dense, leaving the weaker portions that require it most practically untouched, and only increasing the contrast in hardness. A well-graded image that only wants a little more general vigour is really the only one that mercury will give a really satisfactory result with, and even then frequently will do as well with careful printing as with intensification.

But with silver the action can be regulated to suit the character of the original image; the density can be piled on to the picture generally, or it can be made to pick out the high lights, and give them "sparkle" if that is what is required, or again can be made to act as a sort of continued development, bringing up the weak shadows while adding but little to the density of the lights. In fact it affords as many opportunities for modifying the result as does the original development, and this can certainly not be said of any of the simply chemical forms of intensification.

The modified method introduced by Mr. J. B. B. Wellington, and alluded to in these pages a few weeks back (May 7, p. 294), avoided many of the troubles that surround the ordinary acid pyro and silver plan, from which it differs essentially in being an alkaline process. The solution itself is, in fact, a mixture of the developer and fixing bath with free silver, a happy "hotch potch" that entirely obviates any risk of staining from a chance admixture of any of the different solutions from imperfect washing. The effect of this strange mixture, however, is admirable, and there is only one fault to find with the process, and that is its comparative expense, although, as pointed out in the article referred to, this may be minimised when a number of negatives have to be treated; but, when only an occasional one has to be intensified, we have to fall back for convenience upon the acid method, with all its alleged faults.

After all, these faults belong rather to the manipulator than to the process. If the negative is perfectly fixed and washed, and is fairly clean in the shadows, there is no more trouble in using silver than mercury; and, even if the shadows are veiled, a better result is got with the former than with the latter. In fact, working on the lines indicated in an article on *Combined Clearing and Intensification* (p. 119), I, a few days ago, converted a miserably thin, foggy negative (?)—one of the good old-fashioned "burnt up" sort—into a fairly decent printer.

All that is really necessary is to get rid of the hypo and its combinations. The negative must be thoroughly fixed, *i.e.*, the whole of the unaltered bromide must be converted into the soluble hyposulphite, and this must be completely removed by washing, not by "hypo eliminators," although a subsequent application of the alum and hydrochloric acid clearing solution is advantageous, if not absolutely necessary. The hydrochloric acid in this, I fancy, acts in much the same way as the combined acid in the combined clearing and intensification method referred to. At any rate, when it is used, there is not the slightest difficulty in getting any amount of density with shadows, at least as clear and *colourless* as at the start. Using weak aqua regia, or a similar mixture of nitric and hydrobromic acids, the clearing of the shadows goes on simultaneously with the intensification, and, if the rest of the operations are properly performed, this method is undoubtedly *the* best for these over-exposed veiled negatives.

Occasionally, especially if the intensification be prolonged, the shadows of the negative will acquire a bright, transparent yellow, or even red, colour; but this is not of the slightest moment, as it disappears entirely under the final treatment, *unless it be the result of imperfect fixing or removal of the hypo.* Under the latter circumstances, however, the colouration is of a different character, which, with a very little experience, will be easily recognisable. It is this discolouration which has persuaded some individuals to condemn the silver method as wanting in stability; but, as the colour that is formed—undoubtedly by the action of the silver—easily

appears under the action of the alum and hydrochloric, or any similar, aring solution, and this is, or ought to be, followed by a final fixing, it difficult to see what injurious effect can remain that was not present in e plate before exposure. W. B. Bolton.

FOREIGN NEWS AND NOTES.

A New Developer.—M. M. Lumière and Seyewitz have made amidoresorcine hydrochlorate by the action of sodium nitrite and ydrochloric acid on resorcine, and they find that this is a powerful eveloping agent without any alkali. From many experiments they nd that a normal developer is—

Diamidoresorcine hydrochlorate	1 part.
Sodium sulphite (anhydrous)	3 parts.
Water	100 „

By increasing the quantity of diamidoresorcine the images become ess and less vigorous, and the developer does not act so vigorously. The same occurs when it is decreased. Increase of the sulphite ncreases the activity of the developer till ten per cent. has been used, nd beyond this point there seems no increase, and fog is caused. The addition of an alkali, such as carbonate of soda, also increases he rapidity of development, but, if more than 8 parts of a ten per ent. solution of soda be added, fog is caused. Acids retard develop- nent, and, if added in sufficient quantity, entirely stop it, but they do not allow one to correct over-exposure. Bromides act very energetically, and the addition of 1 part of a ten per cent. solution to 100 parts of developer produces instantly a marked effect. The solution keeps fairly well. This new reducing agent is very similar to amidol in its action, but is far more sensitive to the influence of bromides, and it is readily soluble in water, gives very soft results, with harmonious gradations in the half-tones.

Photographing Machinery and Metal Work.—Herr Häntzschel, in the *Photographische Rundschau*, treats very fully of this subject, and suggests that, when possible, machinery should be photographed in the open air, and sawdust or white sand should be strewn underneath to reflect the light up on to the lower parts, and thus prevent heavy shadows. As a background, paper or linen of a white or light grey colour should be used. In order to avoid reflections from the polished parts a cloudy day should be chosen for preference, and all bright parts should be dusted with powdered chalk. Should any part of it look black and heavy in shadow, light should be reflected on to this part by white paper, or cardboard covered with tinfoil. If any machine men are to be taken at the same time, care should be taken to place them in a natural position, such as they would occupy if actually at work. Herr Schmidt, of Munich, suggests dabbing the bright parts with a mixture of white lead, 250 parts lamp black, 10 to 15 parts turpentine, 70 parts linseed oil, varnish, 60 parts; this can be easily wiped off with a cloth.

Fish Glue in the Gum-bichromate or Artigue Process.—Herr Raphaels suggests in *Der Amateur Photograph* the use of Le Page's fish glue as a substitute for gum arabic in this process as follows:—

Fish glue	5 parts.
Water colours (in tubes)	10 „
Potassium bichromate (sat. sol.)	25 „

The mixture should be spread very thinly on paper, and when dry it should be printed as long as gelatino-chloride paper, and then developed in cold water. If the mixture is kept a week before use the exposure is considerably reduced, but an old mixture gives flat prints. Rough paper only should be used, and with pyramidal grain paper exquisite half-tones are obtained; a thin coating gives flat prints, a thick coating harsher prints.

Stripping Films.—Professor Lainer recently suggested the use of an alkaline solution of formaline for bathing negatives in prior to stripping, such as formaline, 1–4 parts; caustic soda, 15 parts; water, 200 parts. In this the plates were bathed for ten minutes, and then placed in a solution of hydrochloric acid, 15 parts; glycerine, 20 parts; water, 30 parts, for ten minutes, and then the films could be readily stripped by cutting round the edges, and lifting and pulling the film gently off with the fingers. In order to make extremely thin films, which would be useful for carbon printing, and also convenient for storing, he now suggests the coating of a glass plate with a solution of wax in ether, polishing and coating with a thin enamel collodion, containing one to two per cent. castor oil, and then transferring the stripped film on to this, squeegeeing and coating the negative with enamel collodion when dry, and then, next day, cutting round the edges and stripping.

A Subscription for Ducos du Hauron.—M. Chas. Mendel, the Editor of the *Photo Revue*, has started a subscription for M. Louis Ducos du Hauron, whose name is so well known in connexion with the subject of three-colour photography, and who was also the inventor of the anaglyph, or the method of producing stereoscopic relief in prints by the superposition of two coloured images, which were then viewed through coloured glasses. It is hoped to obtain sufficient to render his life a little easier, for he is now in somewhat straitened circumstances, and also to enable him to continue his experimental work.

Direct Photo-zincography.—M. Bordet recently described at the Conference of L'École Nationale the following simple method of photo-zincography: The zinc is first cleaned with dilute sulphuric acid, and then slightly grained in a five per cent. solution of nitric acid for twelve or fifteen minutes. It is then coated with the following solution: Nut galls (coarsely powdered), 250 parts; water, 5000 parts. Boil together till its volume is reduced to one-third, filter through muslin, and, when cold, add 50 parts of nitric acid and 3 parts of hydrochloric acid. It is then sensitised with bitumen, and exposed under a negative in the ordinary way, and developed with turpentine, and then passed into a five per cent. solution of acetic acid, well washed and dried, and a little oil smeared over the plate and the bitumen dissolved off with benzine, and the plate may be mounted and printed from at once.

THE PINHOLE IMAGE THEORY IN SCREEN-PROCESS PHOTOGRAPHY.

[The Practical Process Worker.]

Certainly, for eight years, the writer has been teaching his pupils, in half-tone block process, that each aperture of his cross-line sealed screen might be regarded as a "pinhole lens," forming a vignetted image of the lens diaphragm, and was also, he believed, the first to publish this idea.

Emphasis was placed upon the statement of fact that, in order to obtain the best images of the lens aperture with the least disturbance from diffraction, the screen must be held at a certain distance from the sensitive plate, this distance varying according to the character of the screen.

This theory has been generally accepted at the date of this writing, and it is perfectly true that, under the conditions stated, vignetted images of the diaphragm aperture are produced, and diffraction is not a seriously disturbing element in the calculations for controlling the gradations of light and shade in the negative.

Nevertheless, it is a mistake to assume that the screen aperture produces an ordinary pin-hole image at such a short distance as that at which the sensitive plate is placed, for it does not. The writer's first knowledge of this fact was communicated to him by Mr. Max Levy, who not only suspected the truth, but proved it by a series of ingenious experiments, recording the results by photo-micrography.

In Stokes's *On Light** (pp. 46-70) is presented, without mathematics, and therefore, comprehensible by everybody, a clear statement of all that part of the theory of diffraction necessary to an understanding of what takes place when the light rays pass through the screen aperture. All of it should be read, but a single paragraph explains one of the most interesting facts, viz., that at one screen distance the "pinhole's image" of a small circular diaphragm aperture (giving approximately parallel rays) appears smaller and brighter than the screen aperture itself, while at other distances it becomes diffuse or its centre even darkened. This paragraph (pp. 68, 69) reads as follows:—

"Reverting to the case in which light from a luminous point passes through a circular aperture, and is received on a screen beyond, consider the brightness at a point just in the axis on the receiving screen. If the relation between the two distances, already so often mentioned, and the diameter of the hole be such that the sum of the distances from the luminous point to the edge of the hole, and thence to the central point on the receiving screen, exceeds the direct distance from the luminous point to the latter by just half a wave's length, theory shows that the illumination is actually four times as great as if the screen in which the hole is pierced were taken away altogether. Suppose, now, the hole be enlarged. We might have said at first sight, supposing we were ignorant of the theory: 'Of course, that must increase the illumination at the

* Macmillan & Co., London, 1887.

central point, or, at any rate, cannot diminish it.' On the contrary, it does diminish it; and, if the hole be enlarged till its area is just double what it was in the first instance, the centre of the illuminated space on the screen is a black spot. This theoretical result is easily realised in experiment; only, as the wave-length varies from colour to colour, and the proper distance of the receiving screen varies with the wave-length, when the screen is in adjustment for the brightest part of the spectrum, it is not quite in adjustment for the fainter ends, so that the spot, instead of being perfectly black, is faintly purple."

It has been the writer's practice to expose for the shadows with a small circular diaphragm aperture, the screen distance being such as to give the smallest and brightest image of this aperture upon the sensitive plate, and to expose for the high lights with a diaphragm aperture of several times' greater diameter. In this way a sharp, fine dot is always obtained in the shadows, even when the high lights have to be closed up by a supplementary exposure with a large diaphragm exposure.

It is evident, then, that, although the modern screen process was brought to its present degree of perfection on the basis of the pinhole image theory (a good working hypothesis), diffraction really plays an important part, actually improving the "pinhole image," or injuring, or almost destroying it, as the conditions are made favourable or unfavourable.

F. E. Ives.

AN EXPOSURE TABLE.

By the kindness of an old friend of this Journal, Mr. J. A. Forrest, of Liverpool, we have had placed before us an exposure table for Ilford ordinary plates, which Mr. Saunders, a member of the Liverpool Amateur Photographic Association, has worked out. The table gives the result of a year's work, and the principal factors that entered into Mr. Saunders's calculation were: time of day; subject, the range being from sky and sea to a badly lighted interior, estimated as 1 : 18,000; the light, divided off into sunlight, obscured, cloudy, and dull; and lens aperture.

Mr. Saunders's remarks of the table: "This table has been prepared with a view of providing a guide for the amateur photographer in making exposures, which, if mixed with a few grains of common sense, should prove useful.

"The table is based upon actual practice, and is a mean result of the best negative taken at various times, and under varying conditions, throughout twelve months, the exposures of which were carefully noted, and which, generally speaking, proved to be correct.

"The relative intensity of light as given in the table is upon the authority of Dr. Scott, the plates used are the Ilford ordinary.

"A constant figure has been obtained for a correct exposure which appears to be 16, and is found as follows:—

"The exposure which produced a good negative of an open landscape taken at 3 p.m. in the month of September, with the sun obscured and the stop at *f*-32, was 4 seconds.

"The relative values under these circumstances are:—

Example I.

2 for the time of day = A on table.
4 ,, subject = B ,,
2 ,, sun obscured = C ,,
4 ,, 32 stop used = D ,,

then $\frac{A \times B \times C \times D}{\text{exposure}} = \frac{2 \times 4 \times 2 \times 4}{4} = 16$

and therefore by transposing that

2
4
8
2
16
4
4)64
16

Example II.

$$\frac{A \times B \times C \times D}{16} = \text{Exposure.}$$

Say we require the exposure for a landscape and foreground on a bright day in October at 10 a.m. with a stop of *f*-32—

then $\frac{A \times B \times C \times D}{16} = \frac{3 \times \cancel{5} \times 1 \times \cancel{1}}{\cancel{16}} = 7\frac{1}{2}$ seconds.

3
10
30
4
16)120
$7\frac{1}{2}$

"It must be clearly understood that the exposures given may not be absolutely correct under all conditions, for reasons that we may never get the light twice alike, also differences in lenses, plates, &c.; but the figures given may be considered a fair average, and the table must be used judiciously until, by sufficient practical experience, the amateur is able to judge of the correct exposure by the appearance of the image upon the focussing screen."

The data given will enable the reader to judge of the nature of the table, the enormous number of figures in which preclude its reproduction. Mr. Saunders's method of arriving at a constant figure for a correct exposure, as illustrated by Examples I. and II., though derivable from constant working with a given brand of plates, is, doubtless, susceptible of adoption under like conditions with other brands of plates. The table is certainly interesting by reason of the fact that it is based upon actual observation and practical work.

RUDOLPH'S NEW LENS.

Dr. Rudolph, of Jena, has invented a lens which, while having a great intensity of light, and, over a wide field of view, being well corrected as to astigmatism (that is to say, producing an astigmatically flattened image), meets even exceptional requirements, as regards chromatic and spherical correction. This object is attained by rendering the principle of correction, embodied in Gauss's telescope objective, serviceable for the purposes of the present invention.

Fig. 1 represents the telescope objective of Gauss.

Fig. 2 represents an objective constructed according to the present invention.

Fig. 3 represents a double objective composed of two object-lenses of the improved kind.

As is well known, says Dr. Rudolph, Gauss has demonstrated that a double-lens objective enables both chromatic and spherical aberration to be corrected with great accuracy for a comparatively large aperture, if such compound object-lens be constructed as illustrated in the section,

Fig. 1.



Fig. 2.

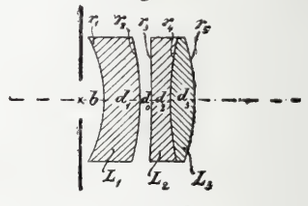


Fig. 3.

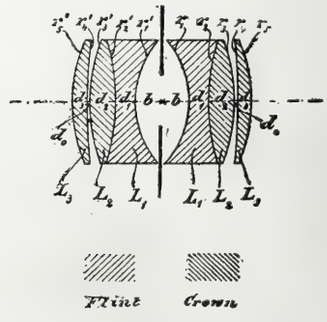


fig. 1, of the accompanying drawing, that is if it consists of a convex crown glass meniscus, A, and a convexo-concave flint-glass lens, B, the two surfaces whereof which are turned towards each other are separated by air differing materially in their curvatures, so that they may not be cemented together. Unlike the types of object-glasses of Fraunhofer, Littrow and others, in which the faces, turned towards each other, have practically equal curvatures, and are generally cemented together, the type of objective devised by Gauss is liable to undergo, on the basis of a proper distribution or arrangement of the curvatures, a correction of the spherical aberration for two different colours, so that the so-called "chromatic" difference of the spherical aberration is done away with, and both aberrations are effaced over an area corresponding to a large aperture. Objectives of this description have been repeatedly and successfully applied to astronomical telescopes, both the arrangements of

enses, that are practicable, *viz.*, crown first and flint first, having been ried. But, before the present invention, no advantageous application f this type of compound lens to photographic objectives has, to my nowledge, been either made or deemed feasible. Such application is ttained, in the first place, by imparting to Gauss's objective the property f producing an anastigmatically flattened image—which is so desirable or photographic lens systems, but has hitherto not been realised in the aid objective—and, secondly, by achromatising such anastigmatic objective in a novel manner, satisfactory for photographic purposes. In ttempting to attain this result, considerable difficulty has been experienced owing to the narrow range of suitable sorts of glass. It has been found that, in an objective of great aperture, a perfect anastigmatic latness of the image may be secured only with lenses either of considerable thickness or placed at a great distance apart. Furthermore, a sufficient chromatic correction—while being attainable with any given pair of crown and flint glass in the astronomical objective, which need not produce an anastigmatically flattened image, and which has hitherto been constructed with lenses of but little thickness, and placed at a short distance from each other—in an anastigmatic objective, of a comparatively large aperture, may be ensured only where the dispersive power of the flint glass (as expressed by the formula $\frac{\Delta\ n}{n-1}$) has a comparatively great value, viz., about double the value of the dispersive power of the crown glass. Such a pair of lenses, however, is unsuited for photographic purposes, inasmuch as it would have to comprise a very heavy flint glass.

According to the present invention, this drawback is obviated in the following manner: In the lens system (shown in fig. 1) either one lens, A, or the other lens, B, or both, consist each of a positive (biconvex) lens and of a negative (biconcave) lens cemented to the first, and formed of glass, having the same or nearly the same refractive power as the glass of the positive component but different dispersive power.

A lens so composed will, as regards all the effects dependent upon refraction (*viz.*, focal length, the location of the cardinal points and spherical aberration of every description) be exactly identical with a single homogeneous lens of like external curvatures and equal thickness, while as regards chromatic dispersion, the compound lens is equivalent to a single lens with like curvatures and of a like thickness, but made of glass, having a dispersive power differing from those which actually occur in either part of the combination. In particular, the resulting dispersive power of the compound lens is less than the least dispersive power of the component lenses—that is to say, the compound lens is achromatic or partially achromatic—if in the case of the compound lens being a positive lens, A, the positive component, and in the case of it being a negative lens, B, the negative component consists of glass of less dispersive power; and the resulting dispersive power of the compound lens is greater than that of either component—that is to say, the compound lens is hyperchromatic—if in the case of the compound lens being a negative lens, B, the positive component is formed of glass of less dispersive power, and the negative component of glass of greater dispersive power. The former fact agrees with the well-known rules of achromatisation of lenses, and the latter with the demonstrations respecting hyperchromatic dispersing lenses, contained in the Specification of my Patent, No. 12,219, of 1896. The value of the resulting dispersive power of the compound lens in all these cases depends upon the values of the dispersive power of the glasses employed in forming the two components and upon the ratio of the total curvatures or of the focal length of both components; it depends consequently, if the outer curvatures of the compound lens are given upon the radius of curvature common to the inner surfaces united by cement. Such value may therefore be calculated in each individual case by means of well-known formulæ.

By the stated manner of composing the lenses, A and B, of a lens system of the Gauss type every required ratio of their dispersive powers may be realised, without causing the lenses to differ from non-composite lenses of glass of the same thickness and outer curvatures, as regards the effect of refraction and the spherical aberrations by which refraction is attended. The outer curvatures and thicknesses of the lenses, A and B, may therefore be determined beforehand, regardless of the dispersive powers of the particular kinds of glass to be employed, but in view to produce the correction of spherical aberration, and to anastigmatically flatten the field of the image, and subsequently, by properly determining the inner radius of curvature of the components to be cemented of lens A or of lens B, or of both lenses, the ratio of the resulting dispersing powers of the lenses A and B, which is requisite for the proper correction of chromatic aberrations, may be easily established. In the practice of this method values of the said ratio result, which in the case of non-composite lenses could only be obtained by employing a flint glass of a very high dispersive power, but which, with the lenses constructed as above explained, are induced by crown and flint glasses, exhibiting but slightly different dispersive powers, provided such glasses possess an equal, or approximately equal, refractive power.

Pairs of glasses, which meet these requirements, in sufficient range of radiations form part of the kinds of optical glass which are constantly for sale at the Jena Glass Works. The condition of identical refractive power need only, of course, be fulfilled approximately, inasmuch as slight differences in the indices of refraction between the cemented components, even where the curvature of the inner surface is very marked, influence the corrections, but to an extent which is comparatively insignificant, and may be easily introduced into the computations. Indeed, a little difference in the refractive power, say a few units in the third place after the decimal point, may even prove advantageous, since, owing to such a difference, a more perfect equalisation of the so-called "zones" of the spherical aberration may become feasible.

Apart from this, no essential variation, or departure from principle, is involved in the construction of object pieces of the new type, should some medium other than air be interposed between the constituent parts of such object piece, the one important condition being that such separating (or spacing) medium, should possess an uncommonly small exponent index of refraction, in comparison with the exponents of the different kinds of glass employed.

The objective producing an anastigmatically flattened image as herein described should, preferably, be corrected by placing the diaphragm in front of the objective, as illustrated, by way of example, in fig. 2 of the drawings. But it will still display a noticeable "coma," and, like any anastigmatic objective with the diaphragm in front of it, it will be attended with the defect of orthoscopic distortion of the image. These two drawbacks may, without difficulty, be obviated, however, by constructing a double object-glass (with a central or intermediate diaphragm), the objective hereinbefore described being utilised as one of the constituent elements thereof. An example of this modified form of the improved object-lens is given in fig. 3.

In the following examples, given by way of illustration of some forms of the new objective, represented in figs. 2 and 3, I have introduced the following symbols:—

The letters r_1, r_2, r_3, r_4, r_5, designate the radii of the spherical ground lens-surfaces; d_1, d_2, d_3, are the central thicknesses of the lenses; b indicates the central distance between the diaphragm and the lens, d_0 the central distance between the main parts of the lens system, L_1, L_2 L_3, the lenses themselves, and D, the diameter of the lenses. In the following tables radii, thicknesses, and diameter of the lenses are expressed in relative numbers, the focal length of the complete object-piece being taken as a unit. By simply multiplying these numbers by the focal length required in any given case, the dimensions of an objective, possessing the requisite focal length, will be found.

In order to characterise the different sorts of glass employed, there are given the refractive indices, n_D and $n_G{}^1$, relating respectively to the D line of the solar spectrum and to the H γ line of the hydrogen spectrum. Besides, for each kind of glass, the value of the dispersive power $\left(\frac{\Delta\ n}{n-1}\right)$ is mentioned, $\Delta\ n$ being calculated for the interval between D and H—γ, while for n the value n_D is adopted.

Example I.

An astigmatically, spherically, and chromatically corrected object-lens with a front diaphragm as shown in fig. 2. The relative aperture of the objective is equal to one ninth of the focal length. The objective consists of two components separated from each other by air, the negative component being a single lens, L_1, while the positive part is made up of a dispersing lens, L_2, and of a collecting lens, L_3, both cemented together. The refractive indices of both sorts of glass employed in making the lenses, L_2 and L_3, are approximately equal, while the glass of which the lens, L_2, is formed is the one possessing the higher dispersive power of the two.

Dimensions for a focal length = 1
Maximum relative aperture = ·111

Radii:		Thicknesses and Distances.	
r_1 =	— ·1164	d_1 =	·0320
r_2 =	— ·2215	d_2 =	·0172
r_3 =	— 1·6097	d_3 =	·0222
r_4 =	+ ·2708	d_0 =	·0086
r_5 =	— ·1760	b =	·0197

Description of Glass.

	n_D	$n_G{}^1$	$\frac{\Delta\ n}{n-1}$
L_1 :	1,57210	1,58997	·03124
L_2 :	1,51158	1,52344	·02318
L_3 :	1,51111	1,52127	·01988

Example II.

An astigmatically, spherically, and chromatically corrected doublet objective with an intermediate diaphragm, shown in fig. 3. Relative aperture $\frac{1}{4}$. The objective is constructed symmetrically in relation to the intermediate diaphragm, each part consisting of two pieces separated from each other by air, the positive piece consisting of the single lens L_3, while the negative piece is made up of the positive lens, L_2 and of the negative lens L_1, cemented thereto, the refractive indices of L_2

and L_1 being approximately equal, but L_1 having the higher dispersive power.

Dimensions for a focal length = 1
Maximum relative aperture = ·25.

Radii:					Thickness and Distances.		
r_1	= −	r_1^1	= −	·1954	d_1	=	·0411
r_2	= −	r_2^1	= +	·4370	d_2	=	·0514
r_3	= −	r_3^1	= −	·3599	d_3	=	·0308
r_4	= −	r_4^1	= −	1·5424	d_0	=	·0026
r_5	= −	r_5^1	= −	·3147	b	=	·0514

Descriptions of Glass.

	n_D	n_G^1	$\frac{\Delta n}{n-1}$
L_1 :	1·57631	1·59227	·02769
L_2 = L_3 :	1·57244	1·58512	·02215

THE PRINTERS', STATIONERS', FINE-ART PUBLISHERS', &c., EXHIBITION.

Only a few years ago the connexion between the printing press and photography was as remote as well could be; but to-day, when the action of light or electricity, or of both combined, is constantly called upon to do those things which used to be done by handicraft, it is quite in the order of nature that in an exhibition of printing, and its allied industries, photography should be accorded a prominent position. The Directors of the Printers', Papermakers', Stationers', Photographers', Fine-art Publishers', and Bookbinders' Exhibition, which was open at the Royal Agricultural Hall, Islington, from June 23 to 30 last, therefore naturally made photography a feature of the show; but they deserve the compliments as well as the thanks of the photographic community for the thorough way in which the Photographic Section of the Exhibition was organized and arranged. No pains seem to have been spared to make the photographic section a success; and, although the period of the year, and this year in particular, was almost the worst that could be chosen for the purpose of holding a photographic exhibition, the result was not only creditable, but praiseworthy; indeed, it would be but a poor compliment to say that it was the best photographic Exhibition that has been held in the Agricultural Hall.

We believe the Printers' Exhibition is to be an annual institution. Next year it will have a formidable rival, as far as photography is concerned, in the Exhibition to be held by the Royal Photographic Society at the Crystal Palace; but we hope the Directors will not be deterred on that account from continuing to make a photographic section a leading feature of their Exhibition. The bond of union between the printer and the photographer has now become so close, that printing and photography are a natural association; and, as time goes on, the connexion will be a closer one. It was interesting to notice that, in the Exhibition under review, had there been no section specially devoted to photography, photography would still have been well represented. Among the exhibitors' stands, we were constantly reminded of the important part photography plays in the pictorial work of the press of to-day. In many cases the exhibits, though the actual result was that of a press, were entirely dependent upon photography for the possibility of their production; in others, the camera had been the means of doing more cheaply and better the work that formerly required the highest class of handwork to accomplish. The printer of to-day whose business lies in the way of the production of pictorial work, although he classes himself as a printer, and not as a photographer, is almost as much dependent upon photography as the photographer himself.

In the Photographic Section, a valuable opportunity for studying what has been done and is doing in process work was afforded by the collection of photo-mechanical work illustrating the present position of photographic processes in illustrative work, and including, for comparison, some examples of the earlier efforts in this direction, brought together and arranged by the editors of the *Photogram*. Among the processes represented were half-tone work, zincography, collotype, Woodburytype, photogravure, and various methods of colour printing in which photography plays a part, photo-chromo-lithography, and bromide printing in which mechanical arrangements had been employed for the rapid production of the prints. The collection had its value increased by the exhibition of printing blocks by various processes, both ready for the press and in the various stages of their production.

Messrs. W. H. Ward & Co., of Charing Cross-road, showed a collection of photographic reproductions, in platinotype and half-tone, of the works of F. Sandys, made for the editor of the *Artist*, well worthy of careful study by those interested in the reproduction of works of art.

Messrs. Raithby, Lawrence, & Co. exhibited various examples of their work, of great interest to the printer. The examples showing the different effects produced by printing half-tone blocks on various kinds of paper deserved careful inspection by those who do not make a specialty of printing of the kind, for there was a great deal to be learnt from them.

Among the firms exhibiting photographic work were Messrs. Morgan & Kidd, C. W. Faulkner & Co., Husnik & Hänsler, Washington, Kell, & Co., Howard & Jones, the Art Reproduction Co., and the London Etching Co.

The entry of photographs in the competitive classes was not a very large one, as might be expected, but the pictures, which numbered about two hundred, were excellent in quality, and among them were very few indeed that could not be classed as good works. Ample space was allowed, the arrangement on the walls was good, and they constituted a very pretty and interesting general photographic exhibition.

We must not omit to mention the loan collection of photographs, which included pictures by many of the leading photographic workers of the day, brought together and lent for exhibition by Mr. A. Horsley Hinton, and the collection of lantern slides lent for exhibition by Messrs. G. Francis Clarke, J. Carpenter, F. P. Cembrano, jun., J. H. Gear, G. Hankins, H. M. Hastings, J. A. Hodges, Edgar G. Lee, Paul Martin, C. H. Oakden, W. Taverner, and the Editors of the *Photographic News*, the *Amateur Photographer*, and *Photography*. These were shown at intervals during the day and evening in the optical lantern, under the superintendence of Mr. R. R. Beard, and probably constituted the finest collection of photographic lantern slides that has ever been brought together. Demonstrations of the X rays were given by Messrs. A. Hirs & Co. at frequent intervals, and Messrs. Newman & Guardia entertained large audiences by their display of animated photographs.

The Judges were Messrs. T. Bedding, F.R.P.S., E. J. Wall, F.R.P.S. and H. Snowden Ward, F.R.P.S. Their awards were:—

Class A (Champion Class).—Gold medal, J. H. Gear.

Class B (Portraiture).—Silver medal, T. Lee Syms; bronze medal F. Birch; certificate, G. J. Martyn.

Class C (Figure Studies), *Genre*, &c.).—Silver medal, W. Howell bronze medal, A. Hands; certificate, T. Lee Syms.

Class D (Landscape or Seascape).—Silver medal, A. J. Jeffreys; bronz medal, F. A. Bolton; certificate, W. Rawlings.

Class E (Architecture).—Silver medal, J. Bulbeck & Co.; bronze medal B. Lyon.

Class F (Artificial Light Photography).—Award withheld.

Class G (Enlargements).—Silver medal, R. S. Webster; bronze medal S. H. Fry.

Class H (Beginners Class).—Silver medal, H. Grocock; bronze medal H. V. Hyde; extra bronze medal, H. W. R. Child.

Class J (Lantern Slides).—Silver medal, Paul Martin; bronze medal W. H. Pugh.

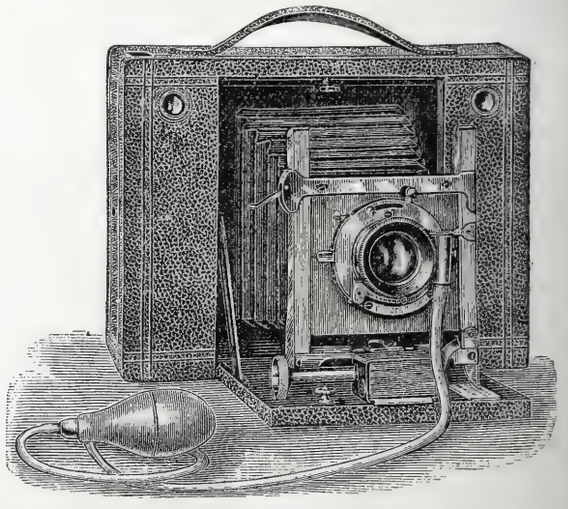
Class K (Finishing in Black and White on Enlarged Portrait).—Silve medal for exhibit, H. Flatter.

Our Editorial Table.

The No. 4 Cartridge Kodak.

The Eastman Photographic Materials Co., 115, Oxford-street, W.

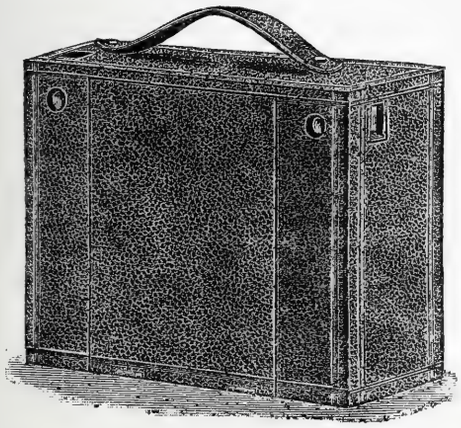
This, one of the latest forms of the Kodak series, has been design as a moderate-priced, high-class folding camera, suitable for vario classes of work. When folded, it is only $3\frac{1}{8}$ inches in thickne and, being easy to carry, is adapted for attachment to cycles.



takes rectangular 5×4 pictures; has a capacity of 12 exposu without reloading; the size of camera is $3\frac{1}{8} \times 6\frac{3}{8} \times 8\frac{1}{4} = 167$ cu inches; the weight, when loaded, 2 lbs. 12 ozs.; and the length f focus of the lens) $6\frac{1}{2}$ inches.

The No. 4 Cartridge Kodak takes either daylight loading f cartridges or glass plates, is fitted with a rapid rectilinear lens a

pneumatic release shutter with iris diaphragm stops. This shutter has three speeds for instantaneous exposures; it makes short-time exposures by one pressure of the bulb, the shutter closing when the bulb is released, and makes longer time exposures by pressing the bulb once to open the shutter and again to close it. It may be operated by the finger trigger instead of the bulb when so desired.



The camera is also provided with a rising, sliding, and falling front, two view-finders, one for vertical and one for horizontal exposures, two sockets for tripod screws, and may be used either as a hand or tripod camera. It has an index for focussing, and when used with plates may be focussed on the ground glass if desired. The plate adapter can be put in place or removed in five seconds, and, when used with film, there are no projecting parts.

A Magnesium Substitute.

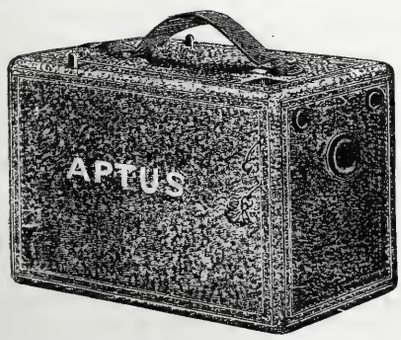
B. Ullmann & Co., 10, Coleman-street

From Messrs. Ullmann & Co., we have received a sample of a compound which they term "magnesium substitute" for photographic flashlight purposes. It appears to be an aluminium preparation in a very fine state of division. The substitute burns brilliantly, and is excellently adapted for the purpose. We may remark that the whole subject of the comparative properties of flashlight compounds is one which would well repay experiment.

The "Aptus" Magazine Hand Camera.

Sharp & Hitchmough, Dale-street, Liverpool.

We have been shown several photographs taken in the Aptus Magazine Hand Camera, with the lens at the full aperture, *f*-11, and the excellence of definition is so conspicuous that the camera could not have a better testimonial to its efficiency. It is, moreover, extremely simple to work, the sheaths being easily and certainly changed by a simple side-to-side movement on the top of the camera.



The lens, as we have hinted, is of very good quality. The camera is fitted with an automatic indicator; two finders, for vertical and horizontal pictures; iris diaphragms, working in front of the lens and controlled from outside the camera; time and instantaneous shutter; while the twelve sheaths take either as many plates, or twenty-four films. It is altogether exceptionally good value for the priced charged—30*s*.

Half-tone and Colour Engravings is the title of an exquisitely printed little brochure issued by the Cranford Press, Chiswick, in which half-tone, in monochrome and three colours, is eulogised and illustrated.

The Gazelle Extra-rapid Dry-collodion Plate.

Manufactured by the Birmingham Collodion Plate Company, Yardley Fields, Birmingham.

In sending us a sample of their new "Gazelle" dry-collodion plate, the Birmingham Collodion Plate Company remark:—

"This plate possesses all the qualities, such as absence of grain, cleanliness, density, &c., of our other brands of plates, and is about four times more sensitive than the Eagle. We venture to think that this plate will become very popular with professional photographers for portraiture, as it has several advantages. Firstly, it produces results full of modelling and gradation; secondly, the rapidity with which the negative is made; and, thirdly, the negative may be printed from in one-third or fourth the time which is taken by a gelatine negative. It has taken us many years to perfect this collodion plate of extreme sensitiveness."

We were much pleased with our trial of the plates, which, with metol-soda development, yielded us brilliant and grainless images, of extreme richness. We were astonished at the facility with which density was obtainable without resort to intensification. The plates, compared with others of known rapidity, are very rapid, and we have no doubt that many photographers will appreciate them. Let us remind modern photographers who may try these plates that a collodion film requires much more careful handling than one of gelatine.

Mawson and Swan's Orthochromatised Plates.

Mawson & Swan, Soho-square.

Orthochromatic photography should command increased attention now that so many firms are taking up the manufacture of colour-sensitive plates, and it may be safely conjectured that the productions of Messrs. Mawson & Swan in this particular field will speedily achieve a degree of favour not inferior to that enjoyed by their other specialities. We have had the opportunity of trying some of their recently introduced orthochromatised plates. The subject we chose was a coloured picture prepared as a test-object with special inks, and the resulting negatives proved that the plates possessed the property of correctly translating colour values to a remarkable degree, the reds in particular being well rendered. We congratulate Messrs. Mawson & Swan on their latest introduction.

Catalogues Received.

Thorne & Hoddle, 169, Camberwell New-road, S.E.

Catalogue of Incanto acetylene generators for photographic and other purposes.

Taylor, Taylor, & Hobson, Slafe-street Works, Leicester.

Catalogue of photographic lenses, &c. This, the fifteenth edition of Messrs. Taylor's well-known catalogue, has some useful notes on the principles of a lens action; the preservation of lenses; and how to focus.

Baxter & Wray, Borough Mills, Bradford.

Price-list of films, cinematographs, cameras, &c. Those interested in animatography will find this catalogue serviceable, apparatus for the purpose being listed. Some hundreds of subjects are included among the list of positive films.

News and Notes.

Messrs. L. Trapp & Co. have removed to larger and more convenient premises at 29, Budge-row, E.C.

The Velograph Syndicate, of 242, London-road, Croydon, send us some specimen strips of animated photographs of the principal parts of the Jubilee procession. The pictures are of great excellence.

Mr. J. Fuerst (Fuerst Brothers, Philpot-lane, E.C.) informs us that he took a successful series of Jubilee animated photographs with the Lumière cinematograph. These films will shortly be ready for sale.

"I want a poster got out," said the commercial gentleman. "Certainly," said the artist. "I get them up on three systems—the opium, the lobster-and-ice-cream supper, and the Welsh rarebit. Which will you have?"—*Indianapolis Journal.*

Mr. H. S. Nichols will shortly publish a photographic facsimile of the *Rubaiyat* in the Bodleian Library, from which Edward Fitzgerald made his earliest studies of the subject. The photographs will be accompanied by a transcript of the manuscript into modern Persian type, and by a literal translation and copious notes by Mr. Edward Heron-Allen.

THE death of a photographer from sunstroke is reported from Taunton. The deceased was Walter George Petherick, son of Mr. A. G. Petherick, photographer. He was stricken while engaged in taking photographs five weeks ago. He lingered in great pain until last week, when he succumbed.

RENDERING OLD MANUSCRIPTS LEGIBLE.—The authorities of the city of Breslau recently consulted the chemists of the University respecting some old manuscripts of the sixteenth century, which damp and old age had made quite illegible in some parts. A remedy was very easily found. It was ascertained that gall-nut ink had been used, as had been expected. When painted with a one per cent. alcoholic solution of tannic acid, the characters became already fairly discernible; ammonium sulphide brought them out again in full distinctness.

A REVIVAL OF THE STOURBRIDGE LENS INDUSTRY.—Although the old branch of the Stourbridge glass trade has been numbed by adverse circumstances, new ground has been broken in the town by the British Lens and Glass Company, Limited, who, after some six months spent in renovating and adapting the old Coalbourne Hill Glassworks, are now putting on the market various kinds of glass for entirely novel purposes. One important part of the Company's business is the manufacture of lenses for marine use, photography, railway, and other purposes.

THE BIRMINGHAM JUBILEE PROCESSION.—Mr. H. J. Whitlock, photographer, of 11, New-street, has just completed a series of ten beautifully finished photographs of the Birmingham Jubilee procession, a series which will constitute a worthy souvenir of a brilliant occasion. From his premises opposite King Edward's School, Mr. Whitlock has succeeded in catching some happy and wonderfully vivid glimpses of the various sections of the pageant. The athletic groups, in particular, are caught at a capital time, the occupants in one car just having reached the most interesting part of their performance. The water-car tableau also comes out with marvellous distinctness, and all through the camera has done its duty with wonderful regard for, and fidelity to, the smallest details. Any one who doubts the size and enthusiasm of the crowd need only to take a glance at these almost-living representations to be convinced. There is hardly a face in the vast and constantly changing crowd that will not be recognised by some one. The series form a memorable record, which will evoke from lovers of the photographic art, as well as from the general public, unstinted admiration.

THE METRIC SYSTEM OF WEIGHTS AND MEASURES.—The following is the text of the Bill which has been introduced in the House of Commons to legalise the use of weights and measures of the metric system: Notwithstanding anything in the Weights and Measures Act, 1878, the use of a weight or measure of the metric system in trade shall be lawful, and nothing in Section 19 of that Act shall make void any contract, bargain, sale, or dealing by reason only of its being made or had according to weights and measures of the metric system, and a person using or having in his possession a weight or measure of the metric system shall not by reason thereof be liable to any fine. The Board of Trade standards which may be made under Section 8 of the Weights and Measures Act, 1878, shall include metric standards derived from the standard metre and standard kilogramme deposited with the Board of Trade. It shall be lawful for the Queen by Order in Council to make a table of metric equivalents in substitution for the table in Part I. of the third schedule to the Weights and Measures Act, 1878, and as from the date at which the Order in Council comes into operation, Part I. of the said schedule and sections 18 and 38 of the said Act shall be repealed.

THE WASHINGTON MONUMENT'S SEISMOSCOPE.—The largest seismoscope in the world hangs through the centre of gravity in that great obelisk which was erected at Washington. This instrument consists of a copper wire 174 feet long, which holds a plummet suspended from its lower extremity into a vessel of water. Two transits arranged at right angles to each other are focussed upon the wire just above the plummet, and by means of these little telescopes the slightest vibration of this great mass of stone is indicated upon a graduated scale. The expansion of the monument's south face, on a hot summer day, sometimes shifts the apex northward a few hundredths of an inch, and high winds frequently cause a slight variation from the normal position of the wire. Occasionally the plummet swings violently when the weather is calm and cool, its motion under such circumstances being ascribed to vibration of the earth itself. The custodian of the monument takes a daily statement of the transits, and prepares a monthly chart of the same, which is filed in the War Department. An examination of these records discloses the interesting fact that no permanent change has been effected in the position of the monument, the plummet having always leaned toward its normal resting-place when the causes of disturbance subsided.

EXTRACTION AND PREPARATION OF TALC.—Talc is extracted on a large scale from the granite mountain of St. Barthelemy, in the French Department of Arriège, about thirty-two kilometres (twenty miles) from the main chain of the Pyrenees. The principal quarry, at Tremouin, is worked open-cast in three banks or terraces, each about fifteen metres (forty-nine feet) high. The best rock is of a bright, white tint, and feels greasy to the touch when reduced to fine powder. The quarried rock is brought by a tramway to the end of the quarry in the Axiat Valley, and then by waggons for a distance of nineteen kilometres (eleven miles) to Luzenac, where ninety-horse water power is taken from the Arriège river. The mechanical preparation consists of drying in a rotary oven, breaking up small, grinding and sifting, the grinding being effected in mills with steel balls. The larger portion of the product, observes an Ingénieur des Arts et Manufactures, who has communicated these particulars to the *Chronique Industrielle*, is converted into powder, only a small portion being sent away in the rough state, or cut into pencils for writing on metals. Besides its use throughout most parts of Europe and America, in soap and paper-making, talc enters into the composition of waggon-axle grease, while it also serves as an insulator for electric conductors.

NEW COMPANIES.—Edisonia, Limited. This Company has been registered by Mr. E. Lloyd, of 23, Wormwood-street, E.C., with a capital of 40,000*l.*, in 5*l.* shares, of which 4000 are six per cent. preference (cumulative). The objects of the Company are: To acquire the licence granted to Mr. James E. Hough by the Edison-Bell Phonograph Corporation, Limited, and to enter into a certain agreement, and to manufacture, sell, and deal in, phonographs, graphophones, cylinders, and electrical, photographic, and scientific instruments. The first Directors (to number not less than three nor more than seven) are to be nominated by the subscribers. Qualification, 1000*l.*; remuneration, 500*l.* per annum, divided between them. Mr. James E. Hough is the Managing Director, his remuneration being 500*l.* per annum.—Fortescue Wetherman & Company, Limited. This Company has been registered, with a capital of 1000*l.*, in 1*l.* shares, by Messrs. Leonard & Pulditch, of 57, New Broad-street, London, E.C. The objects of this Company are: To enter into an agreement with Mr. Fortescue Wetherman for the acquisition of the business carried on by him at Chase Side, Enfield, N., as "Fortescue Wetherman & Co.," and to carry on the business of printers, photographers, lithographers, etchers, &c. The vendor is the Chairman and sole Managing Director. Registered office, Chase Side, Enfield, N.

COUNTESSES AND CAMERA.—At Epsom County Court, on Saturday last, Messrs. Chard & Co., photographers, of Great Portland-street, London, sued the Countess R. Sztaray, and her daughter, for 50*l.* damages, alleged to have been suffered by the defendants overturning and destroying a photographic camera, negatives, &c., on April 28. Mr. H. V. Tovey, plaintiffs' operator, also sued for 10*l.* damages for alleged assault and battery. Mr. A. W. Sell was for the plaintiffs, and Mr. A. Powell for the defendants. It was agreed that his Honour should first decide the question of liability, damages being left over until that had been settled. It was stated that the plaintiffs made arrangements with the manager of the Epsom Downs Hotel to take photographs of the spring races for animated photography, and that they paid 7*s.* for two seats on the balcony of the hotel. After photographing some incidents, the countesses went up, it was alleged, and the daughter, in a peremptory manner, asked if he was going to stay all day. Mr. Tovey said he presumed he might do so under the circumstances, at which the two ladies were much put out. The elder one retorted that she was in the habit of walking where she pleased, and that, if he remained, she should report him to the manageress. Subsequently she stated that, if the camera came in her way she should push it over. Later on she asked if she could pass, and she was allowed to do so, the camera being moved for her. As Mr. Tovey was busy in taking photographs of the finish of a race, the countess again went up and said she must pass. She was asked to wait a minute, and, calling to her daughter, she said Mr. Tovey would not let her pass. "Push it over," cried the daughter, who, going up, caught hold of the assistant, pushed him on one side, and said, "We will see about that." The daughter then seized one of the tripods, and gave the operator a serious blow in the eye with the camera. Mr. Tovey was unable to go on with his work, as the heavy box on the camera was strained, and the negatives were useless owing to the light getting to the films. The operator had a black eye, and there was a cut which would be a permanent disfigurement. The camera was worth about 100*l.* For the defence, it was urged that Mr. Tovey was told by the manager that he might go on the balcony if he would undertake not to get in the way of other people. No one in any circumstances could have passed the camera in the position in which it was placed. It was admitted that the daughter took hold of the camera, and that it caught Mr. Tovey in the eye and caused "one drop" of blood to trickle down his cheek. Mr. Powell contended that the ladies were entitled to remove a nuisance, as this amounted to. The case was adjourned to the July Court, his Honour advising the parties to try to come to some settlement.

THE *Daily Chronicle* asks if future travellers will have occasion to curse or to bless the ingenuity of M. Pallain, head of the French Customs, who has enlisted the Röntgen rays into the service of his department. It is well known that, apart from their influence on sensitised photographic paper, the rays, when directed against a fluorescent plate, produce a luminous picture visible at once to the naked eye. This property M. Pallain employs for frustrating the designs of smugglers. His apparatus consists of a "kind of enlarged spectroscope," fitted with lenses through which the official peeps at one end, whilst the other extremity is big enough to hold a trunk or portmanteau. The object to be examined is placed between a Crookes' tube and a fluorescent plate, with the result that its contents are at once revealed without unlocking the lid or even removing an outer wrapper. M. Pallain proposes to apply his method at once to postal parcels only, so the conveyers of illicit cigars and contraband lace may still enjoy a brief respite. With reference to the foregoing, the Paris correspondent of the *Daily Telegraph* says: "Although the experiments made with the famous X rays for the purpose of ascertaining the nature of the contents of boxes and parcels at different railway stations here have been attended with fairly satisfactory results, it is a question whether this system will be generally employed, after all, in the examination of baggage by the Customs officers. In referring to this matter some days ago, I pointed out that it was hoped and believed that this method would realise a considerable saving of time. The contrary, however, would appear to be the case. Whereas three *employés* were able to inspect on an average one hundred trunks in the course of ten minutes, it is estimated that about double that number would be needed to get through the same amount of work with the application of the X rays. Packages have to be placed before a very powerful apparatus, and to be turned and turned about, and, while all this involves more complicated manipulation, much more space is required than before. Then, too, it is found that it is not easy to arrive at a precise idea of the quality, the colour, and the weight of the various tissues submitted to examination, or to determine whether they are new or old. Nor, again, is it possible to discover whether articles of jewellery are of gold or silver, real or imitation, and so on. Therefore, in not a few cases, the Customs officers, after a long inspection, have been obliged to settle the difficulty by opening the boxes. At least the X rays are pronounced useful in the examination of parcels sent by post, which were so rarely opened that some people, who were aware of the fact, seized the opportunity of slipping in cigars and other articles which have to be declared. But, as matters stand at present, it does not seem likely that the inspection of luggage by means of the X rays will be generally adopted in this country."

It was a happy thought of Mr. H. Montague Cooper to offer, in celebration Her Majesty's record reign of sixty years, to take and give, free of charge, a abinet portrait to all applicants resident in the borough of Taunton who were ged sixty and upwards. Many persons applied at his studios in East-street reviously to the date appointed—in some cases successfully—although the ay set apart for that object was Thursday, June 24, this being selected by Ir. Cooper so as not to clash with the festivities of Jubilee Day proper, and enable many to avail themselves of the early closing of the shops. We have announce what must certainly be a record feat in studio portraiture for aunton, if not for the United Kingdom—no less than 311 separate persons eing photographed between the hours of nine a.m. and six p.m. Each one was osed by Mr. Cooper personally, and during the day he used exactly 320 hotographic plates. The first sitter put in an appearance at five minutes to ine, and then there was a constant stream until 12.30, by which time no less lan 126 persons had been photographed. The reception-room was then empty, nabling Mr. Cooper, after three and a half hours' close work, to get some ight rest and much-needed refreshment. At one p.m. there were several new omers, and operations were recommenced and continued without a break ntil 5.15, at which hour 295 sitters had been successfully portrayed. There as then a void until 5.45, but at six o'clock, the hour of closing, the total had eached the great number before stated of 311 entries in the studio register, hich, including groups of two, made a grand total of 322 persons photo- raphed in eight hours' actual work, being forty sitters per hour, or one and a alf minutes for each person. No applicant was refused a free sitting, although Ir. Cooper informs us that he should not consider there were more than four ersons applied who by age were not really entitled to receive the gratuity fered. To go into particulars which will perhaps interest our readers, there ere 119 male and 201 female adult sitters and two children—one a Jubilee aby photographed with its grandmother. 102 persons were betwixt seventy nd eighty years of age, and eighteen of eighty years and upwards, the oldest erson being eighty-seven. Several sitters had not previously been out of their oors for some years, showing, as well as the total, that the gift was duly appre- ated. A few sitters were totally or partially blind, and some, quite helpless, id to be carried to the studio in invalid chairs, though perhaps the greatest indrance to more rapid operations was deafness, this being very prevalent, id with some sitters it necessitated two or more exposures to be made before successful result could be obtained. Lemonade was provided for all who ished it, and Mr. Cooper testifies to the exceeding gratitude that was shown y the sitters as a whole, and also to their orderly conduct and desire to follow ie instructions given them, which alone enabled him to get through the work the day.—*Somerset County Gazette.*

It will be seen that science has been the main factor in rendering possible a omogeneous British Empire of world-wide extent. This very fact, of course, akes the outlook uncertain. Nothing that has been done already could have en foreseen fifty years ago; nothing that may be done fifty years hence can fely be predicted now. Our boasted naval supremacy, upon which so much epends, might be rendered nugatory by the discovery of an effective flying achine, from which dynamite might be dropped upon London. The diffi- ilties of aërial flight, however, do not seem likely soon to be overcome, if er; and, at the worst, we should only be compelled to exchange a marine avy for an aërial navy, and realise Tennyson's forecast of two hostile fleets grappling with each other "in the blue." Danger, if danger there be, would obably come to us from a totally different quarter. We are now learning to legraph to considerable distances without wires, by creating an etheric agita- on at one spot which is picked up by delicate receiving instruments at another. he etheric vibration so set up penetrates material objects as easily as wind ows through a sieve. Probably glass would withstand it, but the hull of a odern ironclad most assuredly would not, and accordingly we are confronted ith this possibility, that a telegraphist sitting at his instrument on sea or land ight at a distance of many miles, far beyond the range of cannon, be able to xplode any gunpowder or dynamite in a vessel's magazines. Such a dis- very, which is quite on the cards, would wholly revolutionise the character warfare, and naturally to our detriment; in fact, electricity, which has done much for us hitherto, could quite easily turn against us by placing power in e hands of the weak. We have already seen some such change in the condi- ons of warfare. In the old days of hand-to-hand fighting it was the big, hysically powerful man who was the better soldier, but a modern rifle is just deadly in the hands of a mannikin as of a giant. Quite conceivably some y the material supremacy of our navy may be brought to nought by new ientific discoveries, either in the directions named or in others at present nsuspected. We can only trust that Englishmen will be equal to the occa- on, and will be able to utilise the new conditions to the utmost. That they ve been able to do hitherto, and, supposing that we in these islands become fete and degenerate, there are the vigorous off-shoots of the old plant growing in the newer regions of the south to carry on the traditions of the race. eanwhile science, especially physical science, from which as a nation we have much both to hope and to fear, is never standing still. In Shoreditch they ve just erected a gigantic "destructor" of refuse, the novel feature of which that the heat generated by the burning of the contents of the waste bins of e district is to be applied to electric lighting. There is nothing revolutionary this experiment, which merely consists in utilising, instead of wasting, a rtain amount of heat; but the principle of letting nothing go to waste is a ry big one, which, with nature's lessons on the subject staring us in the face, have not yet sufficiently turned to account. As nature wastes nothing, why ould we? Heat is a valuable commodity, and look at the immense amount it we waste in the lighting and warming of our private dwellings. When want light, for instance, we treat the heat evolved in producing it as a by- oduct of no valve. With the electric light there is comparatively little heat t, but there are other forms of energy recklessly wasted in connexion with Then think of the energy wasted in stopping trains and vehicles of all scriptions by means of brakes, to mention only one out of a thousand amples of our thriftlessness. How all this leakage of power is to be guarded ainst I do not profess to say; if I knew, I would hie me at once to the Patent fice. But the Shoreditch experiment is an interesting beginning in that line effort.—*The Referee.*

Patent News.

The following applications for Patents were made between June 14 and June 19, 1897:—

Shutter.—No. 14,474. "An Improved Photographic Shutter." H. Tattersall.

Pocket Kinetoscope.—No. 14,563. "The Pocket Kinetoscope, for Exhibiting Life-like Pictures in Book Form." L. E. Wade and R. J. Horsfall.

Cameras.—No. 14,701 "Improvements in Photographic Cameras." R. Krügener.

Cameras.—No. 14,703. "Improvements in Photographic Cameras." Communicated by La Société Demaria Frères. H. H. Lake.

Passepartouts.—No. 14,721. "Improvements in Passepartouts." Complete specification. E. Carraine.

Washers.—No. 14,789. "Improvements in or relating to Plate and Print Washers." A. Pass.

Displaying Photographs.—No. 14,809. "Improvements in or relating to Apparatus or Devices for Displaying Advertisements, Pictures, Photographs, or the like." E. L. Turner.

Photograph Frames.—No. 14,813. "Improvements in Picture Frames." Complete specification. M. Theile.

Camera Backs.—No. 14,823. "Improvement in the Back of Cameras for taking a Separate Photograph on each Half of the Sensitive Plate, Film, or the like." D. K. Whittome.

Acetylene Light.—No. 14,835. "A New or Improved Acetylene Gaslight Apparatus, applicable for use in Photographic Studios for Photographing at Night." G. W. Gaskell and R. F. Reeve.

Animated Photography.—No. 14,861. "Improvements in Apparatus for Taking, Printing, and Projecting Successive Photographic Pictures." C. Stafford-Noble and F. Liddell.

Actinometers.—No. 14,865. "Improvements in Actinometers." Complete specification. G. F. Wynne.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
5	Bradford Photo. Society	*Hand Cameras I have Used.* P. E. Newstead.
5	South London	*Light Filters (Colour Screens), How to Make and Use them.* The President.
6	Aintree	Animal Life.
6	Brixton and Clapham	Members' Open Evening.
6	Gospel Oak	*Lenses, their Properties and Uses.* W. Beyer.
6	Hackney	*A Few Remarks on Toning.* W. A. Hensler.
7	Photographic Club	Open Night.
8	Bradford Camera Club	*Hints on Copying.* Mr. Cowbourn.
8	Oldham	Group to be Taken of Members of the Society.
10	Hackney	Excursion: Moulsey. Leader, The President.
10	Oldham	Excursion: Miller's Dale. Leader, R. T. Taylor.
10	South London	Excursion: Rickmansworth. Leader, A. E. Allen.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 24,—Annual General Meeting,—Mr. W. D. Welford in the chair.

The Hon. Secretary (T. E. Freshwater) read the annual report of the Committee as follows:—

The Committee, in presenting the annual report and balance-sheet to the members, consider under the circumstances that the Association is in a fair position, having a balance of 34*l.* 3*s.* 4*d.* to their credit. There has been a considerable falling-off of members by resignation and removal. This has been met, to a certain extent, by new members, but not quite sufficient to keep up the roll that we used to have; but still we have about 120 members.

During the past year we have been fortunate in having many interesting papers read and practical demonstrations, and the meetings have been very well attended. In the past nine months nearly 1000 members and their friends have attended these meetings; average, twenty-five.

The following papers have been read:—*Under-exposure, and How to Make the Best of it,* Mr. J. E. Hodd. *Over-exposure,* Mr. P. Everitt. *Dark-room Illumination. Photographic Exhibitions and Progress,* Mr. W. D. Welford. *Acetylene Gas,* Mr. C. Hoddle. *Mounting P.O.P.,* Mr. Bayston. *On the Development of Small Films,* Mr. Atkins. *Theory of Development,* Mr. E. Banks. *Flexible Films,* Mr. T. E. H. Bullen. *A Criticism on the Theory of Development as Advanced by Mr. Banks,* Mr. A. Haddon. *Colour Screens,* Mr. E. J. Wall. *Note on Refraction and Dispersion,* Mr. T. Bedding. *Influence of Distance on Exposure,* Mr. E. Howard Farmer. *Transparent Films,* Mr. T. E. H. Bullen. *Demonstration on Light,* Messrs. T. E. Freshwater and E. J. Wall. *The Stigmatic Lens in Use,* Mr. W. E. Debenham.

Caramelene for Backing Plates, Mr. A. Haddon. *Demonstration of Polarised Light*, Mr. T. E. Freshwater. *Carbon Printing*, Mr. G. H. James. *The Artigue Process*, Mr. J. A. Sinclair. *The Colour of the Negative Deposit*, Mr. S. H. Fry. *Negative-making*, Mr. Chapman Jones. *Novitas Transfer Paper*, Mr. Schölzig. *Architectural Photography*, Mr. C. H. Oakden. *Collodio-bromide*, Mr. A. Mackie.

The Lantern-slide Evenings have been very well attended. The following is a summary:—*Ante-Convention Slides*, Mr. Lewis Medland. *London by Gaslight*, Mr. Paul Martin. Dr. Kampfer and Miethe's foreign slides. *Old Lantern Slides*, Messrs. W. D. Welford and T. E. Freshwater. Cinematograph, Mr. Birt Acres. This calls for a special notice, as we had over seventy people in the room to see what was a most successful entertainment.

With reference to the Henderson award, the Judges have not yet settled the question of awards for the papers, *The Slide Competition*. The Judges did not consider that the work sent in was good enough, so they have decided to withhold the prize. The question of prints met with no response, so that the Committee have decided to return to Mr. Henderson that portion of the money he so kindly offered to the Association.

Mr. R. P. Drage, in moving the adoption of the report, thought great credit was due to Mr. Freshwater for the satisfactory condition of the Association, and for the way in which its affairs had been conducted. There had been no lack of papers and demonstrations, and the weekly attandances throughout the year were far from bad. He hoped that Mr. Freshwater would be prepared to continue in the office which during the past nine months he had so efficiently filled.

Mr. A. L. Henderson seconded the motion, and it was carried.

The balance-sheet, duly audited by Messrs. Mundy & Wright, was read, showing an amount of 34*l.* odd to the credit of the Association. It was stated that the expenditure had increased, partly from the extra expense for recording, and from the grant to the Traill Taylor Memorial Fund.

Mr. H. Snowden Ward moved its adoption, stating that it appeared perfectly satisfactory.

Mr. Hill seconded, and, after some discussion, it was carried.

The election of officers for the ensuing year was then proceeded with, Messrs. Everitt and Hill acting as the scrutineers, with the following result:—*Trustees:* Messrs. A. Haddon and J. B. B. Wellington.—*Committee:* Messrs. E. H. Bayston, R. Beckett, R. P. Drage, J. E. Hodd, A. Mackie, E. J. Wall, H. Snowden Ward, W. D. Welford.—*Curator:* Mr. F. B. Grundy.—*Recorder:* Mr. A. W. W. Bartlett.—*Librarian:* Mr. H. C. Rapson.—*Secretary:* Mr. T. E. Freshwater, F.R.M.S.

Mr. Freshwater thanked the Association for his election once more, and agreed to do his best in that capacity; but he feared that lack of time would prevent his doing as much as he should like, and full justice to such an undertaking. The help he most wanted was in the provision of papers for the programme.

The Librarian urged the importance of acquiring another bookcase, the present ones being absolutely full. The library was growing considerably, and its proper preservation depended on more accommodation being provided forthwith.

Mr. Henderson kindly notified his willingness that the sum granted by him for competitions, which had failed, should be devoted to the object mentioned, if room could be found for its reception.

He was heartily thanked for his generosity.

The rules received an addition, of which notice had been previously given.

Mr. Freshwater proposed, and Mr. Beckett seconded, that to Rule 7 be added the words, "The payment of three guineas in one sum shall constitute life membership." This was carried.

Mr. P. Everitt, in the course of some remarks, recommended that the Librarian should endeavour to provide for readers the *Photographische Correspondenz*, as also the set of Eder's *Jahrbuch*.

The following gentlemen were appointed to serve as the delegates of the Association upon the Committee of the Affiliation of Photographic Societies: Messrs. E. H. Bayston and P. Everitt.

Croydon Camera Club.—A whole-day outing was held on June 16, when the President (Mr. Hector Maclean, F.R.P.S.) led a party of members through some unfrequented byways of South Surrey. Amongst other "pictorial places" visited were Churlwood, Newdigate, Cuddington Moat House, Quaquer's Farm, and Capel. In consequence of the heavy rain at starting time the attendance was much below the average, but the weather afterwards turned out to be wonderfully fine, and the route was both fresh and attractive. On June 19 Mr. H. E. Holland conducted another excursion to Godstone. In addition to this Mr. Woodcock, piloted a number of members, by devious and out-of-the-way paths, from Dorking to Gomshall.

South London Photographic Society.—The President (Mr. F. W. Edwards, F.R.P.S.) in the chair.—An address was given by Mr. C. F. Dickinson on

Developers: their Constitution, Use, and Abuse.

He said that plate-makers' formulæ gave the best results, and he advised beginners to follow them. Complicated developers were not to be recommended, and, in his opinion, the more simple the developer the better. In his opinion, metabisulphite of potash was the best preservative. The use of developing agents dry was common years ago, and he believed now, for rapid exposures, it was best, especially with amidol, but it was necessary to be careful with the use of bromide of potassium when using the latter developing agent. Formulæ were given for pyro-amonia and pyro-soda developers. For gelatine lantern plates he recommended the following, used in equal parts: (*a*) Hydroquinone, 100 grains; metabisulphite of potash, 50 grains; water, 10 ounces. (*b*) Caustic soda, 100 grains; sulphite of soda, 50 grains; water, 10 ounces. For bromide paper he recommended amidol as the developer. It was possible to develop with metol and sulphite only, but to accelerate developers recourse must be had to carbonate of potash or soda. In preparing metol developers, it was necessary to dissolve the metol first, adding t sulphite after. One-solution developers should only be used where the e posures were correct. He concluded his remarks by an illustration of the pr paration and development of wet-collodion lantern plates, for which he furnish formulæ.

Bradford Camera Club.—At the weekly meeting on Thursday, June 2 there was a large attendance of members to hear the President (Mr. Walt Booth) lecture on *Platinotype Printing*, which he gave by special request.

FORTHCOMING EXHIBITIONS.

1897.		
Sept. 1–Oct. 13	Glasgow International.	W. Goodwin, 3, Lynedoc street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Ha over-square, W.
December 9–11	Aintree Photographic Society.	

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is tak of communications unless the names and addresses of the writers are given.*

COATING LARGE PLATES WITH COLLODION.

To the Editors.

Gentlemen,—My attention has been drawn to some description your Journal respecting the cost of the 24×18 prepared plates wi which thirty years ago I took the negatives from which were printed t photographs which I have lent, at the request of the Crystal Pala Company, for the Imperial Victorian Exhibition; and, thinking a f remarks may be expected from me, I send you the following observatio and details.

I find your correspondent, "Dogberry," was under the impression th a nitrate of silver bath was used in the preparation of the plates, and M Wilkinson adopted the same idea. The fact is, no such bath was use for, as I have stated in notes attached to the prints, the negatives we taken by the collodio-bromide *emulsion* process, which originated wi Messrs. Bolton and Sayce, and the pictures are considered of intere from the fact that they were the first large photographs taken *without nitrate of silver bath*, and were the first convincing proofs of the gre value of the discovery that the silver bath, with all its endless troubl could and might ultimately be entirely dispensed with. The proc attracted little attention outside the Liverpool Amateur Photograp Association until, at a *soirée* of the British Association in 1870, I hibited in St. George's Hall both negatives and prints, which attract the notice of scientific visitors from distant places at home and abro (see The British Journal of Photography, vol. xvii., fol. 452).

I never calculated the cost of each prepared plate, but the sheets glass did not cost me less than 10*s.* each before being prepared. Th were cut from the best patent plate, selected so as to be free from vari defects, and of the same thickness at all the edges. I think each pi weighed from four to four and a half pounds. The ordinary plate gla which I first used weighed about eight and a half pounds each. I such large negatives it was *then* absolutely necessary to use pl glass, for, apart from other defects, there was no *unpolished* sheet gl flat enough to bear the necessary pressure against the plate glass of printing frames. At that time photographers sensitised their own pap which, after drying, was not so flat as the sensitised now sold.

I had to make my own collodion, as none of the collodions then s answered my purpose. I used a cotton prepared at a high temperatu and ether and absolute alcohol of the greatest strength and puri the s. p. of the latter, I think, was 805, and was necessary because used a few drops of water to assist in dissolving the nitrate of silv If I used alcohol of the ordinary strength, the films mottled before su large plates were perfectly coated. The collodion had to be kept so weeks to mature and settle, then the clear part was drawn off with syphon, so as to leave the sediment and floating impurities in the bott Before coating the plates, they were ground round the edges with eme and rendered chemically clean with nitric acid; then, after washi flooded with a clear solution of albumen, the drying of which w completed before a clear fire, after which they were kept in a plate b till wanted. When I intended to coat the plates, I sensitised the col dion in the morning with the required amount of nitrate of silver, sha it up at intervals during the day, and at night, after the household h retired to rest, proceeded with the operation. The collodion emulsi after being strained through cotton-wool, as wanted, into a large wi mouthed bottle (12 ounces, I think), was poured upon the plate held a pneumatic holder, and, when a sufficiently large pool was formed, was allowed to run to the nearest left-hand corner, and then to the oth at the same end; then, alternately, to the corners at the right han

afterwards, the wave was caused to flow evenly to the left-hand edge of the plate, and back again to the right-hand or bottom edge, when the excess was drained off at the nearest corner. I adopted this mode of coating the surface in order to get the film at both ends as near the same thickness as possible.

The plates, when coated, were washed in several changes of water, to get rid of any trace of free nitrate of silver, and the other nitrate salts; after washing, the plates were immersed in a dish of a solution of tannin, then drained, and afterwards dried in a specially designed drying box, heated with a bunsen burner, and so contrived that a current of filtered air passed through the box without heating or cooling the plates more in one part than another. When the plates had cooled, they were backed with a mixture of annatto, burnt sienna, gum, and treacle; dried again, and put in a grooved plate-box, and so kept until placed in the camera-back at the place of exposure, and afterwards, until developed. They would not bear packing with paper between them.

I may mention that the porcelain dishes then cost 25*s.* each, and Mr. Bolton had not brought out the washed emulsion process; also that coating large plates with emulsion was not quite the same as with ordinary non-sensitised collodion, the latter being more fluid than the former. Occasionally a film would not be quite perfect, and sometimes one would be spoilt in the after manipulations, and had to be put aside to be washed off. The residue of the collodion or emulsion I did not use. The plates were not developed in a dish, but on an inverted washhand basin, levelled in a large enamelled metal dish.

These details may weary some of your readers, but others may be interested in comparing the operations of an enthusiastic amateur thirty years ago with the enthusiasts of to-day.

The collodio-bromide emulsion process of Messrs. Bolton and Sayce being the first emulsion process, was one of the most important discoveries in photography; now, gelatine is generally used instead of collodion, otherwise the emulsion is much the same. There is not now, I may safely say, a photographic studio or an astronomical observatory in the wide world where emulsion plates or films are not in daily use. I think the introduction of the emulsion process was an era in the glorious reign of our good Queen-Empress.

Pray excuse the length of this epistle, and believe me, yours, &c.,

O. R. Green.

"DEVILS" IN PHOTOGRAVURE PLATES.

To the Editors.

Gentlemen,—In your issue for this week is an article, *The Truth about "Devils,"* from *Wilson's Photographic Magazine*, in which the writer cites two articles on this topic, and, after doing so, dismisses the opinions of the authors quoted (with a cheery light-heartedness which is quite refreshing this hot weather) as "nonsense—mere guesswork." The writer then proceeds to detail various interesting experiments of his own, and, amongst others, the preparation of plates without ground, and with fine, medium, and coarse-grained grounds, which pass through the usual photogravure operations and are finally etched through the resist. On examining them the writer says:

"We first take up the ungrained plate and examine it carefully. We find that, on account of the absence of grain, there is not much of anything on the plate, simply a weak impression of the picture. That, however, is of little consequence; what we are looking for are the 'star-shaped indentures.' We do not find one. We take up the plate with the finest grain, and the result is not quite so satisfactory; there seem to be indications of these holes, but they are so slight as to be hardly noticeable, unless we were looking for them. This plate we will put aside and take up the medium-grained plate. To our surprise there is quite a sprinkling of holes in this one, and they are quite large enough to be plainly seen. The experiment becomes interesting, and, putting this plate also aside, we take up our fourth and last plate. This is the one with a very heavy grain. Surprise does not express our feelings as, on examination, we find it to be full of holes, varying in size from the almost invisible to some almost an eighth of an inch in diameter."

Further on in the article I come upon this:—

'There is one more point I should like to call attention to, and that is, the complete absence of these defects in the high lights and in the deepest blacks. There are some in the tone next to the deep shadows, but they are small, and the surrounding colour tends to hide them, so that a plate is never rejected on their account. It is always in the middle tones of the picture that the spots are most pronounced, and, in the case of a graded background, they are noticeably larger toward the darker portions of it, and run lighter toward the high lights, where they are lost to sight. I do not mean a uniform gradation, for there will be small spots in the darks, but the largest ones are always found in the darker middle tones."

In sundry published articles I have described my own experiences with "devils," and an effectual means of preventing them, and need not, therefore, take up your space by recapitulating what I have had to say on the subject; but I wish to point out that, firstly, I have had as large crops of "devils" on the finest as on the coarsest-grained plates, and the individual specimens were quite as large in the one case as the other; and, secondly, as to the absence of "devils" in the deepest blacks, this is directly opposed to my experience. With me, if "devils" made their appearance, it was *always* in the deepest shadows that they were most plentiful and largest in size. In the middle tones I rarely had any. In the lights, of course, one does not expect to find them.

I remember, when I was making experiments with grounds of various kinds, fine and coarse, close and open, in connexion with "devils," I found it convenient to use a transparency of one subject over and over again. It was a landscape, with light sky, hilly distance and middle distance in half-tone, and foreground of rocks, stream, and bridge, in which bright lights and strong darks were intermingled. The strongest darks were in certain parts of the rocks, and especially under the arches of the bridge. I must, in the course of my experiments, have engraved more than twenty plates from this subject, all badly pitted with "devils." After I had done two or three, I got to know quite well where to look for and find "devils" in the succeeding plates. They were always in the same places, and always worst in the darks under the bridge.

In aggravated cases, I have found "devils" in the half-tones as well as the darks, but this is the exception, and whenever it has occurred the "devils" in the darks on the same plate have been worse than those in the half-darks.—I am, yours, &c.,

Thomas Huson.

Northcote, Waterloo, near Liverpool, June 26, 1897.

THE USE OF BLOCKS FROM COPYRIGHT PHOTOGRAPHS.

To the Editors.

Gentlemen,—May I appeal through your valuable columns to the Committee of the Photographic Copyright Union to concede a point to the Illustrated Press in regard to the payment on the second use of a block?

I contend that, in many cases where a block has been made and a fee paid, a second use should be allowed on payment of a fee, say, of half the amount.

In nine-tenths of the cases it would be clear gain, as there are many occasions when a fresh use would be worth half price, but not a full fee.

Therefore, Mr. Editor, I do hope that the Committee will meet the Press in this very legitimate desire, as, apart from the good it would do, it would certainly pay.

Perhaps Mr. Bishop or Mr. Elliot will take up the matter—I am, yours, &c.

Claude Montgomery.

THE NEW ERA IN LENS CONSTRUCTION.

To the Editors.

Gentlemen,—We are apt to pass over the exalted claims of advertisers with a smile, but how far we may be justified in our forbearance is open to question.

Under the title, "The New Era in Photographic Lens Construction," Messrs. Taylor, Taylor, & Hobson have issued a pamphlet which, by its exclusive eulogy of the Cooke lens, would almost lead the reader, unacquainted with photographic optics, to suppose that the greatest improvements in lens construction were their own, and found their highest consummation in the Cooke lens. Is it not a fact that this era began long before the invention of this particular lens, and that we have to thank Germany, not Leicester, for its inception? The discovery of new optical glasses, manufactured by Schott & Genossen, placed at the disposal of opticians the means of correcting astigmatism, and it was the year 1888, not 1894, that brought us the first invention—the Concentric. The Goerz and many of the Zeiss series antedate the Cooke, and, as Messrs. Taylor, Taylor, & Hobson have put forward a transcript with the Cooke lens at *f*-8 under an angle of 54° as a wonderful achievement, I send you herewith a test published a few years ago in Germany. This was taken with a Goerz lens at *f*-7·7, and includes an angle of 67°. The diagonal of the picture is 7·9 inches, but it would only measure 6·1 inches if the margin were cut off to reduce the angle to 54°. I leave you, Sir, to form your own opinion of the quality of definition outside the lesser angle.

Yet Messrs. Taylor, Taylor, & Hobson conclude their pamphlet with the phrase: "These tests afford the clearest possible evidence of the unsurpassable excellence of Cooke lenses."

I have referred to the Goerz and Zeiss lenses, but there are others, and amongst them Steinheil's should not be forgotten. I have before me tests published by this firm taken with the rapid antiplanet, *f*-6·5, and orthostigmat, *f*-6·8, covering 50° and 70° respectively, with fine definition.

Messrs. Taylor, Taylor, & Hobson claim "unsurpassable excellence" for the Cooke lens. If this is a fact, would it not be more to their advantage to publish tests in comparison with the highest types of modern lenses, instead of the old rapid rectilinear, which, by the way, was not the freest from astigmatism of its time? Why flog a dead horse?—I am yours, &c.,

P. Everitt.

88, *Evering-road, London, N., June* 26, 1897.

A CORRECTION.

To the EDITORS.

GENTLEMEN,—Our attention has only just been drawn to a paragraph in this year's BRITISH JOURNAL PHOTOGRAPHIC ALMANAC on page 881, in which there is a brief description of a new oxygen factory.

In this paragraph the following statement occurs: "The process employed is, of course, the well-known barium process." This statement is incorrect, the Brin Companies being the sole makers of oxygen by the barium process, and we may add that the process as developed by us differs now very materially from all text-book descriptions, and is strictly protected by patents.

We shall be obliged if you will, at the earliest possible opportunity, contradict in THE BRITISH JOURNAL OF PHOTOGRAPHY the statement made in your ALMANAC for 1897.—I am, yours, &c.,

T. N. HESTER, *Secretary.*

Brin's Oxygen Company, Limited, 34, Victoria-street, Westminster, S.W., June 28, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

H. C. Meiser, 29, Castle-street, Salisbury.—*Photograph of Diamond Jubilee ox, Salisbury* (10×8).

John Kennerell, 7, York-row, Wisbech.—*Photograph of the Loyal Order of Ancient Shepherds, officers and delegates attending the Seventy-first A.M.C., Ashton Unity, and Forty-ninth A.M., Wisbech Unity, at Wisbech, June,* 1897.

William Donaldson, 14 and 16, Abbey-street, Carlisle.—*Photograph of the birthplace of Sam Bough, R.S.A.*

Edwin Avison, 9, Fishergate, York.—*Photograph of the united Sunday-school scholars singing the National Anthem in the gala field, York, June* 22, 1897.

D. PICKARD.—Received.

STUMP.—Messrs. Percy Lund & Co. publish a little work on the subject by Mr. Bool. It is the only one of the kind published; price, we believe, sixpence.

G. A. D.—Messrs. Dawbarn & Ward, 6, Farringdon-avenue, publish a beginner's book, by Mr. W. Ethelbert Henry, which is the most likely to suit you; price, we think, one shilling.

CLUBS.—PUNCTURE. Clubs are "run" on several different lines, according to the ideas of those who trade by them. Such a purely business matter is hardly a fit subject for this column.

J. HILL.—*The Half-tone Process,* by J. Verfasser (published by Percy Lund & Co., Bradford, price 3*s.* 6*d.*), will give you all the information you require. There are no patent restrictions.

DEVELOPER FOR FERROTYPES.—L. WADSWORTH says: "Will you be kind enough to let me know of a developer for prepared ferrotype plates?"—We are not sure that a developer is sold ready mixed for the purpose. If there is, it may be obtained at Fallowfield's, Charing Cross-road.

STALE PLATES.—SOLD. We don't see that you have any remedy. You bought the plates at an auction sale, where goods are sold with all faults, according to the conditions of sale as printed in the catalogue. Of course the makers will not exchange them. They may be years old; perhaps that is why they found their way to the sale room.

DAMAGE FROM STORM.—SURREY asks: "Who is liable for the repair of the roof of a studio that has been damaged by a severe hailstorm? The lease says, all 'fair wear and tear;' but does not the damage from an abnormal hailstorm come under the term 'an act of God,' and so make the landlord liable, and cannot he be compelled to do the repairs; he refuses?"—As the premises are held under a repairing lease, the tenant will have to do all the repairs rendered necessary by the storm.

COLOURED PRINTS.—B. A. F. writes: "I should be glad if you could inform me, in your next issue, where the colouring materials are to be had for tinting landscapes, street views, &c., which we see in many of the shops of local views? It appears to me to be some kind of dye, perhaps applied at the back of the print. They give a very tasty appearance, and, no doubt, you could enlighten me on the matter, for which I should feel obliged."—Probably the prints are by a mechanical process, as large numbers of local views are now so produced. If our correspondent will send us one or two examples to see, we shall be pleased to assist him.

FLAT PRINTS.—T. KOHLER. The cause of the flatness of the bromide enlargement is over-exposure. In the next essay, with the same negative and similar condition of light, give only one-third the exposure.

COPYRIGHT.—PROVINCIAL writes: "I have just had a commission to photograph some rooms in a large house. In one of them there are two engravings that I know are copyright, as there was a prosecution for piracy in connexion with them some months back. I wanted to place the camera so as to avoid including them, but I was not allowed. These two prints show in my negative. Do I run any risk in the matter?"—None whatever in such a case. A copyright work may be included in a photograph of this kind, provided that it is not an important part of the picture. If it were the most conspicuous object in it, the case would be different.

LIGHTING.—S. J. R. All the pictures show that there is far too much diffused light in the studio, hence the general lack of *chiaro oscuro* in the portraits and groups. The only way to obviate this is to concentrate the light more directly on the sitters. In the photographs the light seems to come from all directions, and a large proportion of it directly from the front. All direct front light should be avoided, and only a front side light used. Cannot you get a few lessons in lighting from some professional photographer, as well as instruction generally? Until you can produce far better pictures than the examples sent, we should advise you not to attempt to start in business on your own account. Excuse us speaking so plainly.

PORTRAIT LENS.—S. STEPHENS says: "I recently bought an old portrait lens, bearing the name of Voigtlander, and do what I will I cannot get a sharp picture with it. On the ground glass it seems sharp enough, but the negatives are all very unsharp. I should have suspected the camera as being at fault, but that cannot be the case, as I get sharp pictures in it with other lenses. Is it likely that the name has been put on fraudulently?"—Scarcely likely. The earlier portrait lenses of Voigtlander did not have the visual and the chemical focus coincident, and that, doubtless, is the case with the instrument in question, which may be an excellent one when the necessary adjustments for the chemical focus are made after the image is focussed.

JUBILEE DAY.—IMPRIMEUR asks: "Could apprentices be made to attend business on that day? If out-door groups and photographs of a procession are taken, and the operator thus obliged to attend (from 10.30 a.m. to 10.45 p.m., with short intervals, amounting to three and a half hours), would it be unreasonable to ask for extra pay at the end of week, when usual business hours are 9 to 6 p.m.? What would be about the usual pay for a great event like Jubilee Day? About half the week's earnings for the day extra?"—We are not aware that there is any set rule in such cases, Jubilee days are so rare. We should surmise, however, that it is more a "give-and-take" arrangement than anything else. Say, if the apprentice can render his master any service, he willingly does so, and, in return, his master recompenses him for any little extra service he may have rendered.

TONING.—W. H. J. says: "1. I use combined fixing bath. Will cutting prints on zinc affect them? I find this blunts the knife much less than glass. 2. The formula given by makers of paper acts too quickly, and gives very blue tones. I dilute it with fifty per cent. of water, and leave the prints in a correspondingly longer time, and get much warmer tones. Is this likely to affect prints adversely? 3. The formula used is in two solutions, viz., hypo, &c., and lead acetate, with gold. If I use less of the latter, and the former usual strength, should I get warmer tones, and would it be safe so to do?"—1. If particles of zinc are detached, and get in contact with the prints while washing, they will be liable to form spots. 2. Not if the prints are allowed sufficient time for fixing. 3. The risk of fading will be much increased. See what we and others have said on previous occasions on lead toning.

TONING.—H. STEEL writes: "Would you be so kind as to give me a good formula for working the phosphate toning bath, using the Ilford P.O.P., and explain my mistake in the following: On Friday last I thought I would try the phosphate of soda toning—the formula given in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897, by the Rev. J. Carter Browne, D.D., page 736: Soda phosphate, 1 drachm; gold, 1 grain; water, 15 ounces. This I found to give a beautiful tone, but, my having three different tonings, I put the prints into a bath of salt water till all was toned, as I wanted to make the one fixing bath do for the lot. Now, so far, I was quite delighted with the tone I had got; but, after washing as usual, and putting them into the fixing bath, made at 3 ounces of hypo to the pint of water, same as I have used when using the sulphocyanide toning bath, I was greatly disappointed to see all the prints turn to a beastly cocoanut-matting colour, and the fixing bath turning to a faint yellow colour. Now, what to do I did not know, but any how I thought I would try washing them to free them from the hypo, and so retone them if I could; so I made up a new toning bath of sulphocyanide, leaving out the sulphite, and set about retoning, and by doing this I found I was getting a tone of some sort, to the relief of my mind, but the finished tone I got was of a velvety-blue tone, not at all, I thought a disagreeable tone. Any how, I was better satisfied, for it just saved a large batch of prints. But will they keep this tone, as I mounted them without refixing? I might state that the toning baths were quite freshly made up. I mean the phosphate baths."—We see no reason why the tone should change, and we also see no advantage in using a toning bath other than that recommended by the makers of the paper employed. The bath that may be best suited to one paper may not do for another, and *vice versâ*. As a rule, the makers of the different papers may be credited with knowing the formula with which they yield the best results. The P.O.P. of the different makers vary materially in their characteristics, hence the toning bath that can be used with one may not suit another.

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EX CATHEDRÂ.

Sir Henry Trueman Wood sends us an interesting letter on the Dansac-Chassagne colour process, which we print in the Correspondence columns of the Journal this week. As the result of some further experiments with the process, which he was the first to describe in this country, he is enabled to supplement, and in parts modify, the information he has already published on the subject. The principal points of Sir Henry's letter may be thus summarised: (1) He is unable to describe the materials employed, the process being worked as a secret one. (2) He is of opinion that "selective action," or, as it is also termed, "selective colour absorption," does to "some extent exist" in the production of the coloured results from the various solutions. (3) No particular plate or print is necessary. The final paragraphs of Sir Henry's letter allow the process to be one of providing a "means of colouring photographs, and with approximate correctness, that has not been previously available." The absorption theory remains in doubt; but we do not apprehend that there now exists in any authoritative quarter a disposition to regard the Dansac-Chassagne process, judged solely by its results, as a solution of the problem of taking photographs in natural colours. The process, however, is of considerable commercial interest, and we do not suppose we have heard the last of it. We are sure that our readers will join us in thanking Sir Henry Wood for the scientific interest he has exhibited in the matter.

* * *

An illustrated sectional list, No. 1, reaches us from Messrs. Morgan & Kidd, of Richmond, S.W., who devote it to their bromide papers, specimen prints on which are given, ordinary bromide, platino-matt, cream crayon, rose enamel, and white enamel being chosen for illustrations. The prints, which are from negatives by Van der Weyde and others, are of exquisite quality, and reflect very favourably on the merits of Messrs. Morgan & Kidd's papers; indeed, it is seldom our lot to come across such beautiful results, creditable alike in respect of subject, negative, and print.

* * *

Mr. F. H. Glew, the well-known chemist and photographic dealer, sends us a card giving a view of his radiographic laboratory, which appears to contain all the essential requirements for X-ray work. Mr. Glew styles himself a radiographer, and points out that radiography has the following uses in diagnosis: Fractures, dislocations, malformations, spurious pregnancy, impacted bodies, gout, calculi, calcified tissues, necrosis, &c. All surgical work, he adds, must now stand the test of X rays. Mr. Glew's terms appear to be very reasonable, and he has evidently gone to great trouble and expense in fitting up his laboratory.

* * *

It is a trite remark that there is nothing more charming in the whole range of photographic positive work than a well-executed Daguerreotype. In former years Messrs. Negretti & Zambra were justly renowned for the excellence of their productions in what is now almost the lost art of Daguerreotypy, and they have been good enough to send us a few specimens of the results that once largely issued from their house. The subjects photographed are scenes and courts at the Crystal Palace, and, although made many years ago, the pictures retain all their original purity and richness. We believe that there are many of our readers who would welcome the opportunity of adding a few good Daguerreotype specimens to their collections of photographs, and for their information

we may say that Messrs. Negretti & Zambra, whose address is Crystal Palace, S.E., have a stock of the pictures in hand.

* * *

The South London Photographic Society are noted for the thoroughness with which they carry out their photographic excursions, their holiday visits to cathedral cities usually attracting large musters of members. Moreover, unlike most photographic excursions, the expeditions of the Society invariably result in the production of many excellent photographs taken on these occasions. We learn from the particulars sent us by Mr. W. F. Slater, who is to lead the Society, that an excursion to Hamburg is projected for August 14 next. As an example to other societies, we append the programme in full, and trust that it may provoke imitation. We congratulate the members of the South London Society on their enterprise, and wish them a successful and pleasant time on their first Continental excursion, which we prophesy will not be its last.

* * *

"South London Photographic Society. Hamburg Excursion, August 14, 1897. Leader, William F. Slater. Fare per Great Eastern Railway, second class rail and saloon, 1*l.* 15*s.* 9*d.* (*This special fare has been granted on condition that the party numbers thirty.*) Headquarters, Hôtel Union. Tariff, 6*s.* per day for bed, breakfast, dinner, and supper, including attendance. Programme: Saturday, August 14, depart from Liverpool-street, 8.30 p.m.; Harwich, 10.30 p.m. Monday, August 16, arrive early morning and spend day in Hamburg. Tuesday, August 17, morning in Hamburg; afternoon excursion to Neuengamme by boat, returning by train. Wednesday, August 18, day excursion to Lübeck by rail. Thursday, August 19, morning excursion to Blankenese by rail; afternoon in Hamburg. Friday, August 20, morning in Hamburg; afternoon excursion to Buxtehude by boat, returning by train. Saturday, August 21, day in Hamburg, starting for home 11.30 p.m. Monday, August 23, arrive Harwich about 6 a.m., London 8 a.m. Estimated total cost, 4*l.* 15*s.*"

* * *

The complete arrangements for the Great Yarmouth meeting of the Convention are published in this week's Journal. Mr. Drage, the Honorary Secretary, asks us to state that all further communications on the subject of the Convention should be addressed to him at the Headquarters, Queen's Hotel, Marine Parade, Great Yarmouth.

TONING EMULSION PAPERS.

Although many have considered that the introduction of the gelatino and collodio-chloride papers would ring the death knell of albumenised paper, it cannot now be denied that many professional photographers not only adhere to the old albumen paper, but that many who gave it up have gone back to it again for every-day use. That albumenised paper gave better results is an open question, and one that must be answered to a great extent by the personal equation. Looking at the question broadly, we must not forget that we have hardly had such a long apprenticeship to these newer papers as we have had with the old, and therefore we may not be able to turn out negatives so suitable for them as we could for the old paper.

There is, however, a very strong feeling that the papers are not quite so amenable to toning as the old, that one is never quite so certain of getting just the tone one wants; and, above all, one often has to contend with double toning which we all know so well.

It is gratifying to find that the use of the combined bath is getting less and less, for, although the use of this may be considered time and labour-saving, there is not the slightest doubt that the results are by no means permanent, and, even with fresh-made baths and all care, there is a great liability for the whites to be faintly tinged. Whether, when the combined bath without any alum, acid, or lead salt, be used, and the print be well washed first, and the bath be not used too long, the results are as fugitive as is undoubtedly the case when an acidulated toning bath be used, can only be determined by a long series of experiments extending over many months.

The sulphocyanide bath, which is now more generally used, is by no means all that can be wished, for even with this with the greatest care it is sometimes difficult to stop double toning. Several methods have been suggested to prevent this peculiar action—one by Mr. J. B. B. Wellington, which consisted of bathing the print before toning in an alkaline solution of sulphite of soda and then thoroughly washing; another, which was suggested by the Britannia Works Company, was the addition of a small quantity of sulphite to the toning bath itself; a third method, the author of which is unknown, is by the addition of chloro-platinite of potassium to the gold bath.

If Wellington's method be used, and the print be not thoroughly freed from sulphite prior to toning, we have precisely the same state of things as in the Ilford formula, with, of course, some uncertainty as to the quantity of sulphite present. The action of sulphite of soda on chloride of gold is fairly easy to determine by a few simple experiments. If, to a solution of chloride of gold 0·1 per cent., a ten per cent. solution of sodium sulphite be added drop by drop, stirring all the while, it will be seen that a point is reached at which the solution becomes quite colourless, and, whilst it is possible to tone, there is great tendency for the whites to be tinged with violet, in fact the sulphite acts as a reducer, and, if sufficient be added to the chloride of gold solution, metallic gold will be precipitated.

If but a small proportion of sulphite be used, and it should not exceed half the gold, better results are obtained; but still better results are got when some salt is added, and a bath of this kind of the following composition will be found to tone fairly satisfactorily:—

Chloride of gold	2 grains.
Salt	40 ,,
Sodium sulphite	½ grain.
Water	8 ounces.

Allow to stand for one hour or till colourless, and then use.

The use of chloro-platinite of potassium was either suggested for the same reason as the sulphite was used, or, what is possibly more likely, it was added purely as an experiment, and found to answer. When added to the gold solution, it will, when allowed to stand, cause the precipitation of the gold, and therefore too much must not be added, and the addition of an alkaline chloride, preferably salt, makes toning more regular and even. Such a bath is—

Chloride of gold	2 grains.
Salt	40 ,,
Chloro-platinite of potash (ten per cent. solution)	2 m.
Water	8 ounces.

It will be noted that both these baths are double the strength of that usually employed, but they will be found to act more regularly and with less chance of double toning.

It is curious to note how the old sel d'or has dropped out of use, and yet with this excellent results are to be obtained on the newer printing-out papers; probably its bad name arose through the more general use of the alkaline baths with albumen paper, and since the introduction of the emulsion papers it has never had a fair trial; possibly also some of its disgrace may be due to the use of inferior and extremely acid chloride of gold. It is a bath easy to make, and will give very good results if properly made. A good formula is—

Chloride of gold	2 grains.
Hyposulphite of soda	20 „
Salt	20 „
Water	8 ounces.

The proper way to make it is to dissolve the hypo in half the water, and add the salt, and then dissolve the gold in the remainder of the water, add a pinch of prepared chalk and shake well, and mix gradually with the hypo solution and then filter. It can be used at once, but the prints must be well washed prior to toning.

It will be found that there is a good deal of indecision as to whether the sulphocyanide bath should be acid or alkaline, but it may be taken for granted that both the sulphocyanide and the sel-d'or baths will tone quicker in an alkaline condition, but they will not keep after use, whilst, if acid, they tone more slowly, give as a rule bluer, that is, less purple tones, but keep very much better.

One of the most satisfactory baths for emulsion papers is a combination of hyposulphite and sulphocyanide such as—

Chloride of gold	2 grains.
Sulphocyanide of potassium.....	30 „
Hyposulphite of soda	2 „
Water	8 ounces.

and neutralise with carbonate of soda, of which probably at least five grains will be necessary for the above bath.

When the plain sulphocyanide bath is used, it need not be thrown away after use, but may be strengthened by the addition of gold and sulphocyanide, for this purpose a strong stock solution of chloride of gold fifteen grains, sulphocyanide of potassium half ounce, dissolved in sufficient water to make fifteen drachms in all. This makes a thick orange-red solution, which must be shaken well before adding to the used bath.

That at present we have no really satisfactory toning bath for chloride papers such as we had for albumenised papers is to be deplored, but possibly a few experiments with little-known salts and various makes of papers would give us what we want. It is useless to carry out experiments with one make of paper only, for all the commercial papers differ to a considerable extent with regard to their behaviour to toning baths.

A Useful Article.—At a recent meeting of the Photographic Club, when the subject of the changing and repacking of plates was under consideration, one of the members mentioned that his method was to pack them face to face, and secure them together with two or three strips of American sticking plaster. This held them as firmly as a solid block, and prevented them from rubbing one against the other. This plaster requires neither wetting nor heating, as it is simply necessary to press it firmly in contact, when it adheres with great tenacity. Its surface appears to be somewhat analogous to that of the adhesive tablets sold for holding cut films in the ordinary dark slides. Apart from the repacking of plates, this plaster would often be found useful in the photographer's kit for extemporaneous purposes; for example, in repairing a broken focussing screen, an accident to the bellows of the camera, or, say, affixing a non-actinic fabric to a window, &c. The plaster is very inexpensive; it may be had in sheets of various sizes, but perhaps the most convenient for the photographer's purpose is the sixpenny box, which contains a roll several yards long and about half an inch wide.

Bleached Lac.—A few weeks back we replied to a correspondent about the ordinary bleached lac of commerce not giving a clear solution when dissolved in alcohol, and mentioned that we had tried some samples bleached in Germany that did so. A writer, the following week, says that if the lac does not wholly dissolve it was bleached with chlorine, and still contained some traces of it. Now, the fact that the lac was bleached with chlorine, and might still contain traces of it, will not account for the whole of it not dissolving in spirit and forming a clear solution. Shellac, whether bleached or unbleached, is a somewhat complex substance, as it contains several distinct resins, as well as gluten, some of which are insoluble in alcohol, hence the sediment so generally met with. There is, however, a method of separating these insoluble matters when the lac is bleached, but we believe it is not usually practised in this country, on account of the expense and loss in weight, though it sometimes is in Germany. It is noteworthy that the German lacs we have referred to as dissolving without sediment have cost about double the price of the English bleached lac of commerce.

A National Photographic Record.—A meeting was convened by Sir B. Stone, M.P., at the Grand Hotel, St. Pancras, for last night, of the National Photographic Record Preliminary Committee. This Committee consists of members of the Royal Society, the Antiquarian Society, the Geographical Society, the Royal Photographic Society, &c. The suggestion is the formation of a great collection of photographs illustrating our national life, and, we believe, of photographic surveys as well. If the idea be carried out, we would suggest that, from the beginning, attention should be given to the permanence of the results, not only in the prints, but the negatives. Carbon and platinum prints are looked upon as being permanent in the general acceptance of the term. Can the same be said of the negatives, the majority of which will be in gelatine? That negatives or prints may have stood for fifteen or twenty years is no proof that they are *permanent*. Negatives are easily broken, and prints may be destroyed by fire. To secure a lasting record for the use of future generations, which, we take it, is the object aimed at, we should suggest that photogravure be adopted. If a photogravure plate, in copper, be obtained, there is no question as to its permanence, and the facility with which any number of copies can be obtained at any time as required, and also of their undoubted permanence. If such a movement as the above be undertaken, it should be started on a sound basis.

Printed in Germany.—The Jubilee celebrations may now be said to be a thing of the past, and some of us have perhaps had enough of them for a time. There is probably not a house in the kingdom that does not contain a good portrait of Her Majesty, and, at the same time, a good picture, thanks to the presentation prints given by the illustrated papers, and some that, in the usual way, do not issue illustrated supplements. When, several weeks before the illustrious event, our attention was called by the bookstall attendant at our local railway station that the *Times* was going to issue a Diamond Jubilee portrait of the Queen—"a photogravure in colours"—and that it was necessary, in order to obtain a copy, to enter the order at once, knowing quite well that anything the *Times* would do would be well done, we gave the order. In due course we received the picture, which probably cost several times the price of the newspaper. It is printed in oil colour, and we have little hesitation in saying that, as a work, it far surpasses any other of the many presentation Jubilee prints. But why, oh, why was it

printed in Germany? Was it that the *Times*, the leading paper of Great Britain, found that it could not get the work so well done in this country? or was it that the cost here would have been prohibitive? or was it the two reasons combined? The picture is a credit to the *Times*, and we would that it had been produced in Great Britain.

Painted from a Photograph.—A somewhat amusing case was tried in the Queen's Bench Division of the High Court of Justice one day last week. It was a dispute about some pictures which had been painted to order but were rejected by the defendant, who refused payment, because the portrait of his wife, and the likenesses of some dogs—they were hunting pictures—were not good. Of course, as usual, expert evidence was called, and that given by one of the defendant's witnesses was not a little amusing to photographers. This artist, in giving his opinion, said "the portrait of the defendant's wife looked as if it had been painted from a photograph." In cross-examination the witness said "he should not like a commission to paint from a photograph." The reply to a question, "Is it a difficult thing to paint from a photograph?" was, "All painting is difficult." In reply to a further query, "Is it difficult to get a good likeness from a photograph?" he said, "It is certainly difficult to get a good likeness." In the end the case was decided in favour of the plaintiff for the full amount claimed, and costs.

It will certainly be highly amusing to most portraitists to be told that it is so very difficult to get a good likeness from a photograph, seeing the use that most artists make of photographs nowadays, though, of course, the majority of them do not admit it. One has only to visit the Exhibition of the Royal Academy, now open, to see that the larger proportion of the portraits have, in part, been painted from photographs. When an artist does admit the use of photographs, he generally adds that he does so only to save the time of his sitters, &c. Turning from portraits to landscapes, we shall also find that photography has been largely utilised, as some landscape photographers are fully aware, whose pictures have been copied almost in their entirety. Not a few landscape painters now have their cameras and take their own photographs, which they find greatly aid them in their work. This being the case, why should so many painters, while taking every advantage of it, still decry photography when they can get the opportunity?

FOREIGN NEWS AND NOTES.

The Age of Stereoscopy.—The *Gazette du Photographe Amateur* states that, in the Wicar Museum in Lille, are two pen-and-ink drawings, executed by Jacopo Chimenti, one of the Florentine school of painting who lived from 1384 to 1460, which represent the same subject from two different points of sight, one slightly more to the right, the other slightly more to the left, which satisfactorily combine into one image, and give a stereoscopic effect. Gallien, in 1500, described the principle of the stereoscope, and Baptista Porta, in 1593, also made some designs for the same.

Collodio-chloride Emulsion.—Vollenbruch suggests the following method of making a good collodio-chloride printing-out emulsion:—

No. 1.

Citric acid	200	parts.
Distilled water	280	„

Dissolve by the aid of heat and add—

Lithium chloride	80	„

Allow to cool, and filter.

No. 2.

Silver nitrate	560	parts.
Glycerine	200	„
Distilled water	560	„

Shake occasionally till dissolved. To every 1300 parts of a two and a half per cent. celloidine collodion add 13 parts of No. 1 and 92 parts of No. 2.

The International Photographic Union.—The third meeting of the above will be held at Brussels, under the auspices of the Association Belge de Photographie, from August 8 to 14, and will consider the following questions: 1. The preparation of dry plates sensitive to the infra-red and more sensitive to the ultra-violet regions of the spectrum. 2. Decimal classification. 3. The best methods of intensifying and reducing negatives. 4. Coloured screens as employed in orthochromatic photography. 5. The transport of sensitive surfaces through the post without risk of their being opened. 6. The action of forms of energy other than light upon sensitive surfaces. All communications should be addressed to the President (M. J. Maes, 33, Rue Rembrandt, Antwerp), or the Secretary (M. Charles Puttemans, 59, Rue du Moulin, Brussels).

Le Bon's Black Light.—M. Peligot, chief of the laboratory in the Faculty of Sciences at Lyons, has been investigating this subject, and finds that all the extraordinary effects produced by Le Bon's black light are to be ascribed solely to the penetrability of ebonite of about 5 mm. thickness to white light. It will be remembered that M. Le Bon exposed a sensitive plate for a short time to white light and then placed it behind a sheet of ebonite in a printing frame, metal objects being laid on the ebonite, and, on exposure to sunlight, dark images of the metal objects were obtained. M. Peligot finds that, if the plate be not previously exposed to light, ordinary negative images were obtained, and that the density of these was proportional to the exposure. All Le Bon's effects can be explained by the second exposure under the ebonite causing the reversal of those parts not protected by the metal objects. If this is true, it will be a warning to many not to expose their dark slides with ebonite shutters too long to bright daylight.

Packing Plates.—The second International Congress of Applied Chemistry met last year in Paris, but the full report has only just been published. Section VII. devotes itself to the consideration of photographic subjects, but little that can be abstracted appears. Captain Colson strongly recommends the use of bichromated papers for packing plates in. Ordinary paper should be soaked for about five minutes in a three per cent. solution of potassium bichromate, dried, and then exposed on both sides for some hours to sunlight, and then well washed and dried. By this means the pores of the paper are closed by the sizing being rendered insoluble, and it is quite impervious to damp or gases.

SILVER INTENSIFICATION OF GELATINE PLATES.

II.

Before commencing to intensify, it will be as well to consider exactly how the process is to be carried out, as on this will depend, in a very large measure, both the efficiency and economy of the operation. All wet-plate workers, and those who are familiar with physical development generally, will be aware with what readiness the silver is deposited by the solution upon anything with which it comes in contact. When a collodion plate is operated upon, this process of deposition is confined almost entirely to the surface of the film itself, and, in the hands of a skilful operator, little, if any, of the solution will run over the back of the glass. But with a gelatine plate developed, as is usual, in a dish, the back of the glass, as well as the sides and bottom of the dish, are richly coated with deposited silver; in fact, the metal appears to be more powerfully attracted in those directions than towards the photographic image, especially if the latter be at all under-exposed.

In order, therefore, to economise, not only in bulk of solution, but also to ensure that the silver contained in that actually employed serves a useful purpose, it is almost absolutely necessary to dispense with the usual developing dish, and, in fact, to revert to the old plan of hand development. But to work in this manner requires considerably more skill and patience when the film is one of gelatine than when collodion is the vehicle; but it is far from being the impossibility that some may consider it on first trial. A great deal depends upon getting the surface into proper condition to start with, when all will be comparatively plain sailing.

Unfortunately the very means adopted in order to place the film in a proper chemical condition for intensification will be found to tend rather in a contrary direction, physically or mechanically. I have already spoken of the desirability of using the alum and hydrochloric clearing solution, or other acid mixture, previous to intensification, but with the

y of gelatine films, especially when the alum is used, this treat- esults in rendering the surface far more repellent than it was ly. Treatment with weak alkali, preferably ammonia, has a y in the contrary direction, and will often cause the gelatine to take the solution as smoothly as collodion; but here again, nately, a great danger is introduced of stains arising from the n the film and the silver in the intensifying solution.

e alum clearing solution be used, the quantity of alum will be reduced to the minimum effective strength, which will possibly th different kinds of plates; but perhaps half an ounce to the pint a safe strength, and, if apparently weak, the hardening effect may ied by prolonged immersion, with the least injurious action in ng the surface repellent. Hydrochloric acid has less action of the kind than citric; for which reason, as well as others, it is to be d. If the clearing solution be followed by one of ammonia, a hich I do not think is to be commended, the plate must be very ghly washed before intensification, and should then be just flooded e acid pyro solution alone before adding the silver. This will, of neutralise any alkali remaining, but it must also be remembered so doing it increases the liability of the solution to become or thick if the washing be hurried so as leave any considerable ion of alkali behind. This danger can be guarded against by ing the proportion of acid, but this again slows the action of fication.

her plan, by which the flowing of the solution over the gelatine is improved, consists in mixing a little glycerine with the solution, similar effect is produced by an addition of meta-gelatine, *i.e.* e rendered permanently liquid by boiling with an acid. In fact, if mber rightly, Messrs. Wratten & Wainwright's formula consisted paration of iron, gelatine, and acid of the kind introduced by the . M. Carey Lea.

whatever means be adopted in the directions mentioned, ease of ilation will be further promoted by rendering the *edges* of the plate roof. The borders of the film then become repellent, and the n will not run over, or does so less easily, and the plate becomes, , converted into a shallow dish, which may be placed upon a g stand, or even on an oscillating table, if the motion be not too , and left to itself.

tensification be proceeded with immediately after development, the ll be in the most favourable condition, but old negatives are as susceptible to the action of the solution as new ones, but they will prove more repellent after being once dried. But old negatives found very convenient for experimental purposes, and as it is the e, before proceeding to do anything with an old film, to soften it eak ammonia, I repeat the warning already given with regard to ger of the combination of the alkali and silver.

regard to the formula to employ, I am more familiar with—and re, perhaps, prefer—the old form of pyro and citric acid, though say others may rather incline to hydroquinone and citric or other ith which, although I have had less experience, I am by no means at better results will not be obtained in the long run, owing to the length of time the solution is capable of retaining its clearness edom from turbidity.

solution for actual use contains pyrogallic and citric acids, in the tion of three of the former to one of the latter, but the quantity of may be varied with advantage according to the character of the and the amount of intensification needed. With a well-exposed e, requiring but little reinforcement, three grains of pyro and one c acid may be dissolved in two ounces of water; but, when the are generally weak, and want working up, one ounce of water will icient.

y say here that, though it is customary to give the intensifying a with the acid, sometimes combined with the pyro, and sometimes e silver, apparently indiscriminately, the former is, I think, the one for these reasons: A certain quantity of acid is necessary to n or curb the reducing power of a solution of pyro of definite th, and, if an insufficiency be present, the solution will quickly e turbid however small a proportion of silver is added. Now, if the mixed with the silver, it becomes necessary to add with the first f silver the full quantity of acid needed to keep the solution clear, herefore, if as is almost invariably the case, more silver is added, will be an excess of acid and a retarding or arrest of intensification. , however, the acid is mixed with the pyro in proper quantity, it is ble to start the operation, and, so long as the silver is added in reason- roportion, the solution will remain clear while it is working. If the solution be added too rapidly, or in too large proportions, or if the intensifier be allowed to stand in the developing glass, there will, of course, be muddiness; but, when properly used, it will remain clear for a very long time.

Therefore, the pyro and citric acid being in one solution, it is only necessary to employ a plain solution of silver nitrate, which may be of the strength of thirty, forty, or even sixty grains to the ounce of water stronger, in fact, than it is the practice to use it for wet plates, because the alkaline-developed image at least on emulsion films, seems to demand a much stronger dose of silver. It is better always to commence intensification by flowing the plate with the pyro and acid, and to let that permeate the film evenly before adding the silver, which must be done carefully, according to the result required.

If only a slight increase of density is required, a small quantity of silver is indicated, or, if the action is to be more like a continuation of development, a strengthening of details without adding greatly to the density of the high lights; but, when considerable density is required, or it is necessary to create contrast, the proportion of silver must be correspondingly increased, and here is where the value of the silver method is found. It is true, perhaps, it is somewhat more troublesome, and wants a little more understanding, than mercury or similar methods, but the increased power it gives will far more than compensate.

I mentioned last week that occasionally there will appear a transparent yellow or red stain in the shadows of a negative undergoing intensification, and with pyro there is always more or less discolouration of the nature of ordinary "pyro stain." But, as I also pointed out, these easily and completely disappear under the action of the clearing solution. If the stain prove permanent, it is certain that it arises from hypo decomposition products, and it is more than probable that insufficient fixing rather than insufficient washing is the actual cause. For this reason I would strongly urge the adoption of the always useful practice of a second fixation in *clean*, fresh hypo. Under any circumstances this is a safeguard against imperfect fixation; but, when intensification has to follow, it has the additional advantage of almost guaranteeing the stainlessness of the operation. A film so treated will require even less washing to render it safe than one that has been sufficiently fixed in a single bath, for not only is the silver more completely transformed into the soluble state, but a far larger proportion of it is extracted by the second fixing. Let it always be remembered that it is the silver that forms stains, not the hypo.

The substitution of hydroquinone for pyro, although it does away with a portion of the temporary discolouration due to pyro stain, does not make any difference in other respects in the necessity for care. So far as my experience goes with hydroquinone, it is slower in action, though that may be because I have not hit upon the best proportion. I have, as a matter of fact, only used one strength, namely, five grains of hydroquinone to one of citric acid to each ounce of water, using the silver of the same strength and in the same way as with pyro. Unlike the pyro solution, this does not discolour, and, although if left to stand in the developing glass it may deposit the silver it contains, the supernatant liquor remains perfectly clear and practically quite colourless, which argues greatly in its favour.

Either of these solutions may be made and kept in concentrated form; indeed, they keep better in a state of concentration than when diluted for use.

In conclusion, I may say that I am not at all sanguine that the great body of amateurs will adopt silver intensification, but I do think that there is an opening for it amongst professionals, and more especially in those studios where gelatine plates have been introduced for process work, for which it is, without doubt, the very best method.

W. B. Bolton.

ON THE ACTION EXERTED BY CERTAIN METALS AND OTHER SUBSTANCES ON A PHOTOGRAPHIC PLATE.*

[A Paper read before the Royal Society.]

Having some years ago prepared, for the purpose of spectroscopic examination, several uranium compounds, it was of interest to make further use of them by repeating some of the very important experiments which Becquerel has made with these compounds. He has shown that, if the metal or some of its salts be placed on a photographic plate in perfect darkness and allowed to remain there for some days, the plate becomes acted on, the action being rendered evident by the ordinary photographic process of development. This action is readily produced, and belongs apparently to all the salts of this metal, and, as Becquerel has shown, to uranous, as well as uranic, salts. It is very remarkable that this power belongs also to the salts when in solution, and, as the action passes through glass, solutions of the double chloride or of the nitrate

* Reprinted from the *Chemical News*.

contained in a thin glass bottle, when placed on a photographic plate, act readily upon it. While speaking of these compounds it may be well to record some experiments which have been made to determine whether they lost their peculiar activity on being kept in the dark.

On August 10 last specimens of yellow oxide, recrystallised nitrate and chloride, the latter in solution, were each divided into two equal portions, and all placed in similar clean, thin glass bottles. One sample of each was then placed in total darkness, and the other kept in the light. These samples have from time to time been tested by placing them on a photographic plate for a week and then developing the plate in the usual manner. Seven such examinations have been made at about one month's interval. No very marked difference between the samples in the light and the dark has occurred; on the whole, the samples preserved in the dark have proved slightly the most active, and this was decidedly the case with all three specimens at the last examination on March 26. Another experiment was begun a little later with the black oxide of uranium, which appears to be one of the most active of the uranium compounds. Equal weights of a sample of this body were placed in two similar pill-boxes with a glass bottom; one has been kept in the dark, and the other in the light; after five months there was no difference in the effect which they produced on the photographic plate. The experiments are being continued. When repeating these different uranium experiments, and using a card painted with the yellow oxide, perforated zinc was made use of simply as a screen to show the activity of the uranium compound by the density of the picture of the pattern formed; but, in place of obtaining in all instances a negative of the perforated zinc, *i.e.*, the action occurring where the plate was exposed, and none where covered by the zinc, the reverse took place, and the greatest amount of action occurred underneath the zinc. This happened over and over again, and even when the experiment was varied in different ways, so that the only explanation of the action was that the zinc itself must be able to effect a change of the same kind as the uranium, at all events to act on a photographic plate; and further experiment with zinc alone proved this to be the case; later on it became known to me that M. Colson had already described this action of zinc in a paper in the *Comptes Rendus* in January last, and had also found that similar results could be obtained with cadmium and with magnesium. He explains this remarkable action as due to vapour given off by these metals.

Both before and after seeing the account of Colson's work a large number of experiments have been made with zinc under different conditions, and there is no doubt of the ease and certainty with which the results can be obtained. The zinc, as Colson states, must be bright; if well rubbed with coarse sand paper it is most active; probably this may, to some extent, arise from increase of surface; if cleaned with acid or with caustic alkali it is not so active, and zinc in its ordinary condition after exposure to the air ceases to be active. The salts have also no power of acting in this way. A polished piece of zinc laid on a highly sensitive photographic plate will, under certain conditions, even in four or five hours, so act on it that on development a complete picture of the zinc is produced, showing the scratches or any ruled lines or faint pattern drawn on it, or, if flaws in the metal exist, they are clearly seen. A slight pattern produced on zinc by pressing it on a piece of white net, and then rubbing it down with fine emery or sand paper, will give a picture in which the pattern is very evident. In fact, such a pattern forms a satisfactory test of this action of the zinc. Very slight alterations of the surface are shown in the picture. Absolute contact of metal and plate is not necessary. If screens of different thicknesses of any inactive substance be interposed between plate and metal, thus preventing contact, the action still occurs; if the screen be very thin, a picture of the zinc surface is still obtained, but, if thicker, only a dark, cloudy patch is formed. Still further, if a thick piece of glass tubing an inch long be placed on a photographic plate, and the upper end covered with a piece of polished zinc, in a week to a fortnight distinct action will be found to have taken place below the zinc. Since the action, then, is not one of mere contact, the next point was to ascertain whether it would be transmitted through different solid or liquid media. Glass, even of the thinnest kind, was found to stop the action, but many other substances allow of its transmission. For instance, the action takes place readily through celluloid, sheet gelatine, gutta-percha tissue, collodion, vegetable parchment, real parchment, goldbeater's skin, tracing-paper, and, no doubt, many other bodies. With all these bodies experiments have been made by placing the medium first in contact with the zinc and the photographic plate, then by introducing a screen so as to prevent the medium from touching the zinc, and then placing a second screen so that neither zinc nor plate were in contact with the medium. The screens were made of different materials, most commonly of either white cardboard or sheet indiarubber, and of different thicknesses. The details of each experiment need not be here described; but the general results obtained were that with thin sheet gelatine, either red, green, or blue, when laid on the zinc, the action readily passes through, and a good clear picture of the surface of the zinc is obtained, and even with two sheets of gelatine a similar effect is produced. With thick sheet gelatine interposed the action on the plate still takes place, but, of course, the exposure must be longer. Warm solutions of gelatine were painted on polished zinc and allowed to harden; the action took place through such layers as readily as through the films. With screens used as before described, to prevent contact, the gelatine still allowed the action to take place through it. Thin sheets of celluloid about 0·28 mm. in thickness allowed the action to take place through them, and sheets 0·81 mm. in thickness also allowed the action to be transmitted. Again, gutta-percha tissue was found to act in the same kind of way as the gelatine and celluloid. The other media experimented with, although possibly not so uniform and continuous in structure as the foregoing, also allow this action to be transmitted to them.

Goldbeater's skin and tracing paper both allow the action readily to pass through, and pictures of the zinc are readily obtained. If either of these bodies be placed between a piece of perforated zinc and the plate the perforations are very distinctly shown, or, if they be placed between double screen, with corresponding holes cut, a picture of the holes is readily obtained.

Both vegetable and real parchment are also transparent to this action but not so much so as the previously mentioned substances; the vegetable parchment is more transparent than real parchment. When in contact with the zinc, a picture of the zinc surface is obtained, but this is somewhat modified by the substance of the parchment.

If different kinds of ordinary papers, such as writing and drawing papers, be interposed between polished zinc and a photographic plate interesting results are obtained, for the pictures formed show clearly the structure of the papers, and also show that papers have very different powers of transmitting this action. Certain writing papers are quite opaque to the action; with others, pictures of the structure and the water mark are easily obtained.

The painting a paper with India ink does not destroy its transparency. Obviously pictures of bodies, such as skeleton leaves or dried flowers, &c., are easily obtained in this way.

A mere difference of colour does not appear to alter the absorptive power of a medium; at least, this is the case with gelatine. The thin sheets of gelatine, whether red, green, or blue, have no difference in their absorptive power, and, when gelatine, coloured with aniline dyes, is painted on polished zinc, the colour does not affect the amount of action which takes place. The same thing happens if demy paper be painted with different coloured solutions of gelatine. With ordinary pigments different results are obtained, but these results need not be discussed on the present occasion.

In addition to the metals cadmium and magnesium, mentioned by M. Colson, there are certainly many others which are able to produce effects similar to that produced by zinc. There are also certain alloys which can act in the same way. The following is a rough list of active metallic bodies approximately in the order of their activity: Mercury, magnesium, cadmium, zinc, nickel, aluminium, pewter, fusible metal, lead, bismuth, tin, cobalt, antimony.

The above order, even if not absolutely correct, is sufficiently so to indicate that, although mercury is the most active, the other metals do not follow in the order of their fusibility, or exactly according to any obvious physical property, but most nearly accord to their position in the electrical series. Mercury is, then, at ordinary temperatures, the most active metal, and its action is exercised not only when the photographic plate is placed half an inch or so above the metal, but when gelatine, gutta percha, tracing paper, vegetable parchment are interposed. It appears, however, that the action of the mercury does not take place as readily through gelatine, but more readily through gutta percha than is the case with zinc.

Magnesium is also a very active metal, and very good pictures, showing every scratch on its surface, are easily obtained, and also very marked effects are produced when both single and double screens are used. Cadmium also produces very good pictures, and is rather more active than zinc; nickel and aluminium are not quite so active, but give good pictures; then follow lead, bismuth, and tin. The last metal is by far the least active. Only a few alloys have at present been experimented with; brass gives no action, but ordinary pewter, and fusible metal consisting of lead, bismuth, and tin, were found to have considerable activity, and are placed in the list between aluminium and lead. That certain alloys should act in the same way as the metals is certainly of interest, and probably of considerable importance. The oxide and sulphate, both of zinc and cadmium, were found to be devoid of any power of acting on the photographic plate. Iron, gold, and platinum are not active, and copper only very slightly. All the above results are founded on experiments in which the exposure lasted for one week; with longer exposure other metals will probably produce some action.

In order to determine whether moisture was an active agent, either directly by affecting the medium or indirectly by affecting the photographic plate, experiments were made by exposing the plate under bell jars, in which in one case there was water, and in the other sulphuric acid or calcium chloride, and even in these extreme cases no appreciable difference was found to occur, and, even if the membrane was purposely damped, it did not appear to aid the action except by bringing it closer to the metal, so that aqueous vapour is not apparently an active agent in producing these reactions. In an atmosphere of hydrogen the action takes place as it does in air. Carbon dioxide, under ordinary conditions, does produce an effect, but this probably arises from its action on the zinc plate. Alteration of temperature, on the other hand, produces very marked effects; increase the temperature, and the action of the zinc is greatly increased. For instance, two similar plates, both wrapped in tin-

oil, and the plates separated from the zinc by means of a cardboard rame. One was placed on a water bath, and exposed to a temperature f about 70° C., and the other placed in a vessel of ice at 0° C. After ve hours the one which had been exposed to the high temperature had iven a black picture, while the one at the low temperature gave a picture arely visible. A similar experiment was also made with nickel, and this ave, after heating to about 70°, a good dark picture, but the corresponding xperiment, when the metal was kept at 0° for five hours, gave no picture t all. Aluminium, when treated in the same way, gave at the higher emperature only a faint picture, but at the lower temperature, even fter two days, no picture at all. It has already been mentioned that ais action of the metals cannot pass through even thin glass, nor can it ass through selenite, nor a layer of gum arabic, nor one of paraffin. lass being impervious to the action renders it somewhat difficult to y satisfactorily the action exerted by liquids, but celluloid may be used r this purpose; also mercury may be covered with a thin layer of water, nd then its action entirely ceases. The action of certain salts in the ry state has, however, been tried, by coating non-glazed paper in ifferent solutions, drying it, and then placing it, either with or without screen, between the zinc and the photographic plate. These experi- ients have given some interesting results; for instance, paper soaked in ie following solutions—alum, potassium chromate, zinc sulphate, and inine sulphate, renders the paper quite opaque to the action of the inc.

No doubt, this action of alum accounts for certain papers not allowing ie action to pass through them. Some singular developments of this ibject have arisen from experiments made while examining the metals. piece of polished zinc was coated with copal varnish with the object of certaining whether the action would take place through such a medium, id in case it did, as it was thought at the time, of demonstrating that e action could not arise from metal vapour. The experiment was quite ccessful; the photographic plate, notwithstanding the varnish, was rongly acted on. The experiment was repeated several times, and ways with the same result; but the pictures seemed rather too good, rker than those given by the zinc alone, and, on trying the copal on ain glass instead of on zinc, it proved that effects apparently similar those obtained with zinc were produced. What is known as picture pal answers very well for these experiments. That prepared by insor & Newton has been used. This is painted or poured on a an, warm glass plate, and allowed to harden completely. The plate n then be used in the same way as the zinc plates. If a photographic ate be laid on the hardened varnish for two to seven days, a picture of e varnish, showing the streaks it happens to have dried in, is produced. screens be interposed so as to prevent contact between the copal and e plate, the action still occurs, and, in fact, readily passes down a be one inch long. Therefore, as with the zinc, any figure cut out in inactive screen is readily produced on the photographic plate. Sub- nces which are transparent or opaque to the action of the metals seem act in the same way towards copal. It is rather more active than zinc. ass is perfectly impervious to its action, but celluloid, gutta-percha sue, and gelatine it permeates more readily than zinc does. The tivity of the copal varies considerably under different conditions. If m be sprinkled on a glass plate and then fused, it is not so active as ien picture varnish is used. If the solid gum be dissolved in pure ohol and ether, and applied to a glass plate as before described, it is more active than after fusion. Heating it in a water bath for a con- erable length of time certainly deprives it of a considerable amount of activity; but this can be revived by wetting it with ether, and allowing again to dry at ordinary temperatures. As with zinc, increase of nperature increases its activity to a great extent. Experiments ilar to those with zinc were made with copal. A coated glass was osed to a heat of about 70°, and a similar one was kept at about 0°. is one after five hours gave only a faint picture, whereas the heated e gave a dark picture, and a considerable amount of action took place n through the cardboard screen. Many other bodies of the same ture as copal act in the same way. This has been proved to be the e with Damar and with Canada balsam, but copal seems to be the t representative of the class. Certain gums, such as gum arabic, gum egal, have not the property of acting in this way. There are, how- r, a large number of bodies which have the power of acting in a nner similar to the copal; one of these is wood, and it possesses a y considerable amount of activity. Any ordinary smooth piece of od laid on a photographic plate will act like zinc in impressing its ture on the plate.

W. J. Russell, F.R.S.

(To be continued.)

ON THE AVOIDANCE OF REFLECTIONS.

IV.

previous articles I have endeavoured to point out a few of the nerous difficulties arising from reflections when working in both ide and outside situations. There are, however, a class of reflections t, at all times, are highly prized, for many a beauty spot in a picture nade up of these lovely visitors; and, strange as it may appear to many readers of The British Journal of Photog raphy, there are occasions upon which a photographer is called upon to supply such artificially.

I remember a case in point not long ago, when, being commissioned to execute a large number of photographs to illustrate a work on natural history, being requested to specially work into the pic ture a reflection of the object that was being photographed.

In the case in question, to give the subject its most natural appearance, this was absolutely necessary to be accom plished by some means or other, and, necessity being the mother of inve ntion, I set about thinking how the problem could be solved, a descript ion of which may be of interest to those readers of The British Journal of Photography who care to tackle other work in photography than the mere exposing of plates by a hand camera.

The subject in question was a very fine specimen of a vole's nest, and the naturalist who had been so fortunate as to find this little gem, just at the time it was tenanted with a young family, insisted upon its being reproduced in as nearly as possible the exact manner in which his eye first beheld it. Roaming about the edge of one of the lochs near Glasgow, the nest was discovered just on the brim of the bank, almost over- hanging the water; in fact, had it not been for the reflection of the object on the surface of the water, it is very likely it never would have been discovered—hence the anxiety to so depict this object in the photograph.

After the nest, with its young family, had been carefully treated by the bird-stuffer, it was handed on to me to photograph. A precaution of much value had also been taken by the finder, who took care, when removing the nest, to acquire also its natural surroundings. In the hands of the stuffer this proved of immense value, and went a long way to solve any difficulty regarding a suitable background for the object. So intent was the naturalist on the idea of working in a reflection, as well as a water effect in the reproduction, that he spent no end of trouble and expense in experimenting with artificial ponds and large tubs, &c., but in no case did such satisfy him. At last I persuaded him to leave the nest for a day or so, and I would try what I could do in the interval. I naturally thought of a mirror, and had previously suggested such to my friend, but this mode of treatment did not appear sufficiently natural to him. He could see no other way but real water being utilised.

After several trials, all of which I could plainly see were leading up to the desired end, I was forced to discard the idea of using a mirror, in the strict sense of the term, as understood by the "Looking Glass" article. My attempts, however, had shown me that what was wanted was "a mirror that was transparent, as well as being capable of pro- ducing a reflection of the object," and hence I brought into requisition a large sheet of patent plate glass. This I supported on a deep box, the bottom and sides of which were lined with rough brown paper. The moment the nest was placed over this I saw I had solved the problem, and all that was needed then was merely the placing of the glass and object in the most suitable position in relation to the source of light. This, I eventually found, required the shutting off of all light behind the object; and, after several attempts at different open windows, it was found an oriel window, that permitted light being thrown from exactly in front, as well as somewhat from each sides, yielded the best results.

With these arrangements the plates were exposed, and on my friend seeing the result, he simply stared with amazement, and believes to this day the effect was obtained with the aid of actual water in some utensil or other.

Some of the readers of The British Journal of Photography may imagine that, in using such a thick support as patent plate glass for this purpose, there would be a difficulty to overcome the liability of such to yield a double image reflection arising from the two surfaces of the glass plate. In practice, however, such does not exist; provided the standpoint of the lens is brought to bear upon the object from the exact position, no double reflection will be apparent, and a result obtained, when the picture is trimmed down of its surroundings, that is impossible to detect that such was not obtained from a truly natural source.

The employment of artificial reflection opens up a very wide field of interest to those workers who desire to produce particular effects, but little consideration will be needed for any one to understand that quite a large number of subjects of small dimensions are capable of being made to assume a more natural appearance, by the employment of such or similar means, than by merely photographing the same straight away, without having any regard to the natural surroundings of such or the position they occupy in nature.

This idea to some extent we find carried out by bird-stuffers, not only in the preservation of their specimens, but likewise in their attempts to cause their subjects to appear in as natural positions, or with as natural surroundings, as is possible of attainment, and very striking effects are capable of being produced with the aid of a large sheet of glass when placed in suitable situations in relation to the source of light that is employed to photograph the particular object with.

In the avoidance of reflections when dealing with some particular kinds of subjects, especially those where steel is employed in their manufacture, and where very much will depend upon their being placed in a hard-and- fast position so as to show some expressly desired shape or form, or a variety of such in relation to each other, the shape of the object plays a

very important part in the operation, and such very often causes a lot of trouble to deal with. I can remember a case where it was desired to photograph a steel object in five different positions from the exact same standpoint; the getting rid of the reflections when the object was made to assume a new position was not so difficult when artificial light was employed, but, the moment the reflections from one point were dismissed, another evil was produced of more vital import, viz., the introduction of an actual distortion, or at least the loss of definition of some important lines or edges in the article, the result being that the object was made to assume a somewhat unnatural form or shape when the same was viewed by daylight. After repeated trials and numerous failures, it was found that the only satisfactory method of dealing with subjects of this kind was by actually painting them in a temporary manner with a suitable pigment that entirely got rid of reflections, and which enabled the edges being brought out in bold relief by means of ordinary daylight.

I have known some zinc utensils that gave a lot of trouble, being very successfully dealt with by placing them for a minute or so in a bath of alum and nitric acid, but judgment must be displayed when using such.

With some articles, especially those of considerable dimensions, and whose surfaces are highly polished, as is often met with in large articles of furniture, such as counters, &c., the getting rid of reflected light from one portion is merely followed by the substitution of the evil in as aggravated a form at some other point on its surface; this is very liable to happen when the light comes from a wide area, in my practice I have at times got over trouble of this kind by dusting the entire surface of the article with a suitable powder, according to the colour of the object.

It is a mistake however to suppose that in all instances every semblance of reflection ought to be overcome. Much of the shape and form of certain articles is improved by the introduction of just sufficient high light or contrast to give rotundity or naturalness to the image; it is only when these reflections are seen to assume such an aggravated form as to become actual eyesores and unpleasant in the finished picture that they should be dealt with to the extent of entire removal.

Nothing but downright hard practice can teach an operator how to deal with the thousand-and-one different kinds of subjects that are marred by reflections, and their removal is, in itself, a study of no mean order.

T. N. Armstrong.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM, 1897.

Great Yarmouth Meeting, July 12–17.

The Convention Council Voting Paper.

At a meeting of the Council of the Photographic Convention of the United Kingdom, held at Anderton's Hotel, Fleet-street, on June 24, 1897, it was resolved to nominate the following gentlemen to serve on the new Council (in accordance with Rule 7), to be elected at the Annual General Meeting at Great Yarmouth on July 14, 1897: Sir Howard Grubb, Dublin; Surgeon-Major Adcock, Great Yarmouth; Godfrey Bingley, Leeds; Thomas Bedding, London; C. H. Bothamley, Weston-super-Mare; J. J. Briginshaw, London; F. A. Bridge, London; Alexander Cowan, London; W. Crooke, Edinburgh; Herbert Denison, Leeds; A. Haddon, London; M. J. Harding, Shrewsbury; H. Harvey George, Great Yarmouth; H. M. Hastings, London; A. Horsley Hinton, London; Paul Lange, Liverpool; C. Phipps Lucas, London; Percy Lund, Bradford; J. L. Lyell, London; Major Lysaght, London; George Mason, Glasgow; A. F. Mowll, Liverpool; W. W. Naunton, Shrewsbury; J. Porrit, Leicester; Andrew Pringle, London; H. P. Robinson, London; J. C. Ruthven, Dublin; A. Seaman, Chesterfield; John Stuart, Glasgow; Henry Sturmey, Coventry; W. Taylor, Leicester; Alexander Tate, Belfast; E. J. Wall, London; J. H. Walker, Leeds; H. Snowden Ward, London; G. Watmough Webster, Chester; S. B. Webber, London; W. D. Welford, London; J. B. B. Wellington, London; A. Werner, Dublin.

Members desiring the election of gentlemen other than those on above list will be good enough to place such other names on the list, at the same time striking out a corresponding number of the above names, so that the total number voted for shall not exceed *Forty*. This voting list is to be delivered to the President at the Annual General Meeting at Great Yarmouth on July 14, 1897.

The following is the programme of the week's arrangements:—

Monday, July 12.

Members who have previously communicated with the local Hon. Secretary can join small parties under suitable leadership to see the places of interest in the town and neighbourhood.

The Hon. Secretaries will attend at the Town Hall all day from 10 a.m., and members are particularly requested to report themselves and apply at once for tickets they may require for the various trips during the week.

The Full-dress Reception by the Mayor (Col. H. E. Buxton), and Members of the Reception Committee, will take place at the Town Hall, at 7.30 p.m., and the Convention opened, after which will be given the Presidential Address, and an Exhibition of Lantern Slides, illustrating former Conventions.

Tuesday, July 13.

Excursion No. I. (under the leadership of Dr. D. G. Thompson).—Members will leave the Vauxhall Station, Great Yarmouth, by the train at 9.5 a.m., arriving at Norwich at 9.50 a.m., where the leader of the party will meet them and conduct them to the various places of interest in the City, including the Cathedral (small charge for photographing), Museum, many of the ancient churches, St. Andrew's Hall, &c. Lunch at the "Maid's Head" at 1.30 p.m.

Returning from Thorpe Station at 5.20 p.m., arriving at Yarmouth at 6.4 p.m. Tickets, including return fare and lunch, 5*s*. each.

An Alternative Route to Norwich (under the leadership of Mr. Alfred Price) will leave the Stone Cutters' Quay, Yarmouth, at 9.30 a.m., in a special river steamer, crossing Breydon Water, and proceeding up the River Yare, past Reedham, Hardley Cross, Cantley, Brundall, Brammerton, Postwick, and Thorpe. Lunch with the rest of the party at the "Maid's Head" at 1.30 p.m. Tickets, including return fare and lunch, 5*s*. The tickets issued by the rail are available to return by boat, and those issued by boat are available to return by rail each way.

Excursion No. II. (under the leadership of Mr. Percy Wiltshire)—Members will leave South Quay, Great Yarmouth, at 10 a.m., in the steamer, *Lord Nelson*, and proceed down the harbour to sea, and on to Lowestoft Harbour (about half an hour's trip). Lunch at the "Royal" Hotel at 1.30 p.m. The Mayor of Lowestoft will attend the lunch in his official capacity, and has also kindly invited all members of the Convention to a Strawberry Tea at 4.30 p.m. Returning by the boat leaving at 5 p.m. Return fare, including lunch, 5*s*.

Alternative Route (under the direction of Mr. H. Harvey George).—Members leave the Southtown Station, Great Yarmouth by the train at 10.25 a.m., direct Lowestoft route. Lunch at the Royal Hotel, at 1.30 p.m. Returning by the train leaving Lowestoft at 5.40 p.m. arriving at Yarmouth 6.46 p.m. Return fare, including lunch, 5*s*. each.

Another Alternative Route (under the direction of Mr. G. H. L. Blake)—Members can leave headquarters at 9.30 a.m. in brakes, which will call at the Hall Quay and proceed *viâ* Gorleston to Lowestoft through Somerleyton. Lunch at the Royal Hotel at 1.30 p.m., and returning from the Royal Hotel at 5 p.m. Return fare, including lunch, 5*s*. each.

Papers.—At the Town Hall, at 8. p.m., A Horsley Hinton, Esq. *Methods of Control, and their influence on the ultimate development of Artistic Photography*. Frank Bishop, Esq.: *Photographic Copyright*. Optical Lantern, 9.30 p.m.

Wednesday, July 14.

Annual General Meeting at the Town Hall at 10 a.m.—Election of Council for ensuing year, at 11 a.m., at the Town Hall. The Convention Group will be taken at about 12 noon near the Headquarters.

Afternoon Excursion.—Brakes will leave headquarters at 3, 3.15 and 3.30 p.m. for Caister Castle, under the leadership of Mr. C. Rumbold. Returning from there at 5, 5.15, and 5.30 p.m. Return fare, 1*s*. Excursions may also be made to Gorleston and the Harbour's Mouth and Old Pier.

Annual Dinner and Smoking Concert at the Town Hall at 7.30 p.m. Tickets, not including wine, 5*s*. 6*d*. each.

Thursday, July 15.

Excursion No. I. (under the leadership of Mr. E. J. Humphrey).—Members will leave the Stonecutters' Quay, Yarmouth, at 9.30. a.m., and proceed in a special river steamer up the river Bure, past the village of Stokesby on to Acle, and from thence past St. Benet's Abbey, South Walsham Broad, the river Ant, and to Horning Town and Ferry. At Salhouse Broad a Picnic will be held, and an excellent opportunity afforded to photograph this most picturesque part of the Broad district. After lunch the party will continue by steamer to Wroxham Broad and on to Wroxham Village, returning by train from there, leaving at 5.37 p.m. Return tickets, including lunch, 5*s*. each.

Excursion No. II. (under the leadership of Mr. Henry Newson).—Members will leave the Beach Station, Great Yarmouth, at 9.10 a.m. and proceed to Aylsham, where conveyances will meet the train for the convenience of those who do not care to walk to Blickling Hall. Lunch will be served at the Black Boys Hotel, at 2.30 p.m., and the party will leave Aylsham by the train at 4.50 p.m., arriving at Yarmouth at 5.50 p.m. Return tickets, including lunch, 6*s*. each.

Papers.—In the Town Hall, Great Yarmouth, at 8.30 p.m., T. R. Dallmeyer, Esq.: *The Points of a Lens*. Messrs. Haddon and Grundy: *Strength of Hypo Solution and time of immersion for fixing Albumenised Paper* (Photographic Research Convention Grant Paper). Optical Lantern, 9.30 p.m.

Friday, July 16.

Excursion No. I.—To Oulton Broad and Beccles (under the leadership of Dr. P. H. Emerson).—Leave Stonecutters' Quay by special steamer at 9.30 a.m., and proceeding over Breydon Water and the River Wavene past St. Olave's, Somerleyton on to Oulton Broad. Lunch on board wherry, which will be moored on the Broad, and from which the members will be able to view the yacht racing in the Regatta to be held that day under the management of the Great Yarmouth Yacht Club

The steamer, after leaving those on board the wherry who wish to remain at Oulton, will proceed to Beccles by river, and return to Oulton in time to take on board all those returning to Yarmouth. Return fare, including lunch, 5*s*.

Alternative Route.—By rail from Southtown Station at 10.25 a.m. to Oulton, lunch on board the wherry with the rest of the party; or by brake leaving headquarters at 9.30 a.m., going by road through Gorleston, Hopton, &c., on to Oulton, lunch on board the wherry with the rest of the party. Return fares, either way, including lunch, 5*s*.

Excursion No. II. (under the leadership of Mr. Alfred Price).—Leave Vauxhall Station by the 9.15 a.m. train, arrive 11.54 at Swaffham, where the party will be met by conveyances to convey them to Castleacre (about three miles). Lunch at hotel. Returning from Swaffham at 3.43 p.m. Fare, including rail, carriage, and lunch, 8*s*. each.

Papers.—In Town Hall, Great Yarmouth, at 8 p.m., Wm. Gamble, Esq.: *The Half-tone Process Popularly Explained* (with lantern illustrations). E. J. Wall, Esq.: *Photography in Natural Colours*. Optical lantern, 9.30 p.m.

Saturday, July 17.

Excursion to Ipswich (under the leadership of Mr. F. Woolnough, and the Members of the Photographic Section of the Ipswich Scientific Society).—Ipswich Museum will be the Convention Headquarters (dark room provided). Leave Southtown Station by the 8.15 a.m. train, arrives at Ipswich 9.45. Returning by the train leaving Ipswich at 5.10 p.m., arriving at Yarmouth 6.57 p.m. Return tickets, 4*s*. 5*d*.

(All members who have fortnightly return tickets from London will be allowed to break their journey at Ipswich on Saturday, July 17.)

Places of Interest.

Old Ipswich.—Wolsey's Gate (built 1529) and St. Peter's Church. Pykenham Gate. Christchurch Mansion (built 1549). Christchurch Park. Old Corner Posts. Neptune Inn. Churches. Ancient House (built 1567). Gainsborough Lane, Pond Hall Farm. Old Inns (various).

Modern Ipswich.—Town Hall. Post Office. Museum, Free Library, and Schools of Art. Docks. Promenade, and River Views. Custom House. Tooley's Alms Houses. Arboretum. Grammar School. River Gipping.

Lunch will be provided at the White Horse, Ipswich. Charge, 2*s*. each.

Headquarters for the day.—The Museum, where dark room is provided.

Members of the Ipswich Scientific Society (Photographic Section) will act as guides to visitors to whichever places they may select to visit. All within walking distance, except Gainsborough-lane.

General Information.

Application for membership should be made through the Hon. Secretary, or through the local Hon. Secretary. The subscription is 5*s*. per annum, and is due on January 1 in each year, and carries with it admission to all the meetings and to the Exhibition throughout the week, and liberty to purchase tickets for the excursions.

An Exhibition of Photographs and Photographic Apparatus will be held in the Town Hall, from July 12 to 17 inclusive, between the hours of 9 a.m. and 9 p.m. Members must produce their badges on entering. The public will be admitted on payment of 6*d*. each.

A fine collection of Photographs, illustrating East Anglian scenery and architecture, will be on view during the week. It may be also added that Dr. P. H. Emerson has kindly agreed to contribute a number of his own pictures for exhibition during the Convention, and it is expected that many other well-known workers will be represented.

The Annual General Meeting will be held in the Town Hall, on Wednesday, July 14, at 10 a.m.

The Queen's Hotel, Marine Parade, will be the Headquarters for the Convention during the Meeting.

Group.—The Group will be taken, weather permitting, about noon, adjacent to headquarters, by Mr. Alfred Price and Mr. F. H. Sayers, on Wednesday, July 14. Price, in silver or platinotype, 12 × 10, mounted, 3*s*. 6*d*. each. Enlargements to order.

Dinner and Smoking Concert.—The Dinner will be held at the Town Hall on Wednesday, July 14, at 7 p.m., to be followed by a Smoking Concert. Tickets 5*s*. 6*d*. each, to be obtained of the Hon. Secretaries. Evening dress optional. Ladies will be welcome at the Dinner and Concert.

Members, on arrival, are particularly requested to enter their names, full addresses, and where staying in Great Yarmouth, in the signature book on the Secretaries' table in the Town Hall.

Dark Rooms, Great Yarmouth.—Town Hall (headquarters; for changing only); Mr. Pratt, chemist, King-street (fully equipped for development and changing, and various kinds of plates supplied); Mr. J. Shearman, chemist, King-street (for changing, and various makes of plates supplied; see advt.); Mr. Frank H. Sayers, 26, King-street (for changing); Mr. C. Rumbold, 4, Dene-side (for changing); Mr. W. J. Denew, 10, Regent-street (for changing); Cromwell Hotel, opposite Town Hall (for changing); Messrs. Tilley Bros., 92, Regent-road (for changing); Mr. G. W. Sherman, Regent-road (for changing).

Dark Rooms, Lowestoft.—Messrs. Fryer & Co., chemists, 1, Pier-terrace (for changing, and large stock of plates); Mr. J. W. D. Hume, chemist (for changing and large supply of plates); Mr. H. Jenkins, photographer, 2, Pier-terrace (for changing only); also, Mr. A. Young, photographer, Wellington-road, South Lowestoft.

Facilities for changing plates will be available also in Norwich and Ipswich.

The Thornton-Pickard Company also have very kindly arranged to send a commodious portable dark room with the principal excursions. It will be under the charge of Mr. R. Scott, their representative, who, it will be remembered, had charge of a similar arrangement for Messrs. Watkinson & Co., of Leeds, during the excursions of last year.

Hotels and Tariffs.

Queen's Hotel (Headquarters).—Eighty bedrooms. Eighty to one hundred can dine in coffee-room. Apartments: Sitting-rooms, 5*s*. to 10*s*. per day; bedrooms, 2*s*. 6*d*. to 5*s*. Breakfast, 1*s*. 6*d*., 2*s*., and 2*s*. 6*d*. Table-d'hôte dinner, 4*s*. Teas, 1*s*. 6*d*. Inclusive terms, 12*s*. per day. Two persons in one apartment, 21*s*. per day.

Steam Packet Hotel (Hall Quay).—Twelve bedrooms. Beds, 2*s*. 6*d*. Breakfasts, 1*s*., 1*s*. 6*d*., and 1*s*. 9*d*. Dinners, 1 to 2.30 p.m.; cold, 1*s*. 6*d*. Teas, 9*d*.

Cromwell Temperance Hotel.—Twenty-six bedrooms. Dark room free. Terms: bedroom, 2*s*.; two persons, 3*s*. Tea or breakfast, 1*s*. 3*d*., 1*s*. 6*d*., and 2*s*. Dinner at 1.15 p.m., 2*s*. 6*d*. Bath, 6*d*. Headquarters of C.T.C. Thomas Goate, proprietor.

Brunswick Hotel.—Breakfast, 1*s*. 6*d*. and 2*s*. Dinner, five courses, 2*s*. 6*d*. Teas, 1*s*. to 2*s*. Thirty bedrooms. R. Dodwell, proprietor.

COLOURING PHOTOGRAPHS: SERSHALL'S METHOD.

A coloured photograph, or a photograph with coloured effects, produced and built up according to the invention of Mr. G. J. Sershall, has for its front a thin, transparent plate, preferably of celluloid, and for its back a sheet of paper, cardboard, or other suitable material, whose surface will take coloured printing inks, placed thereon by either the chromo-lithographic process, coloured blockwork, or photo-mechanical means. The inner side of the transparent front to the picture has developed thereon a photographic film, constituting the keystone to the picture, and the inner face of the backing carries upon it the varying tints in colour printing, which blend with the said film to give the desired effect to the finished photograph, the said transparent front and the coloured backing being permanently fixed together, with the film and coloured surface between them, in the process of production, by means of any suitable glutinous material or substance.

In the actual production of a number of these inexpensive coloured photographs, the method of working is as follows:—

Assuming, for illustration, that it is required to produce a considerable number of coloured photographs of the Queen, a negative plate is first made in the ordinary manner, having upon it geometrically set out a number of, say a dozen, subjects or representations, each identical with the other. From this negative plate a sheet of carbon tissue is taken, the same containing twelve representations of the subject identical with each other, the accomplishment of which is by a process well known.

A sheet of transparent celluloid, gelatine, ivory, or talc, large enough to carry the twelve representations, is now taken, and upon this the carbon films, from the sheet of tissue, are developed, the result being twelve representations of the photographic portions of the resultant pictures upon one side of a sheet of transparent material.

Thus, so far in the process, a sheet of photographic films has been produced in a manner well known.

A sheet of transparent gelatine, approximately of the same size as the transparent sheet containing the films, is now placed upon the latter, and provisionally fixed thereto by a number of registering pins, the latter being devices well known in the art. With a sharp-pointed tracing instrument a tracing is then taken upon the gelatine sheet of the outline of the portraits and those parts to be developed by colouring matter, after which the gelatine tracing is taken from the sheet of films, and that face of it containing the depressed tracing lines treated with powdered black lead, so as to fill the depressions therewith. The superfluous powdered lead is then wiped from the surface of the gelatine tracing, and rubbings down or impressions are taken therefrom, upon a number of stones sufficient to comprehend all the colours of the sheet of backings; at the same time the position of the said sheet of tracings is registered upon the said stones by registering pins or points.

The traced parts upon the stones are then drawn according to the well-known chromo-lithographic or photo-mechanical processes, and from the stones or blocks are printed sheets of backings, bearing upon one side the colouring matter for giving the effects, each sheet being registered upon each stone in the colour-printing process, and being formed with

registering holes or their equivalents, so that the sheet of backings will coincide, positively, with the photographic films upon the transparent sheet constituting the sheet of fronts.

Thus we have produced a sheet of transparent photographic fronts having a number of films developed thereon, and a sheet of coloured backings with a like number of coloured representations upon it, both having registering piercings or pins for placing them together, or one upon the other. This last-mentioned is now performed, that is to say, the sheet of coloured backings is placed to coincide with the transparent sheet of films, the latter and also the coloured surface of the backing being inwards, or face to face, and these two sheets are permanently fixed together, in a press, by means of any suitable transparent, adhesive material.

We have now a sheet of a dozen photographs with coloured effects, built up as hereinbefore described, and it is only necessary to cut out the several pictures, or divide up the sheet along each and every dividing line of the photographic films, to give twelve photographic pictures with coloured effects identical in every respect.

The films upon the sheet of celluloid practically constitute the keystones to the ultimate pictures produced, the sheet of coloured backings not forming of themselves the pictures, but only blending with the photographic films, as aforesaid, to obtain the desired finish.

SCOTTISH PIONEERS IN PHOTOGRAPHY.

Lord Beaconsfield once very truly remarked, "In every art it is only the few who can be first class." In the art of photography Thomas Rodger was one of the few—the very few—who, by dint of perseverance and innate artistic tastes, deservedly rose from obscurity to comparative affluence, and earned for himself a more than national reputation.

The eldest son of Thomas Rodger, house painter, young Tom was born in St. Andrew's, April 17, 1832, and received his early education in what was then known as the "West, or Foundation," room of the famous Madras College. After leaving school, Tom, by his own earnest desire, was apprenticed to Dr. Malcolm, chemist and druggist, in whose back shop he, and his fellow apprentice, Dr. George Berwick (now of Sunderland), clandestinely practised their juvenile chemical demonstrations on all available occasions, and made the place rather hot and dangerous to the neighbours with phosphorus and explosive gases.

During his apprenticeship young Rodger attended the chemical classes in the United College, and assisted Dr. Adamson in preparing the necessary experiments for the lectures which were delivered by him during Professor Connell's indisposition.

At that time photography was in its early infancy, but was claiming the attention of scientific men. Its votaries were only struggling with its elementary difficulties. No doubt, Daguerre had to a large extent perfected his process of taking what were called "sun pictures" on silvered plates; but these, although extremely beautiful, could not be multiplied, and were so delicate that they could not bear the slightest touch. It was therefore manifest that the art must stand still unless some other process could be discovered.

A happy idea occurred at this time to Mr. Fox Talbot, an English gentleman, that the union of silver and iodine—the essential combinations in the Daguerre process—could be accomplished in the tissues of paper, and negative pictures obtained, from which an unlimited number of positives could be produced. Mr. Talbot forwarded an account of this calotype (beautiful picture) process to Sir David Brewster, St. Andrew's, who, along with Sir Hugh Lyon Playfair, Provost, Dr. Adamson, his brother Robert, and young Rodger, was an enthusiastic amateur photographer in the classic and ancient city. Rodger soon shot ahead of all his associates, however, and his success was more uniform than theirs. Consequently he was very frequently assisting one or all of them in their difficulties.

Sir David, a frequent and honoured guest at Rossie Priory, read Fox Talbot's communication to Lord Kinnaird and the Rev. Dr. Graham (then of Abernyte, now of Errol), and his lordship, with characteristic enthusiasm, resolved to take up the art and prosecute it. One of the best cameras which could at the time be procured was obtained, the requisite chemicals were got, and with Sir David as their instructor the work of picture-taking was begun.

No photographer, in our days of dry prepared plates, can have any idea of the labour, smudging, and dirt of the process to be undergone in these initiatory times. The paper intended for the negative had to be iodised, washed, and better washed, in tubful after tubful of water, then dried in the dark; it had to be sensitised, exposed, developed, fixed, rewashed again and again, and finally fixed.

As Lord Kinnaird could not afford time to go through the tedious preparatory manipulation, he resolved to procure a student to assist in the work, and keep the apparatus in order. Fortunately Dr. Graham had, through Mr. (now Colonel) Allen of Errol, heard of young Rodger, a promising youth, and at once, at Lord Kinnaird's request, corresponded with Dr. Adamson to learn the terms, &c., on which he would undertake the work. Dr. Adamson dispatched Rodger with a note of introduction, leaving terms, &c., to his lordship's generosity, well knowing that his youthful *protégé* was safe in such hands.

Rodger had not been long at Rossie until he became singularly dexterous in his manipulation, and extremely careful in keeping the apparatus committed to his care in the most perfect order. At Rossie Priory Rodger remained six months, during which time the albumen and collodion processes were discovered, and practised with great ardour Sir David Brewster took the most lively interest in these proceedings, and kept himself abreast of the art, notwithstanding the rapidity of its progress. Rodger was now the chief manipulator, and took the greater number of the negatives, while Lady Kinnaird took the entire superintendence of the printing department, in a suitably fitted up room adjoining the glass studio.

In addition to this, Rodger had assigned him, as a standing job, the photographing of the splendid collection of ancient and modern paintings and statues which adorn the princely halls of Rossie. Among the hosts of visitors upon whom Rodger exercised his art and explained each process were Lord Palmerston, Lord John Russell, Sir Roderick Murchison, &c., and it cannot be doubted that he derived much benefit from the contact. From the nature of his occupation, he was daily drinking into his mind those ideas of beauty and grace which his genius was afterwards to enable him to express in the works of his after-life.

The Rev. Patrick Stevenson, Inverarity, a fellow student, thus describes the scenes that took place in the back garden of a small house near the east end of South-street when Rodger was at first experimenting: "Well do I remember our amusement over the unfortunate beings that were photographed as they tried to look amiable and intellectual as they gazed at nothing—from two to two-and-a-half minutes of exposure under a direct blazing sun—their eyes winking as rapidly as telegraph signals, and watering a rain of tears! Then there came to us the charm that remains as fresh to this hour as it did at first in the dimly lighted closet for developing the pictures. First always come the nose, then the brow, then the hands, detail following detail, till, from the blank yellow sheet of nothingness, there had arisen under the magic power—*now* so well, *then* so little understood—of utterly dark and invisible vibrations, and molecular motions, a likeness perfectly recognisable to practised eyes even in the negative, of the tortured, but now soon-to-be rewarded friend, of the garden and the sunshine, and the winking, and the tears."

Rodger's work in the chemistry class-room was undertaken with a view to the ultimate adoption of the profession of medicine, and for two sessions he did pursue anatomical and other medical studies at the Andersonian University of Glasgow; but—

> "There's a divinity that shapes our ends,
> Rough-hew them how we may."

Dr. Adamson's brother, Robert, had been studying the calotype and other photographic processes with Mr. J. O. Hill, Edinburgh, but died when Rodger returned from Glasgow. Dr. Adamson then strongly urged Rodger to give up the study of medicine and take to photography as a regular profession. After much anxious thought and many consultations with cherished friends, Adamson's advice was taken, and he finally settled in St. Andrew's, where, though often tempted by offers and solicitations to go elsewhere, he remained to the end. The first announcement was to this effect: "Thomas Rodger, Calotypist, has now devoted himself professionally to the work of likeness-taking on all favourable days."

His early training at Rossie now bore good fruit in the perfection and beauty of his work, and speedily attracted public notice. With increasing demands Rodger found it necessary to remove to larger premises, where he found a studio and room for all the arrangements necessary for his profession. "Thomas Rodger, Calotypist," now developed into "Thomas Rodger, Photographer." Work done now was admired and sought by all in the land, and some artists who had long looked on photography with contempt began to see, in the pictures turned out by him, indications of a possibility exceeding in many respects the art of the portrait painter. Others saw in it what was an aid to the cultivation of the public taste, and a help to a better appreciation of their works. The late General Lindsay and the artists who visited in his days at Balcarres were of this last opinion, and accordingly at Balcarres Rodger received not only much encouragement, but much sound artistic instruction in details, which skilled artists know how to appreciate and value.

Mr. Rodger now achieved success and prosperity, and surrounded himself with objects which would have been wholly out of place in his first studio.

Although no great discovery ever fell to his lot, he constantly found out for himself the best methods then discoverable for producing and maintaining the exquisitely fine balances of action between the various chemicals employed, upon which due gradation of shade and tone depends. To do this, when he began, involved no small amount of knowledge, no small capacity of judgment, and no small patience of experiment. Photography nowadays may be pursued almost mechanically—prepared plates, developers, and all the paraphernalia being procurable ready for use on any scale required. *Then* it was very different. The photographer had to make his own gun-cotton, test the purity of his ether and other chemicals, put all together, make his collodion, and work out every detail down even to the best methods of cleaning the glass plates.

It should never be forgotten that Rodger was one of the pioneers of the art, and that many who succeeded in the same owed much to his power of balancing chemical action and to his perfect good nature and willingness to communicate his knowledge at any point in the early history of the art. He was always experimenting in the direction of advance, and not unfrequently along the very lines which led others, more fortunate, though not necessarily cleverer than he, to fame. Notably was this the case in respect to the *carbon* process. He, at an early stage, saw the great practical difficulty, mechanical and otherwise, of obtaining permanent positives from the use of salts of silver or of gold, and turned his attention to *carbon* as a possible vehicle of escape from the difficulty. He had a quick eye for what was beautiful and graceful, and this fitted him for attaining success in choosing a point of view for a landscape, or in arranging single figures or groups in portraiture. His keen perception of light and shade also stood him in good stead throughout. He is acknowledged on all hands to have been a man of extremely sensitive feelings, and his manners were as pleasing as his photographs were admirable. He died January 6, 1883, leaving two sons and two daughters.

DUM SPIRO SPERO.

PHOTOGRAPHIC EXPORTS.

COMPILED FROM THE CUSTOMS ENTRIES.

June, 1897.

Adelaide	£311	Brought forward	£3140	Brought forward	£4149
Alexandria	21	Demerara	16	Melbourne	639
Amsterdam	7	Durban	120	Otago	215
Auckland	380	East London	198	Perth	79
Bombay	828	Flushing	130	Port Elizabeth	153
Boulogne	46	Freemantle	132	Rio Janeiro	51
Brisbane	172	Genoa	49	Santos	10
Buenos Ayres	42	Ghent	15	Shanghai	51
Cairo	33	Hamburg	64	Singapore	86
Calcutta	319	Hong Kong	15	Stockholm	7
Canterbury	25	Invercargill	30	Sydney	607
Capetown	238	Kobe	130	Trinidad	47
Chinde	15	Kurrachee	36	Wanganui	11
Christiania	250	Madras	34	Wellington	120
Christchurch	38	Marseilles	8	Yokohama	514
Colombo	415	Mauritius	32		
				Total	£6739
Carried forward	£3140	Carried forward	£4149		

June, 1896.

Adelaide	£227	Brought forward	£2616	Brought forward	£4584
Auckland	445	Flushing	336	Mauritius	48
Bangkok	72	Fremantle	187	Melbourne	1776
Barcelona	36	Ghent	496	Otago	45
Bilbao	23	Gibraltar	77	Penang	32
Bombay	444	Gothenburg	28	Port Elizabeth	203
Boulogne	174	Hamburg	310	Rangoon	212
Brisbane	265	Hiogo	14	St. John's, N.B.	19
Buenos Ayres	24	Hong Kong	176	St. Petersburg	117
Calcutta	388	Kurrachee	23	Shanghai	356
Cape Town	289	La Tréport	21	Singapore	462
Colombo	12	Lisbon	19	Stockholm	147
Delagoa Bay	16	Lyttleton	16	Sydney	549
Durban	61	Madras	193	Tokio	284
East London	110	Malta	54	Wellington	110
Falkland Isles	30	Manilla	18	Yokohama	221
Carried forward	£2616	Carried forward	£4584	Total	£9165

COLONEL J. WATERHOUSE.

To our contemporary, the *Journal of the Photographic Society of India*, Mr. T. A. Pope contributes the following sympathetic sketch of Colonel Waterhouse, which we are sure will be read with interest by the Colonel's many friends and admirers in this country :—

There is an inexorable rule, applicable to nearly every European servant of the Government in this country (India), which decrees that, on reaching the age of fifty-five, he shall retire on the pension he has earned and leave the duties which he may have performed successfully and with distinction to be carried on by others. In the majority of cases an officer who has reached that age has borne the burden and heat of the day for thirty years or longer, and, feeling himself to be practically played out, accepts the inevitable with equanimity, if not with feelings akin to those of a schoolboy let loose for a long holiday. But in many cases the rule deprives the Government of an officer of long and unique experience; still enjoying vigorous health of body and mind, and full of useful schemes for the better prosecution of the duties intrusted to him; one whose retirement makes a blank which it is almost impossible to fill. No more striking instance of this has ever occurred than the retirement, on May 12, of Colonel James Waterhouse, S.C., after nearly thirty-eight years spent in the service of Government in India, and a career of almost unexampled public and private usefulness. In his case the Government are not the only losers, for it may be said of Colonel Waterhouse that every moment of his leisure time was devoted to energetic participation in the management and affairs of the various scientific institutions in Calcutta. The Indian Museum loses the Chairman of its Board of Trustees, and one who has been associated with it and with every scheme for its improvement since its very inception. The Asiatic Society of Bengal has lost a member and office-bearer of many years' standing, President two years in succession and Vice-President up to the close of his career. As Hon. Secretary to the Committee of Management of the Calcutta Zoological Garden, he has, for the past three years, thrown himself with characteristic energy into the work he found ready to his hand there. Lastly, by his vacation of the post of President of the Photographic Society of India, we lose a most enthusiastic fellow-member, a regular member of the Board of Judges at our annual exhibitions, and a frequent and honoured contributor to the pages of this *Journal*. The cause of photography in India has sustained a loss which we can hardly hope will ever be made up to us, and it is with photography that our late President's name will always be most closely associated.

Colonel Waterhouse obtained his first commission in the old Bengal Artillery at Addiscombe on June 10, 1859, and landed in India and joined the Artillery Depot at Dum-Dum on October 11. From thence he went to Meerut for a while, and from that place he was sent to Saugor, C.P., where he was posted to the 3rd Company, 5th Battalion, Bengal Artillery (afterwards 2/25th R.A.). It was during this period that he first took up photography, then an almost unknown art in India, and his success even in those early days became known to the powers that be, for in January, 1862, he was placed on special duty under the Foreign Department to photograph the tribes of Central India. This occupied him during the whole of 1862. He received the thanks of Government for the very successful performance of what must have been to him a most congenial task, and on the first introduction of photography as a means of map reproduction, in 1866, his photographic acquirements marked him out as the right man to bring the process into practical working in the Survey Office at Calcutta. He was consequently appointed to the department on June 27, 1866, with the rank of Assistant Revenue Surveyor. Photo-zincography had then only recently been invented by Colonel James, of the English Ordnance Survey, and Mr. J. B. N. Hennessey, of the Indian Survey, who had been in England, brought the details of the process and the necessary appliances back with him. Lieutenant Waterhouse joined his new appointment at Dehra Dun, the headquarters of the Trigonometrical Survey, and remained there for a few months working up the process under Mr. Hennessey's direction, and in December, 1886, he came to Calcutta to assume charge of the newly organized Photographic Office, then and for many years afterwards located in No. 1, Wood-street. Here the process was rapidly brought to perfection, with the assistance of a few non-commissioned officers of the Royal Engineers, who had been trained at Southampton under Colonel James.

It is impossible to over-estimate the value of photo-zincography in the rapid and accurate reproduction of maps, and not of maps only but of plans and diagrams of any sort, and it is not surprising that the work found for it increased with great rapidity. New cameras and presses had to be set up, and another house, No. 2, Wood-street, engaged. The large lithographic establishment of the Survey Department (then housed in No. 1, Camac-street), was placed under Lieutenant Waterhouse, in addition to the photographic work, and the double charge gave him ample scope for the exercise of the unwearying desire for improvement which had always characterised him. Soon after his assumption of charge he was compelled by ill health to take furlough, and he took the opportunity while away of visiting the various photographic establishments in England and on the Continent, and gained much valuable information, which he was able to turn to good account on his return. This he embodied in a "Report on the Cartographic Applications of Photography," which the Government ordered to be printed.

From those early days down to the present time Colonel Waterhouse's best energies have been devoted to the improvement and expansion of the work intrusted to him, and to fitting the office to comply with any and every demand that could be made upon it. Having successfully started photo-zincography he at once turned his attention to other processes; collotype, photo-electrotype, photo-typography, and photo-engraving were all tried, and either became recognised features of the office, or were abandoned in favour of something better. Silver and carbon-printing, platinotype, and cyanotype were introduced, and many improvements made in the photo-zincographic work in order to adapt it to the climate of this country. Every reader of this journal is aware of the degree of perfection to which the photo-etching process has been brought under Colonel Waterhouse's supervision. He also found time to carry on systematic researches in scientific photography, on the action of the electric current in development, the reversal of the photographic image by means of thio-carbamides, and in other directions, which gained for him the progress medal of the Photographic Society of Great Britain in 1891. He published many practical papers in photographic journals, and wrote a most useful book on *The Preparation of Drawings for Photographic Reproduction*. It should also be recorded that he was attached

to the Indian Eclipse Exhibition in 1871, to obtain photographs of the corona, and to the expedition for observing the transit of Venus in 1874, while in the following year he was placed in charge of the expedition to the Nicobars to observe the eclipse of April 6, 1875, and received the thanks of Government for his services. Had he remained in India, his valuable experience in work of this kind would almost certainly have been utilised in connexion with the forthcoming total eclipse of January 21 next.

As the work of the offices increased, he was gradually compelled to carry on his experimental work either before or after office hours, and of late years the many calls upon his time practically stopped it altogether; but not until every branch of the work had been brought to absolute perfection To his successor it seems difficult to see where further improvements are needed. For years the work had to be carried on in private houses, with few conveniences and many disadvantages; and it was not till 1890 that Colonel Waterhouse's long-cherished plan of having all his establishments brought into one building, erected for the purpose with all the latest improvements, became an accomplished fact. The plans of the new offices were designed by him almost entirely, and every detail, down to the smallest, received his careful attention. The introduction of steam-printing machinery was due to his representations to Government, and has been a great boon, as for many years it had become increasingly difficult to get through the work with hand presses only.

With all these calls upon his official time, it seems marvellous that any man could have been found willing to devote the whole of his scanty leisure to hard (and honorary) work on behalf of the Indian Museum and the Asiatic Society. Yet, as has already been said, he was for years one of the most painstaking office-bearers that these institutions ever possessed, and he carried into their service his habitual practice of doing everything that he undertook with absolute thoroughness. The Zoological Garden will miss him also; for, though his association with it had been of recent years only, he had managed, *more suo*, to leave his mark upon it in the shape of wisely conceived and much-needed improvements.

THE EASTMAN COMPANY'S NEW PREMISES AT ROCHESTER.

THE *Rochester Democrat* of May 17 gives the following description of the new "Kodak" building:—

"Persons who have occasion to go through State-street, in the vicinity of Platt, and their name is legion, for the past few weeks, have been watching with interest the erection of the handsome new camera works of the Eastman Kodak Company. The building in itself stands as an example of the 'push' of this enterprising corporation. The contract was made on February 5 last, the ground was broken on February 8, and the demolition of the old Smith buildings was begun immediately after. By March 2 the stonework was started, and, March 20, the brick masons took up their trowels. The roof was on sixty-five days after breaking the ground, and thirty-three days from starting the brickwork. Six stories in six weeks! To-day many of the machines are set in place ready for service.

"When the first building was erected, on the corner of Vought-street, many thought that it would be a long time before the Company would need even that amount of factory room, but the quality of the work done by the Company, coupled with efficient advertising, soon made its quarters too small to supply the public with Kodaks and all that appertains thereto. Absolute necessity for more space 'touched the button,' and the firm's business enterprise 'did the rest,' with the result that one of the handsomest and most commodious business structures in the city now stands practically completed. The building presents an attractive appearance even to the casual observer, and is a very decided improvement to the vicinity. Its dimensions are 100 by 117 feet. It is made of stone and brick, and has six spacious floors besides the basement, all well lighted by large windows in the front and back.

"As one enters the building, he is met with two stairways, one leading to the first floor, and the other, a bicycle runaway, to the basement. The visitors on Saturday took the latter, which was provided especially for the *employés*. Here are special rooms for storing the wheels during the day, others for storage of lumber and coal, and still others to be used as kilns for drying the lumber. In the back part of the basement are the engine and boiler rooms, where two Fishkill-Corliss engines, capable of developing 500 horse power, and two 150 return tubular Atlas boilers were in full operation. Two Gould & Worthington hydraulic pumps, for operating the elevators, were also in working order. The large room is used for the heavy wood-working. It contains also an extensive apparatus, which utilates all the exhaust steam from the engines in heating and distributing through the building any amount of fresh out-door air.

"The power for running the machines is distributed through the various floors by vertical shafting, manufactured by the Hill Clutch Company, of Cleveland There are four hydraulic elevators, two for freight and two for passengers. Aside from these there are two dumb waiters running from the basement to the roof, by which tools and small materials for the camera workers may be conveyed from floor to floor.

"In following the construction of the camera, one must go to the second floor from the basement. Here are two large rooms, where all the metal attachments are made. The machines for drilling and punching the brass and aluminium are said to be of the costliest construction. They are arranged symmetrically, and everything suggests convenience for the workmen, so that the work is gotten out with the greatest possible dispatch. The third, fourth, and fifth floors are alike in construction, containing machines for the light wood working, benches for the cabinet-makers and polishers. On the sixth floor most of the finishing and assembling is done, and the cameras are taken thence to the first floor, where the leather covering is put in place. The main offices are arranged on the ground floor also, just at the left as one enters the door.

"The building is said to be absolutely fireproof. It is of heavy mill slow burning construction. There are no pockets so called, and separating the old and new parts is a fire-proof section, fifteen feet wide, and a hundred feet long, seven stories high. It contains the elevator wells and the stairways, with fireproof vaults on each floor, where the tools are to be kept. The tools used by the camera workers are of the most valuable kind, and a great deal of care is taken of them. This section is of the most careful construction, The stairways are of iron and stone, the floors are of concrete, and the iron floor beams are all cased in terra cotta. The section is in itself a very efficient fire escape."

Our Editorial Table.

FROM the London Etching Company, of 3, Holborn-place, E.C., we have received several specimens of their work in half-tone etching. The prints, which are beautifully executed, do the fullest justice to the blocks, which have evidently been produced with great care.

MESSRS. FLOOD & SON, The Grove, Lowestoft, have issued a small illustrated book, which includes a list of the Lowestoft exhibits at the Yachting and Fisheries' Exhibition, now open at the Imperial Institute, South Kensington. The book chiefly consists of an illustrated souvenir of Lowestoft, in which the many attractions of that delightful town are set forth for the edification and allurement of visitors.

CATALOGUE RECEIVED.

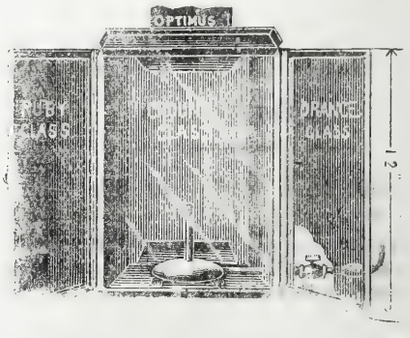
Wilfred Emery, 3, Soho-street, W.

MR. EMERY'S catalogue describes and illustrates the "Apex" hand camera, cameras and lenses for stand work, and other photographic requirements.

THE OPTIMUS DARK-ROOM LAMP.

Perken, Son, & Rayment, Hatton-garden.

THE principles upon which this lamp are constructed are such as to render it of great practical service for dark-room work, and, having had it in actual use, we can testify to its utility. It is made for gas, and has a ventilating shaft, not shown in the cut. The interior is japanned white, by which means loss of light is largely obviated. It



will be observed that movable windows, of ground, ruby, and orange glass, are fitted to the lamp, an arrangement which allows of the colour of the light being varied at will, a great convenience to those whose photographic operations include the manipulation of bromide paper, orthochromatic and very sensitive plates, &c. We can strongly recommend the lamp.

LONDON TOWN: THE "DAILY MAIL" GUIDE TO LONDON.

[Published by Beechings, Limited, 174, Strand W.C.]

THE compilers of this book, which sells at sixpence, have condensed an enormous amount of information relating to the metropolis, and have served it up in an attractive and easily comprehensible style.

the stranger within the gates of the capital it should prove very eful; while the resident, who knows his London well, may easily pplement his knowledge from the vast amount of detailed rticulars of the great city therein given. Many illustrations adorn e book, amongst them being some reproductions from admirable otographs taken by Mr. Alfred Ellis, of Upper Baker-street, W.

Tunbridge Wells of To-day.

[Published by Beechings, Limited, 174, Strand, W.C.]

UNBRIDGE WELLS and the charming district of which it is the ntre are fully described in this excellent guide book, which is well oduced by the printers, and appreciatively written by the authors, essrs. W. S. Martin and B. P. Row. Mr. Glanville, Mr. Lankester, d other local photographers, have their views capitally reproduced the book, which, though it professes only to tell of Tunbridge Vells of to-day, has much interesting historical lore. Sojourners in ie neighbourhood will find the book well worth possession and udy.

The Ilford Special Rapid Plates.

Manufactured by the Britannia Works Company, Ilford.

OMPARED with the Ordinary plates of the Britannia Works Company's manufacture, the Special Rapid plates are claimed to have our times the rapidity, which, we are of opinion, is under rather an over the mark, the more especially as in our hands some of ie Special Rapid plates that we recently tried stood a test for apidity which placed them in the very front rank for extreme peed. The makers quite fairly claim fineness of the grain as a haracteristic of the plates, but they also possess the valuable dditional feature of developing entirely free from fog, a point of ery considerable importance, having regard to the circumstance hat it is easy in special cases to mistake fog as an indication of reat rapidity. We do not desire a quicker or better-made plate han the Ilford Special Rapid, which should prove popular among hose with whom high-speeded plates are *desiderata*.

Geschichte und Theorie des Photographischen Teleobjectivs.

Verlag der Deutschen Photographen Zeitung, Weimar.

HIS monograph, by Dr. Moritz von Rohr is, doubtless, the most omplete treatise on the tele-photo lens hitherto published. The irst section gives a very interesting historical account of its construction. The use of a negative lens for magnification of the image s traced back to P. Barlow, whilst the credit of constructing the irst tele-photo lens is given to an Italian engineer, J. Porro, who hotographed a solar eclipse on July 28, 1851, and named the lens n "objectif sthénallatique." The work of T. R. Dallmeyer finds lue recognition, and we are glad to see an acknowledgment of the agacity of the late Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, J. Traill Taylor, who drew attention, in 1873 and 1877, to he combination of a positive with a negative lens for the production of enlarged images, and indicated the true theory of the system. The author gives a valuable analysis of the optical conditions peculiar to tele-photo lenses, and the work is of great interest to those who have taken up this branch of photography.

News and Notes.

CHANGE OF ADDRESS.—Mr. J. Weir Brown has removed to 71, Marina, St. Leonard's-on-Sea.

MESSRS. MILNE & Co. have removed to larger and more convenient premises at 47, Bedford-hill, Balham, S.W.

THE name of Mr. H. Flather, who took the prize in Class K at the Printers' Exhibition, was last week erroneously given as Flatter.

IT is stated that a Bill has been introduced in the Minnesota Legislature providing for the appointment of expert witnesses, and that a similar Bill has been prepared to be presented to the New York Legislature. The object of the Bill is to provide a list of experts, from whom witnesses are to be selected by the Court and paid by the State.

THE Albert Medal for the present year has been awarded, with the approval of H.R.H. the Prince of Wales, the President of the Society of Arts, to Mr. G. J. Symons, F.R.S., "for the services he has rendered to the United Kingdom by affording to engineers engaged in the water supply and the sewage of towns a trustworthy basis for their work, by establishing and carrying on, during nearly forty years, systematic observations (now at over 3000 stations) of the rainfall of the British Isles, and by recording, tabulating, and graphically indicating the results of these observations in the annual volumes published by himself."

MESSRS. FUERST BROTHERS, of 17, Philpot-lane, have now for sale Lumière's Jubilee Procession Films as follows: *The Royal Procession*—No. 490 Her Majesty the Queen and her Escort. No. 491. The Foreign Princes and Nobility. No. 492. The Foreign Envoys (Ambassadors). No. 493. The Life Guards and Band of the Dragoon Guards. No. 494. The Naval Field Battery and Guns. No. 495. The Colonial Premiers and Colonial Troops. No. 496. The Royal Horse Artillery with Guns. Also the following: No. 488. Her Majesty the Queen's Arrival from Windsor at Paddington. No. 489. The Crowd following after the Queen's carriages.

"As might have been expected, says the *Photo-American*, the demand for materials for the radiotint method of colour photography, which we announced last month as having been secured for the Americans by the wide-awake firm of Anthony & Co. has been fairly overwhelming. Those who remit cash in advance and become tired of waiting, in case there be any delay in getting the goods, will be at perfect liberty to withdraw their money at any time, but will, of course, lose their place in line. The liquids will be put up in sets as follows: Sufficient liquids to colour 50 cabinet prints, 5 dollars. Sufficient liquids to colour 200 cabinet prints, 20 dollars. Sufficient liquids to colour 800 cabinet prints, 70 dollars."

THE proprietors of the *Ludgate*, in view of the success of the last Photographic Competition, have decided to again offer cash prizes and medals to the successful competitors. The subjects are as follows:—Hand camera: 1. General Competition, first prize, 1*l.* 1*s.* and medal; second, 10*s.* 6*d.*, third, 7*s.* 6*d.* 2. Animal Life, first prize, 1*l.* 1*s.* and medal; second, 10*s.* 6*d.*; third, 7*s.* 6*d.* 3. Marine Subjects, first prize, 1*l.* 1*s.* and medal; second, 10*s.* 6*d.*; third, 7*s.* 6*d.* 4. Humorous Subjects, first prize, 1*l.* 1*s.* and medal; second, 10*s.* 6*d.*; third, 7*s.* 6*d.* 5. Child Life, first prize, 1*l.* 1*s.* and medal; second, 10*s.* 6*d.*; third, 7*s.* 6*d.* Stand camera: 1. General Competition, first prize, 2*l.* 2*s.*; second, 1*l.* 1*s.*; third, medal. 2. Humorous Subjects, first prize, 2*l.* 2*s.*; second, 1*l.* 1*s.*; third, medal. 3. Child Life, first prize, 2*l.* 2*s.*; second, 1*l.* 1*s.*; third, medal.

HOW A JUBILEE PARTY WERE PHOTOGRAPHED.—Charles Wallen, aged thirty-eight, of Ernest-street, Notting Hill Gate, was charged before Mr. Curtis Bennett, at the Marylebone Police Court, with assaulting Philip Cook. Mr. Freke Palmer, who appeared for the prosecution, stated that, in view of the continuance of the Jubilee festivities in London, his client invited a number of friends to visit him, and, by way of celebrating the event, he called in a photographer to photograph his party, who were arranged on the private ground in front of the Champion, Wellington-terrace, Bayswater. Just as the photographer had finished arranging the party, the prisoner, who was the worse for drink, obtruded himself upon them, and insisted upon standing between two ladies. Mr. Cook objected, and took hold of prisoner and led him away, but he returned, and was afterwards removed three times before the photographer could proceed with his work. He was removed firmly but kindly, as prosecutor did not consider that prisoner would add to the beauty of the picture. Suddenly prisoner again returned to the party, and dealt prosecutor a heavy blow on the mouth, damaging it so much that he could only give his evidence with difficulty. A police constable was then called, and the prisoner was then given into custody. As the prisoner bore ten years' good character, he was let off with a fine of 20*s.* and 23*s.* costs, or in default one month's imprisonment. The defendant's employer paid the money.

"FURTHER applications of the Röntgen rays to light luggage," says the *Daily Telegraph*, "were made last week at the Ministry of Finance in Paris, by means of the apparatus called 'La Lorgnette Humaine,' invented or perfected by M. Gaston Séguy, an engineer employed in the Higher Pharmacy School of Paris. The experiments were carried out by M. Pallain, Director-General of Customs, and other officials. Thirty posted packets were inspected in a quarter of an hour without any opening or unsealing. The persons present saw distinctly, by means of the X rays, hats, dolls, watches, boots, fruits, musical instruments, and other articles inside the packets. Frauds were also detected, amid much amusement. Thus, a package labelled 'discarded linen' contained three boxes of Egyptian cigarettes and a considerable quantity of English matches. Another packet held surgical instruments, which are free from duty, but with them were certain articles liable to the attention of the Customs people. It was curious to observe that in one box, known to contain lambskin gloves, only the metal buttons and the tissue paper around them were made visible by the rays. A Customs official, during the progress of the experiments, gave it as his opinion that the apparatus, while extremely useful, would be necessarily limited in its action, for it could not disclose all the objects in a trunk, nor those thickly covered over. Neither could it enable a searcher to discern an old from a new article. The official, however, opined that the apparatus invented or perfected by M. Séguy would be of great utility in detecting dutiable articles in packets, and would save the searchers a good deal of time. This would notably be the case in dealing with enclosures sent from Algeria and containing tobacco, which does not enter France duty free from the African colony. Thus, the Röntgen rays are destined to be the especial terror of the contrabandists, who, objecting to the State monopoly of the weed, try to smuggle cigars, cigarettes, bird's-eye, and canaster-tabak into France from England, Germany, and Belgium, or who endeavour to introduce Algerian samples of what was originally called in this country 'nicotiane.' Other land smugglers, too, will have to beware, notably those who periodically deceive the Octroi men or municipal toll-gatherers at the gates of Paris. Women coming into the metropolis from the outer suburbs with bottles of wine and cognac, or with other taxable articles concealed under their petticoats, will now have to look out for the Röntgen rays as they approach the Octroi men, so that in time such a thing as defrauding the Customs or the municipality will be unknown."

REVIVAL OF WOOD-ENGRAVING AND LITHOGRAPHY.—*Illustration during the Reign* was the subject of the second of the series of lectures at the Printing Exhibition at the Agricultural Hall, delivered by Mr. Frank Colebrook, editor of

the *Printing Times*. Mr. Charles T. Dodd, art instructor of the Hartley Institute, Southampton, who presided, pleaded for the impress of the artist's personality in all illustration. Mechanical aids should not be sought at the expense of artistic quality. Mr. Colebrook said the illustrator was a much greater man than was commonly thought. Mr. Gleeson White had finely said that, when the roll-call of great nineteenth-century artists is called, there will be many without the fold of our noble Academy who, nevertheless, will answer, "Adsum." A true artist was himself, whatever his medium and wherever his work appeared. Millais was Millais, whether painting for the Academy or drawing an intensely powerful wood-engraving for *Once a Week* in the sixties. In that golden age of illustration men and women were so well portrayed by certain master hands that it passed the power of crinolines or peg-top trousers to make the one or the other look ridiculous. In 1874 came the extravagant use of cheap electros of foreign illustrations, extravagant, since it cost three journals their lives in a few months, just as the unqualified use of mere photographic blocks, ungraven by hand, would probably prove a fatal economy to other journals of to-day, for the public now wanted good work It might be "process." We must not bow down to "wood" or to "stone," but, whatever was the medium, the quality must be high. "Acid," without assiduity, would not long find favour. Some firms knew this, and were spending, in the employment of wood-engravers to touch up "process" blocks, sums which would have gone a good way towards paying for wood-engravings instead of "process." Of art lithography, Mr. Colebrook said it was very little, if at all, more cheaply done in Germany than in England. The German worker's many pains, and not his few pence, were our danger. The men who sent over from the Continent oilochromes in thirty-six colours about twenty years ago had the same thoroughness to-day. It showed itself differently—in posters, for one department. The foreign posters on London hoardings to-day—computed at 200,000—were in very many cases American presswork under the influence of German artists, who had left London for a more lucrative sphere across the Atlantic. Mr. Colebrook concluded that both wood-engraving and lithography were reviving. Perhaps the Royal Academy could foster the revival, and, if Academy students, who felt that creative work was not their forte, would listen to Mr. Biscombe Gardner, and would bring their native talent and splendid training to the service of these arts, for the reproduction of other men's masterpieces, every one might be benefited. Of such artists the more the merrier. Mr. Colebrook spoke of the practicability of doing illustrations in colours, with accompanying black letter-press, at a moderately fast rate, in one machine working. He supposed our dailies, in course of years, would be tempted by colour work, though good black and white were means with which one could practically paint. Mr. J. M. Rudd trusted our dailies would never resort to colour work on fast presses. The results would probably be hideous, like those obtained by American dailies, which were now making the attempt.

Patent News.

The following applications for Patents were made between June 23 and June 30, 1897:—

Wrapper.—No. 14,986. "An Improved Wrapper for Photographic Paper, Plates, and similar Materials." G. Lee.

Vignetting.—No. 15,087. "Improvements in Vignetting Apparatus." Complete specification. E. A. Harris and E. J. Eyres.

Cameras.—No. 15,256. "Improvements in or relating to Photographic Cameras." Complete specification. E. P. Pasquier.

Roll-holders.—No. 15,257. "Improvements in or relating to Roll-holders or Chambers of Photographic Cameras." E. P. Pasquier.

Film-carriers.—No. 15,277. "Improvements in Photographic Film-carriers and the Manufacture thereof." J. E. Thornton.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
12	Bradford Photo. Society	Open Night.
13	Birmingham Photo. Society	Opening of New Rooms at Athletic Institute, John Bright-street.
13	Hackney	*The Weather Charts in our Daily Papers, and What they Teach us.* J. Wilmer-Cole.
14	Photographic Club	Open Night.
15	Bradford Camera Club	Result and Discussion on Competition.
15	Polytechnic	Visit to the Sandell Exhibition.
17	Birmingham Photo. Society	Excursion: Tutbury. Leader, R. Haines.
17	Hackney	Excursion: Zoological Gardens. Leader, W. L. Barker.
17	Oldham	Excursion: Alton Towers. Leader, S. Ashton.
17	Wolverhampton	Excursion: Stratford and Charlecote Park. Leader, H. E. Perry.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 1,—Mr. R. Beckett in the chair.

Mr. F. E. Freshwater said he had endeavoured to procure prints from some of the many negatives which must have been taken during the recent Jubilee celebrations for the inspection of the members. Amongst them were a series of eighteen by Mr. Charles S. Wallis, taken from some premises in Cheapside; also a print and an 18×14 enlargement from a film negati (Austin-Edwards double instantaneous) taken with a Beck Autograph rap rectilinear lens, of thirteen inches focus, at *f*-22, with an exposure of or sixteenth of a second. The print and enlargement which depicted a porti of the scene in St. Paul's Churchyard were kindly lent by R. & J. Bec Limited.

The Chairman passed round an album of snap-shot pictures taken at Hy Park Corner, containing twenty-five prints out of twenty-seven exposur which he thought a good percentage.

There were also shown two photographs, taken within a minute or two one another, of a crowded street scene, comparing the work of the Dallmey stigmatic lens, aperture *f* 6, focus 7·6 inches, with another make. Sor discussion ensued on the conditions of the test.

The Chairman, in answer to an inquiry, said the stigmatic lens was improvement on the anastigmat, having a negative lens at the back with air space, maintaining the old Petzval idea, and getting rid of all spheri aberration.

Mr. Bayston showed some photographs of the illuminations, exposed six minutes at *f*-22 soon after nine in the evening. The subjects were t Bank of England and the building of the North British Insurance Compar He also had a print of the beacon on Hampstead Heath obtained from t negatives, one of the fire itself and the other of the structure taken in t daytime, and combined.

A short discussion took place on the merits of the pictures shown, it bei generally thought that the selection of the points of view had been unsat factory, some of the prints having been taken almost perpendicular downwards from the upper windows. At the same time the difficulty doing better under the circumstances was recognised.

The Chairman welcomed Professor Stebbing, of Paris, who was present the meeting.

Professor Stebbing, in a few words, expressed his pleasure for the ki reception he had met with. He was sorry he had nothing photographic communicate, as it had not been his primary intention, in visiting England, come to the London and Provincial Photographic Association, of which was an honorary member, but to see the Jubilee. He said it would be great pleasure to him to be able to welcome any of the members visiti Paris.

PHOTOGRAPHIC CLUB.

July 1,—Mr. T. Bedding in the chair.

Mr. Foxlee showed some of the adhesive plaster which he used for fast ing exposed plates together. His idea was to fasten the plates together fi to film, and then bind the edges with the adhesive rubber plaster.

Mr. Washington Teesdale, F.R.A.S., said he had been in the habit fo number of years of replacing his exposed plates in their original packag packing the plates face to back. He never had a plate scratched.

Mr. Bridge referred to a case where complete disaster had followed t practice referred to.

Mr. Teesdale enumerated his ideas upon exposure, which rather surpris some of those present. He said that he thought that a series of identi exposures given with every stop of a lens would be quite capable of bei developed into such a series of negatives that it would be difficult impossible to distinguish one from the other. He strongly recommended t use of moderately rapid plates for all purposes, speaking unfavourably of t most rapid ones. Mr. Teesdale expressed his opinion that anything wh could be photographed upon a rapid plate could be equally well photograph upon a slow plate.

Some of the members dissenting, Mr. Teesdale asked for an example.

Mr. Bridge said that, in photographing, say, a workroom with hea shadows and work girls in white aprons and black dresses, the use of a sl plate would be impossible.

Mr. Fry said that, if Mr. Teesdale would try to copy a photograph wh had been toned to a red colour, both upon a very slow plate and also upo rapid one, he would gain an experience which might modify his expres views.

Messrs. Wallis, Dowell, and Welford showed examples of Jubilee proces work.

The meetings of the Club during July and August being of an inform character, no minutes will appear in the press.

Hackney Photographic Society.—June 29, Mr. Beckett in the chair. The evening was spent in a chatty manner, and exhibiting lantern slides Messrs. Carpenter, Roofe, Hensler, Dean, Fenton-Jones, Selfe, and othe including pictures of the Jubilee procession by Mr. Hindsley. The Excursi Secretary also read reports of excursions to Molesey, Maldon, and Bro bourne.

North Middlesex Photographic Society.—June 28, Mr. E. R. Matto in the chair.—Mr. E. W. Hickcox was elected a member of the Society, a Mr. R. B. Heard was nominated. Mr. J. W. Marchant then read a lecture Mr. J. A. Hodges, F.R.P.S., on

Lantern-slide Making.

The paper dealt exhaustively on the making of gelatine lantern slides, th development, and after-treatment, and the slides which accompanied t lecture added emphasis to what was said, showing the result of a reduci agent, and the appearance of an under-exposed, a correct, and over-expos slide developed in a normal developer, and many others. The length of t paper precluded much discussion, but the effect of different-shaped marks a slide, spoken of by Mr. Hodges, was brought up, and Mr. MacInto favoured Belitski's reducer of potassio-ferric oxalate rather than ferric chlori recommended by the lecturer. A vote of thanks to Mr. Marchant for excellent rendering of the paper, and to Mr. Hodges, concluded the meeting.

July 5, Mr. Mummery in the chair.—Mr. Mattocks gave an account of t

ting to Harpenden on Saturday last. Twelve members attended, but not any plates were exposed. A discussion on developers arose out of a question r one of the members, several describing their mode of procedure, and re- rence was made to the new tables by Messrs. Clarke and Ferrero, in which the uantities of pyro ammonia, &c., in most of the well-known formulæ are com- ared. Backing plates was the next subject of discussion. Plates coated with ained collodion were not recommended if for use in sheaths, as it was liable easily chip off. Caramel-backed plates did not suffer from this defect. he Sixth Lantern-slide Competition only brought a small number of slides, obably owing to the time of year, but it was made up in quality, Mr. A. H. sett gaining first place with a beautiful interior figure subject entitled *Stolen leasure*, Mr. Mattocks gaining second place with a seascape, *A Passing leam*. In the Benfleet Outing Competition Messrs. Smith and Mummery ed for first place, Mr. Mattocks being placed second.

Photographic Guild.—The first Council meeting of the Photographic Guild as held in London on Wednesday, June 30, when the principal business was he appointment of officers. The election resulted in the following Council:—*President:* Mr. Leon Warnerke.—*Vice-Presidents:* Messrs. Jerome Harrison nd Alfred Watkins. *Committee:* Mr. T Bromwich, Mr. T. S. Muspratt Hall, Miss Nevile, Mr. A. W. Cobbold, Mr. J. S. Sunderland, Mr. S. L. oulthurst, Mr. Carl Hentschel, Mr. C. Welborne Piper, Mr. L J. Montefiore, Ir. R. H. Hobart Cust, Dr. A. Marsh, Mrs. Catharine Weed Ward, and Mr. ercy Sinnatt.—*Librarian:* Mr. F. G. Archer.—*Curator:* Mr. C. F. ownsend.—*Treasurer:* Mr. H. J. L. J. Massé.—*Hon. Secretary:* Mr. H. nowden Ward. The different officers at once proceeded to the work of heir departments, and the Council passed by-laws for the control of the irculating library, of the loan collection of photographic apparatus, &c.

Bradford Camera Club.—At the last weekly meeting there was a large ttendance of members to hear Mr. C. C. Vevers' (Leeds) popular lecture on

LENSES.

Ir. Vevers treated his subject very fully, and illustrated his remarks with iagrams. Mr. W. W. Dawson (Vice-President) presided, and the lecturer was corded a hearty vote of thanks.

Bradford Photographic Society.—A well-attended meeting was held at he Unity Rooms on Monday night, when Mr. SWAIN opened a discussion pon

DEVELOPMENT,

Mr. P. E. Newstead occupying the chair. Mr. Swain, in his remarks, ouched upon the evils of under-exposure, and gave his experiences, which howed that he leaned towards the tentative development system, using a ery weak solution indeed to begin with, and afterwards employing the ormal developer to get density. Mr. Swain also gave some interesting nformation with regard to the ferrous-oxalate method, and showed one or wo really capital negatives made by this neglected solution Considerable liscussion then arose on various matters touching on the subject, the main ne being sustained by Mr. STEPHENSON, who gave it as his opinion that og during development was impossible, provided a perfectly safe light had been used, while Messrs. BELL and DAWSON, on the other hand, averred that, even if the film had not been exposed to the slightest white light, it was possible to completely veil, and, so to speak, develop it, a chemical action or oxidation being the cause. At the close of the meeting two new members were proposed, and a hearty vote of thanks given to the opener of the debate and the Chairman. The latter suitably responded.

Prescot Photographic Association.—On Monday evening, June 28, the First General Meeting of the Prescot Photographic Association was held at the Royal Hotel. Mr. Blaiklock occupied the chair.—A set of rules were drawn up, and it was decided to call the Association the Prescot and District Amateur Photographic Association. It was also decided that the subscription should be 5*s.* per annum. On the proposal of Mr. TRACEY, seconded by Mr. TAYLOR, Mr. Langley was appointed Hon. Secretary. The following gentlemen were elected members of the Committee: Messrs. J. Blaiklock (Chairman), F. V. Driffield (Vice-Chairman), A. Tracey, C. Willis, T. Davies, J. Martin, F. R. Thomas, J. Whitaker, and J. S. Robinson. Mr. C. Willis was appointed Treasurer. Mr. E. J. Taylor was appointed Auditor.

FORTHCOMING EXHIBITIONS.

1897.		
Sept. 1–Oct. 13	Glasgow International.	W. Goodwin, 3, Lynedoch-street, Glasgow.
„ 27–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Hanover square, W.
December 9–11	Aintree Photographic Society.	

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I have had a good many inquiries addressed to me about the Dansac-Chassagne process, and, as I was to a large extent responsible for having drawn public attention in this country to the process, I am naturally anxious that those who feel an interest in the subject should have, at all events, such information about it as I can supply without a breach of the confidence I have been favoured with.

First let me say that the information I can publish does not include any details as to the materials employed or the method of their manufacture. The process is to be worked as a secret one, and the statements made to me as to the method of preparing the liquids used were confidential. This, of course, greatly affects the scientific interest of the question, but commercial considerations in this, as in many like cases, overpower scientific interest.

It is only quite lately that I have been able to make any fuller examination of the process, and such rough tests as I have made are very incomplete. They are, however, complete enough for me to say that, while they do not justify the claims originally put forward as to the completely automatic nature of the process, I yet cannot account for the results produced without admitting that the selective action claimed does to some extent exist; that the colouring matters applied to the photographic print have a certain tendency to attach themselves to those portions of the print which would be of a similar colour had the image been reproduced in natural colours, and also that the colouring matters, when applied in succession, do so combine or react on each other as to reproduce, approximately, the tones or tints of the original.

There are also some other inaccuracies in the first description given to me which I should like to correct. It does not appear to me that a special negative, or a special print, is any advantage. It certainly is not necessary. The process can be applied to an ordinary print on albumenised paper, or to any positive on an ordinary gelatine plate. It does not appear to work successfully with some, at all events, of the more modern printing-out papers; nor is it a fact that during the process of treatment the positive has to be exposed to bright light.

This, it will be said, is different from the process as it was first described. Precisely. It is because of that difference, and because I was responsible for the publication of the first description, that I now ask you to allow me to inform your readers as to the real value of the process so far as I can estimate it at present.

The above conclusions are based on my own attempts and some (rather more successful) by my friend, Mr. Herbert Jackson. Judging from the work of the skilled operators whom I have watched in M. Chassagne's studio, I can only say that in their hands the process is certainly not entirely automatic. The operator requires to know generally what the colours should be, and the results largely depend on his judgment and skill in applying the colour in the right places.

But the practical outcome is that anybody, after a little instruction, can produce, with very great rapidity, coloured pictures which, as evidenced by the specimens shown in public, are of considerable merit. The result is obtained by first applying the liquids over the whole picture, and then working up the different parts of the picture by applying them locally. About the truth of this there can be no manner of doubt. Hundreds of persons in Paris have seen it done, and have admired the results. The difficulty is to satisfy oneself as to how far the process is purely mechanical and how far it is a matter of skill. A certain amount of skill is required; but, admitting this, it appears to me that, taking it at its lowest value, the process does provide a means of colouring photographs, and with approximate correctness, that has not previously been available.

Whatever may be the practical or commercial value of the process, it will prove of very great theoretical interest if, as an outcome, it should be conclusively proved that any monochrome photograph has even the smallest power of colour selection depending on the tints of the original, as, this once established, some of our current photographic notions would be revolutionised.—I am, yours, &c., HENRY TRUEMAN WOOD.

"PATENT APPLIED FOR."

To the EDITORS.

GENTLEMEN,—In your issue of July 2nd you have very clearly set forth the law on the above subject, but it would be a most unsafe assumption to suppose that this law is observed in the slightest degree. I have in my possession goods, not only marked patent, but with dates of patents stated, although a search in the patent indices does not show that any patent has been granted at the dates named for goods of that description. The British public are very ignorant of what has been done in times past even in connexion with their own businesses, and are very ready to believe that an article is new and protected by patent, when it is really neither one nor the other. It may be asked how this can be? The reply is simple. There is no public official to enforce the observance of the law, and private individuals are averse to fighting the battles of the public. Some years ago Colonel Eyre asked a question in the House as

to foreign goods marked patent, but not patented in England, being allowed to pass the Custom Houses. A promise was given that it should be stopped, but nothing effectual was done. A little ventilation of the subject of practicable monopolies supported by pretended or invalid patents might have a very good effect.—I am yours, &c.,

July 3, 1897. CHARLES LOUIS HETT.

THE NEW ERA IN LENS CONSTRUCTION.

To the EDITORS.

GENTLEMEN,—I have carefully studied Messrs. Taylor, Taylor, & Hobson's pamphlet, and fail to find any claim that the "Cooke" was the first of the newer lenses. They say: "The invention of lenses which, with large apertures, form images at once flat like the plates and sharply defined throughout, marks a new era in photography." This includes, I presume, all other anastigmats, whether German or English. What the firm referred to *does* claim is perfection, with the simplest possible construction, and this is undoubtedly the case, as it stands to reason that three *simple* glasses can be adjusted more easily—and perhaps more perfectly—than a doublet or triplet of a large number of components, cemented together. As to the test diagrams published in the pamphlet, it would be difficult, if not impossible, to excel the result of the "Cooke;" and, as a matter of fact, the "Cooke" with its full aperture of *f*·6·5 will cover, and cover sharply too, a larger plate than the one for which it is intended.

Again, Messrs. Taylor, Taylor, and Hobson have compared their "Cooke" lens with the Goerz (see *Amateur Photographer*, xxii. p. 340 *Photography Annual*, 1896, p. 174) and point out that the Goerz includes a rather wider angle than the "Cooke," but is *not so well corrected* within the angle for which the lens is constructed. Mr. Dennis Taylor, the inventor, described a new series of these lenses before the Camera Club, in which paper he said that, at an aperture of *f*-8, they covered an angle of 64° to 68°, more than that of the Goerz lens mentioned by Mr. Everitt.

In conclusion, I consider that Messrs. Taylor, Taylor, & Hobson are perfectly right in drawing attention to the defects of the rectilinear, which readers who are "unacquainted with photographic optics" (to quote Mr. Everitt's own phrase) probably do not know, or at least understand.—I am, yours, &c., P. JOURDAIN.

Ashbourne, Derbyshire.

THE MOSCOW EXHIBITION.

To the EDITORS.

GENTLEMEN,—May I ask you to mention in your columns, that if there are any of the exhibitors at the Moscow Exhibition whose exhibits were sent through me, and who have not yet received the commemorative "jeton," I should be glad if they would send me a post card to that effect? Thanking you in anticipation,—I am, yours, &c.,

12, *Hanover-square, London, June* 30, 1897. R. CHILD BAYLEY.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Mr. J. T. Barker, 71, High-street, Stourbridge.—*Photograph of Mrs. Cathcart.*

Thomas Ball, 7, Comberton-hill, Kidderminster.—*Photograph of Jubilee address to the Queen from the borough of Kidderminster.*

WALES.—Sorry we do not know of such a firm.

J. S. COOMBS.—Better sue the firm in the County Court.

BENJ. LITTLE.—Thanks; we have noted the circumstances.

HUGH TAYLOR.—We have forwarded your letter to the person named.

D. MITCHELL.—The photo vases are sold by Mr. Fallowfield, 146, Charing Cross-road, W.C.

E. W. A. S.—Difficult to say; but something between 10*s.* 6*d.* and 21*s.*, and the usual price for extra copies, strikes us as reasonable.

W. W. PARKINSON (Northampton).—We do not answer questions through the post. Send 1*s.* 7*d.* and three copies of the photograph to our publish[er], who will effect registration for you.

H. J. MILLER (Easton, Pa., U.S.A.).—The most suitable book for you w[ould] be Abney's *Photography with Emulsions*, published by Sampson L[ow] & Co., Fetter-lane, E.C. Price, we believe, 3*s.* 6*d.*

H. R.—The lenses you have tried appear to be round in the field, and to[o] deficient in covering power. The obvious course is to select a lens v[ery] a flat field that will cover the size of negative to be enlarged.

FABRIC FOR SCREENS.—W. H. SUTTON writes: "Will you kindly say [if] possible, in your next, where I can get fabric like enclosed to co[ver] screen?"—Similar material, if not the same pattern, may be obtai[ned] at any of the large drapers', such as Shoolbred's, Whiteley's, [or] others.

GROUPS.—W. BENNETT writes: "Will you kindly inform me if I can t[ake] satisfactory 12×10 groups in an 18-foot studio with a 12×10 wide-an[gle] rectilinear lens?"—No. The perspective will be too violent to [be] pleasing, although, if the lens be stopped down, the plate may [be] covered tolerably well.

FINISHING ENLARGEMENTS.—E. B. C. says she "would be glad to know wh[ere] powdered chalks of various tints suitable for finishing carbon or ot[her] enlargements can be obtained; also how the surface of carbon [is] prepared to take the chalk."—Paste's or chalks may be obtained fr[om] any artists' colourmen. No special kind are necessary. If the sur[face] of the carbon picture be rubbed over with an ink eraser, or a little [fine] pumice powder or cuttle-fish powder, it will suffice.

ALBUMEN PAPER.—E. J. WALKER says: "Will you favour me with rec[ipe] for keeping albumenised paper after it has been sensitised, as I find [it] won't keep twenty-four hours fit for use?"—Ordinary albumenised pa[per] will not keep more than about the time stated, after sensitising, this [in] weather, when sensitised in the usual manner. If, however, it be k[ept] between sheets of blotting-paper that have been moistened with a so[lu]tion of carbonate of soda and dried, it may be preserved for several d[ays] in good working condition.

PRINTS STICKING TO GLASS.—W. H. C. asks: "Can you assist me in [the] following difficulty? I have taken a few views in Ireland during [my] holidays, and, when I come to print them and then squeegee them [on] plate of glass, they stick to such an extent that I cannot get them [off] again. I have tried cleaning the glass with soda and water, also [by] rubbing with paraffin oil, also by heating the plate with hot water, [but] whatever I do they still stick. I have already spoiled over a dozen, [out] of eighteen."—Clean the glass thoroughly and then rub the surface well over with French chalk and dust off. The prints will not stick then.

GROUPS.—A. B. writes: "In photographing large groups of people, such as the laying of foundation stones, &c., could you give me the name of [the] best lens to use to get the best natural effect, 'as the eye sees the[m]' say, for use on a 10×8 or 12×10 plate? Wide angles give false [per]spective; a long-focus lens can't be used for want of room. I have [had] groups where the furthermost figures are quite distinct, in [large] gatherings too."—An ordinary lens of the rapid type will answer [the] purpose quite well, if used on the plate the size it is intended to cover. All lenses will require to be stopped down to obtain near and distant objects sharply defined.

"THE LATEST NOVELTY."—HAROLD says: "Amongst your Ex Cathedra notes in the JOURNAL for June 25, I notice the communication from [a] correspondent anent 'The Latest Novelty in the Photo Business.' Can you favour me with the address of the party sending out [the] circular referred to? also, have any more of your correspondents written you on the subject? If so, and it is not a breach of confidence, would you please say whether any of them have tried the plan and found it profitable, or do you consider it would be money thrown away to send the amount asked for in the circular?"—We have mislaid the address. We have no knowledge of the process; some correspondent may be able to supply the desired information.

CURLING PRINTS.—CHAS. BASTON says: "I have heard that there is a method by which one can prevent silver prints from curling, and understand that it is done by some manner of laying the prints face downwards on glass which has a solution on it."—There are several ways of preventing prints from curling, but we do not know of one like that our correspondent refers to. If the prints—we presume albumen prints [are] referred to—are dried under pressure, between blotting-paper, and then kept rolled up, face outward, for a time, they will have little tendency to curl afterwards; or, if, after they are dried, they are placed, face downward, on the table, and the edge of a metal rule laid across and pressed on, and the print drawn up with some force after, curling will be avoided.

STUDIO.—NORTH COUNTRY says: "I am about to build a studio, and shou[ld] very much like your opinion of the rough sketch enclosed. The studio proper is 26 feet long by 14 feet wide. Camera can be backed to make 29 feet; or, by drawing curtains, to make 36 feet. Height is 8 feet to the eaves, 12 feet at ridge; window, 2 feet from ground; length of glass, 20 feet. The aspect is north-west. Would even a shorter studio than this do, and less glass, as, although I can have plenty of land and no obstruction to the light, I want to lessen the cost of building as much as possible? How much of the glass used should be ground?"—We should say, keep to the design shown in the sketch. Less glass might be used if you only worked from one end, as per sketch; but, having the full 20 feet, you will have the opportunity of working from the other end as well, for single figures, which, at times, will prove a great convenience. The top glass may all be ground.

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EX CATHEDRÂ.

The meeting of the Photographic Convention of the United Kingdom, held at Great Yarmouth in the present week, is the twelfth of the series. Uniform good fortune has attended the institution during its career. From a comparatively small and experimental commencement, it has progressed along the path of success to the position of a well-established organization, supported by representative men drawn from all sections of photography. Its list of past Presidents includes the names of men who have been foremost and even eminent in photographic advance. It has ever been the aim of this Journal to recognise and exalt that side of a Convention meeting which is calculated to make some contribution towards the advancement of photography, and we have therefore thought that it might be acceptable to many of our younger readers, who are not intimately acquainted with Convention history, if we briefly summarised the principal features of former meetings, and thus endeavoured to make clear the fact that, independently of its many agreeable associations of a less grave and serious character, the work of the Convention has placed it in a position to deserve the support of those who judge it entirely from what it has done on behalf of the art and science of photography.

* * *

Derby was the scene of the first meeting in 1886, and, among a large number of papers that were read there, several stand out by reason of their excellence and practicability of theme. *Emulsion-making* was treated of by Mr. W. K. Burton and Mr. A. L. Henderson. Mr. Traill Taylor's subject was *The Telescopic Focussing of Distant Moving Objects*, and Mr. Andrew Pringle discoursed on *Daylight Enlarging*. *Fire Insurance* (F. A. Bridge), and *Instantaneous Work* (W. Cobb) were among the other more interesting matters touched upon. A glance through the papers will show the reader that they may profitably be studied even to-day.

* * *

In the following year the Glasgow meeting was characterised by an extremely good pictorial and apparatus exhibition. It was also noteworthy for the fact that two gentlemen first addressed the members on subjects to which they have since successfully devoted great attention, Mr. Bothamley dealing with *Orthochromatic Photography* and Mr. Pringle with *Elementary Photo-micrography*. *Pretended Photography in Natural Colours* was criticised by Mr. W. E. Debenham, the matter then as now attracting much public notice, while *Film Photography* and *The Silver Photo-salts*, which had just been described by the late Mr. Carey Lea, supplied Mr. Buchanan Wollaston and Mr. W. Lang with seasonable topics, on which they imparted a large amount of useful information.

* * *

Orthochromatic photography was prominent, in the hands of Mr. Bothamley and Mr. B. J. Edwards, at the Birmingham meeting of 1888, and we note that flashlight work, platinotype by the printing-out method, and photo-lithography were also discussed. The meeting may be remembered by many as having given the late eminent astronomer, the Rev. S. J. Perry, F.R.S., the opportunity of delivering a lucid and much-appreciated address on the applications of photography to astronomy. London was the scene of the Convention meeting in 1889, and once more Mr. Bothamley addressed the members on orthochromatism. *The False Rendering of Photographic Images by the misapplication of Lenses*, by Mr. Dallmeyer, and *the Photo-mechanical Printing Methods as employed in the Jubilee Year of Photography*, by Mr. Bolas, were among the

papers contributed. The meeting received the report of the Committee upon Lens Standards, which was appointed the previous year, at Birmingham, to consider and report upon the best means of securing uniformity in diaphragms and flanges of photographic lenses and lens mounts, in which several useful recommendations were made.

* * *

In the able hands of Mr. Haddon, Lens Standards was again made a feature of the Chester meeting of 1890, at which Mr. Gambier Bolton gave an attractive paper on *Animal Photography*. At the same meeting Mr. Friese-Greene read a paper, in the course of which he described a camera which had been constructed for taking animated photographs by merely turning a handle, which made a series of negatives on a band of sensitive material at the rate of 600 a minute. He also exhibited some results. There was further presented the report of a Committee appointed to consider the weights, measures, and formulæ used in photography. Recent developments in printing processes were described in detail at the Bath meeting of 1891 by Mr. Bothamley, the "cult of indistinctness" being condemned by Mr. Debenham, and Mr. Warnerke read a paper on a series of proposed International Standards. At the Edinburgh meeting, in 1892, the "art" aspects of photography received considerable attention, and the more practical side was not so largely dwelt upon as hitherto.

* * *

Plymouth, which was the next town visited, produced a large number of notable papers, among which we may cite a very exhaustive dissertation, on the special properties of the Zeiss anastigmatic lenses by Dr. Rudolph, and an exposition of Messrs. Hurter & Driffield's photometrical work in the determination of plate speeds. The names of Burton, Wall, Bothamley, and Lambert also appear among those who made contributions of papers to the meeting, development receiving considerable notice. At the Dublin meeting in 1894 Dr. Joly outlined his colour process, and the same gentleman treated of the influences of temperature upon the sensitiveness of dry plates, and also described his photographic sextant; astronomical photography and the uses of photography in medicine likewise figured in the programme.

* * *

Still keeping itself abreast of the times as regards the subjects of most current interest to photographers, the Convention at Shrewsbury in 1895 had before it the ever-fascinating subject of photography in colours by the three-colour method, by Mr. E. J. Wall, Mr. Child Bayley dealing with Lippmann's interference system. Mr. Maskell found a congenial topic in pictorial photography, the old and the new. At Leeds, last year, Mr. Haddon's valuable paper on the fixing and washing of paper prints, radiography, and orthochromatic photography, with Mr. Robinson's useful presidential address constituted an attractive list of subjects. It is worth while mentioning, too, that since last year the Convention has instituted a fund for the aid of photographic research. This year's doings of the Convention are before our readers, and need no special mention here.

* * *

This necessarily brief and imperfect outline of the practical work upon which the Convention has engaged during its existence will, we trust, remove any doubt, if such existed, that it fills a large and useful part in the promotion of photographic progress. We do not hesitate to suggest that there are few photographic institutions which by their deeds have so thoroughly well earned the loyal support of photographers as the Convention. Its useful and honourable past, foreshadows, we are convinced, an even more successful future, from which photography all the world over will not improbably derive some substantial gain. In wishing the Convention continued success in its practical work, let us not be understood as minimising the value and advantages of the purely social features of the meetings. These unquestionably react to the promotion of good feeling and a better understanding among those engaged in the advancement of the art and science we all love so much, and in those respects they extort approval and commendation.

BACKED PLATES.

One of the most surprising facts in connexion with the practice of photography is the dense conservatism characterising the modes of working of a large number of both professionals and amateurs. Take the now ubiquitous dry plate itself. How many years were they not advertised, and of good quality too, before any but a small band of workers made any use of them? It is true they were advertised at so much per square inch, and their price at that time was far beyond the present exceedingly low rate, hence economy might be said to stand in the way. But such an excuse would be based on false premises, for the simple reason that a large proportion of the best wet-plate men always used patent plate, the price for each piece of this glass being more than double the sum now paid for glass and film combined. Let us take, again, the use of sulphite of soda with the developer. It is difficult for later-day workers to understand how photography was carried on without sulphite, yet such was the case, and it was some years after Berkeley introduced it into photographic practice before its true value was appreciated or its merits known. Finally, let us examine the history of backed plates, because it is far more than a quarter of a century since it was discovered that by "backing" the plates of that day with a suitable substance the effect termed halation was either entirely eliminated or reduced to a minimum.

In consequence of this discovery, some of the dry plates then made were sold ready-backed. There was, however, never a large sale, and some time before the advent of gelatino bromide, the Hill-Norris plates held the field. Then came the era of gelatino-bromide, and the backing of plates fell into desuetude. After a while, the need for a remedy for halation became talked about, and the old idea of backing came to the fore. A few wise ones put it into practice; but to this day an immense majority of workers never employ it, partly, no doubt, through ignorance, partly through supineness, partly through the dogged conservatism we speak of.

For many years past we have, in season and out of season, referred to the subject and insisted upon its necessity. We should like to point out that we have shown, and would still continue to show, that there is great usefulness in plate-backing in a far larger number of cases than those gross ones instanced so often when taking views with dark objects cutting against the sky, or interiors with brightly illuminated windows. The effect of the reflection at the back of the glass is there plainly visible in "halation" effects; but, in taking a portrait, for

instance, a similar effect of reflection must be operative and degrade the half-tones, though it might be difficult to place the finger on the spot, as with halation proper.

It is not to be supposed that backing has been in all cases, and with every one, a mere occasional fancy, for we know, at any rate, of one instance where a well-known professional has had a dark room fitted up specially for the purpose of plate-backing, he, no doubt, finding that to do it under ordinary dark-room conditions was running too much risk, either of accidental spoiling of the plates by thoughtlessly admitting actinic light, or by the light found sufficiently safe for the few minutes needed to develop being actinic enough to fog plates exposed a sufficient time for the backing to become dry. Such work, however, becomes a heavy tax upon the time of the experienced hand, and it is a subject of some congratulation to us that our labours appear at least to be fructifying in a direction to save this waste of time. For some years past one firm of plate-makers, who make a plate of great excellence, but not perhaps in such large quantities as some of the great establishments, has always listed plates ready-backed, and now their example is being copied by others, or our teaching is bearing fruit, it matters not which. We think it probable that the time is not far distant when all plate-makers will stock ready-backed plates. Some years ago we described a simple mixture for backing, which any one could make, and the materials for which were always at hand; nothing could excel it for the purpose; but, so long as the backing is efficient, we have no feeling in the matter as to what form it takes. But there is one very important point to be considered in the choice of a backing, on which we desire to lay some stress — the facility with which it can be removed. For simplicity, ease, and cleanliness, none can surpass that of the firm we referred to; it is simply black paper suitably attached, and it peels off shortly after the plate is placed in the developer, and before the development is complete. Next we come to a pigment applied in conjunction with a suspensory medium of refractive index near to that of glass, this being the method recommended by us in these columns. When an unsuitable medium is employed, it may be too difficult of removal, or too tacky, through excess of glycerine, to admit of convenient handling. These points should be well considered.

Finally, we come to the plan recommended many years ago by Captain Abney—the use of a collodion coloured by aurine and magenta or other suitable dye. This plan is very effective, but it has a great drawback. It is adopted by one large firm who list certain of their plates ready-backed (in this manner) at no increase of price. A correspondent, writing on the subject, complains to us of the immense amount of labour needed in getting rid of the backing. He tells us that on Jubilee Day he took a number of large plates so backed, which he desired to print from at once; but, when he came to removing the coating, he found it absorbed such an immense amount of time that he could not get his prints through, and the annoyance it created was so great that he found the English language insufficient to express his feelings. He tried scraping it with a knife, and so filled the air with fine particles of dye that he ruined a number of prints that were exposed to dry by irretrievably dyeing them. He tried methylated spirit and ether, and dyed his hands all over. He used a knife to it while wet, and found half an hour a plate not enough time to give to the work.

In conclusion, we can only say that, though backing, even the best, is no certain cure at all times for halation, it is so great a palliative that, no one should attempt outdoor or interior work without backing his plates by one or other of the plans we have described.

The Metric System.—It may not be generally known that the use of the metric system of weights and measures under all circumstances is actually illegal in this country; but a Bill to render such use legal passed its first reading in the House of Commons a month ago.

Improving the Working of Collotype Plates.—Herr August Albert points out that collotype plates may be much improved as regards their life, especially as regards the stripping of the gelatine in the unexposed parts by merely heating the plates from the glass side to about fifty degrees Réaumur, and then cooling them. This causes a perfect drying of the film right through to the glass, and the film will then give much longer runs. More chrome alum added to the bichromated gelatine is also useful.

A Huge Photograph of the Moon.—Dr. Weinek has projected an idea quite in consonance with the present era, one which may be considered as being the age of big things. Among them is Dr. Weinek's projected map, a prospectus regarding which he has recently issued, together with a specimen plate. The scale is such that, if the whole moon were included in a single sheet, it would be either ten or thirteen feet in diameter, the former for Lick negatives, the latter for those taken at Paris. The price is to be 10*l.*

Sciography of Organic Bodies.—The *Journal of Malacology* is the source from which *Science Gossip* obtains some interesting examples of radiography. It appears that, in a paper read before the Natural History Society of Buda-Pesth, Dr. J. Istoanffy points out that the Röntgen rays do not entirely pass through all the parts of living plants, the woody tissue only being permeable to them. When a leaf of a camellia was placed in their path, the veins appeared white. Indeed, all other beyond the woody tissues, whether they contain chlorophyl or not, are opaque to the rays.

Photography for Measuring Refractive Indexes.—MM. Augnate and Louis Lumière read a paper before a recent meeting of the Paris Academy of Science upon the usefulness of photography in measuring indices of refraction. The plate, the index of refraction of which is to be measured, is coated very thinly with a sensitive emulsion. It is then faintly illuminated by rays from a point (a minute hole in a sheet of metal). Under these circumstances a halo is produced, arising from the reflection at the back of the plate, the edges of which are quite sharp, and whose diameter determines the refractive index. To apply this measure to the refractive indices of liquids, the back of the plate is wetted with the liquid, and packed with a piece of velvet soaked in the same.

The Polar Balloon.—A despatch from Danes' Land has been received at Stockholm to the effect that M. Andrée has filled his balloon with gas, and that it is found to be in a satisfactory condition. It will be remembered that last year, when the expedition was abandoned, it was thought by some that the storage of the balloon for so long without attention would prove detrimental to the fabric. Such, however, does not seem to have been the case, for, according to the report, the balloon had then been filled for nearly a week. Everything had been got ready for the ascent on the first of July, if the wind was from the desired quarter. Considerable interest is attached to this exploit, on account of its novelty and the hazardousness of the undertaking. The result is, of course, looked forward to with much interest in the scientific world, and with some anxiety by the aeronaut's friends.

A New Use for Photography.—The Deputy-Master of the Mint, Professor Roberts-Austen, in a memorandum to his recently issued report, refers to a new mode of utilising micro-photographs. An engraver who may have devoted months of work to the preparation of a die is always more or less uncertain whether the subsequent and inevitable operation of hardening will be successful or not. It is satisfactory, therefore, to find that more information as to the suitability of steel for the manufacture of dies can be obtained by a micro-photograph of a prepared section of the metal than by subjecting it to the laborious process of chemical analysis. What is wanted is some assurance that a piece of metal will harden safely when the engraver has done his work, and this is supplied by photography.

Automatic Astronomical Photography.—The proposal to work a number of photo-astronomical instruments from a central point, the whole controlled by a single observer, has been brought forward before now, but weather conditions on eclipse occasions have always stood in the way. Such a one was devised for the Amherst Photographic Expedition last year, and by its aid twenty photographic instruments would have been worked under the supervision of one man, and four hundred exposures would have been given. Mr. Jodd's system involves electrical control, and he states it to be capable of operating any number of instruments adapted for photographic use. Beyond this also, it keeps a record of every exposure. Detailed information as to the plan will be found in the *Astro-physical Journal.*

Mallmann's Improved Gum-bichromate Process.—Dr. H. Mallmann suggests an improvement in the bichromated gum process, which is the addition of starch to the vehicle. Forty parts of gum arabic should be dissolved in a two per cent. solution of starch and a few drops of carbolic acid be added and the whole pressed through a cloth. The sensitive mixture is equal parts of the above solution and saturated solution of bichromate, the pigment being added as thought fit. No special paper or sizing of the paper is required. To obtain brilliant prints the paper must be dried quickly. The best results with this paper are obtained with soft, but not too thin, negatives. In order to obtain harmonious prints from hard negatives, Dr. Mallmann smears the paper with petroleum, and then prints with the paper in contact with the negative, the petroleum being driven off afterwards with heat.

Patents.—When the regulations with regard to the use of acetylene and the storage of calcium carbide and the restrictions of the insurance companies were published some time ago, it was predicted by some that acetylene would be killed. This prediction, however, does not appear likely to be fulfilled if one may form an opinion by the number of patents that are being applied for in connexion with it. For some time past the number of patents applied for connected with acetylene have averaged six or more a week. Similarly, after the serious accidents with the cinematograph, it was surmised by some that animated photographs would be killed also. This is far from being the case, if we may judge from the number of patents being applied for in connexion with them, as will be seen by our weekly lists of applications. Evidently inventors still have confidence in the commercial value of acetylene as well as animated photography.

Kites and Meteorology.—We have already given our readers an account of experiments made for the utilisation of kites for purposes for which photographic aid would be invaluable; and now it appears that, at last, a new method, founded upon the use of kites, has been devised, and by its means we shall be put in possession of the means to take a forecast sixteen hours earlier, and with greater rapidity, than hitherto. The United States Weather Bureau has been carrying on these experiments, and this claim is made by them. It is stated that they have established it as a fact that the shifting often occurs at a height of a mile above the earth's surface, for twelve to sixteen hours before the same change of direction occurs on the surface. Researches by means of high-flown kites and aeroplanes have now been prosecuted so far as to warrant the expectation that, within six months, the United States Weather Bureau will be able to construct a telegraphic synchronous chart, based on conditions of atmosphere one mile above the earth. This chart will cover the region between the Rockies and the Alleghanies at the outset.

An Over-crowded Lens.—A friend, the other day, overheard a most amusing conversation in a railway carriage. As others may enjoy it as well as he did, we give it here. At one of the suburban stations a gentleman and two ladies entered the compartment, one of the latter carrying a camera of the guinea, fixed-focus type, which the gentleman was evidently instructing her in the use of. The lady, pointing the camera at her friend on the opposite seat, appealed to the gentleman as to the exposure. He, after looking at the image on the finder, said, "Instantaneous," and click went the shutter within a couple of feet from the subject. Then ensued the following conversation: "What a pity, Mr. ——, that the negatives you took on your holiday turned out bad. Were they all bad?" "Yes; every one of them." "How do you account for that?" Here the gentleman hesitated, evidently not liking to show ignorance; but the query, in effect, was repeated. Then came the reply, "Well—er—er—I think I must have over-crowded the lens; one is apt to do that sometimes, don't you know." "What a pity," said the lady, "because they would have been so good," &c.

The Royal Photographic Society's Historical Victorian Exhibition.—We have been asked many times about the Royal Photographic Society's Historical Exhibition now on view at Earl's Court. We have not yet had the opportunity of seeing the show ourselves, but some of our friends have, and they say that scant justice has been done to the Royal Photographic Society by Messrs. Kiralfy, Spiers & Pond, and the other promoters, inasmuch as the Photographic Section does not even figure in the catalogue at all. The Photographic Section, we are told, consists only of the Royal Photographic Society's small museum, and in no way illustrates the progress of photography during the Queen's reign. Does this redound to the credit of the Society, as it undertook the organization of this section and was supposed to make it truly representative? Further, does it conduce to the credit of any photographic society to lend its prestige to any purely commercial undertaking, however well it might carry it out? We have it on fairly good authority that the Photographic Club was invited to contribute, from its museum, to a Victorian Exhibition, but the Committee declined to do so on the ground that they could not lend the Club's property to any purely commercial enterprise, and rightly too.

Photo-polygraphy.—Under this title Sobacchi describes a method of printing which is very much like collotype on a flexible basis. A five to eight per cent. solution of gelatine in water should be made and poured into a flat porcelain dish, and white, strong, and, as far as possible, grainless, paper should be drawn through it, and the sheet allowed to set and dry, and then drawn through the solution again, and again dried. The prepared sheet should be bathed in a three or five per cent. solution of potassium bichromate, and then squeegeed down to a sheet of plate glass to extract excess of solution, and then stripped from the glass and hung up to dry in the dark. It should now be printed *under a positive* for half a minute in the sun, or about four minutes in the shade. The image should appear bright yellow on a brownish ground. It must be thoroughly freed from all bichromate, and then freed from excess of water with blotting-paper. The image will appear in relief, and the whole surface should be brushed over with a fairly concentrated solution of methyl violet or some other colour to which a few drops of glycerine and some sugar or glucose has been added. The excess of dye is removed with blotting-paper, and then a sheet of white paper is laid on the image and squeegeed gently down, when an image will be obtained. Sobacchi states that the *cliché* thus obtained may be used for years.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Great Yarmouth Meeting, Monday, July 12.

ROBABLY at no previous meeting of the Convention was the turday arrival list so large as that of this week's gathering at Great rmouth. By night a considerable number, doubtless taking adntage of the fact that Yarmouth offers all the attractions of a seale resort, had reached the scene and were in evidence the following y, when the Local Hon. Secretary, Mr. Harvey George, and Mrs. arvey George held an afternoon reception at their residence, The wer, Gorleston-on-Sea. This pleasant method of informally ingurating the week's doings was highly appreciated by the sixty ests, who found much to interest and attract them in the agreely situated house and grounds which overlook the river and the a, and afford a panoramic view of great beauty and variety.

Early in the morning of Monday many members were in attendance the Town Hall, where the meetings are held, making their arrangeents for the week with the Hon. Secretaries. We may here state at the following is the Local Executive Committee: Colonel H. E. uxton, Mayor of Great Yarmouth; Canon Rogers, Vicar of Great armouth; Rev. Edward Rainbow, M.A., President, Great Yarouth Camera Club: Surgeon-Major J. Adcock, M.D.; Rev. Dundas farford Battersby, M.A.; Dr. John Bately; Mr. Frank Burton; nd Mr. W. G. Lewis; Hon. Local Secretary and Treasurer, Mr. H. Harvey George.

The brunt of the local work has fallen upon the last-named gentlean, who has got through it with characteristic energy, and whatver success attends the week's doings will be greatly due to his nsparing efforts on behalf of the Convention.

Thus early in the week one encounters at every turn many of the ld, familiar faces of the Convention, and we note with satisfaction hat the badge is being worn by many who have not hitherto been resent at a meeting. The Convention, as we have remarked elsewhere, has all the attributes of a firmly established institution. It s welcomed wherever it goes, and always leaves a good impression ehind it. We are sorry that Mr. R. P. Drage this year finds it ecessary to vacate the office of Honorary Secretary; but, mingled vith the regret which his resignation necessarily gives rise to is the leasant feeling that he leaves the Convention in a thoroughly rosperous condition, and that he deserves the thanks of every nember for the hard work he has done during the last few years.

Yarmouth, with its crowded sea front, the river, the quays, the shiping, the famous old "rows," the Tol-house, St. Nicholas Church, and nany other interesting features, supplies photographers with plenty of pportunities for making exposures, and the consequence is that a onsiderable amount of work has been attempted during the past ew days. The hand camera appears to be in greater prominence han ever, and we note many old and experienced photographers, whose names are household words, armed with some form of portble camera, evidently content to thus minimise their photographic labours during the week.

The Town Hall, in which the meetings are being held, has recently been handsomely redecorated throughout, and the Convention is fortunate in having secured so eminently suitable a place. The arge room accommodates several hundreds, and for the purposes of a reception, an exhibition, showing lantern slides, and holding meetings, could not be improved upon.

The Trade Exhibition.

At the time of writing, all the exhibits for this section of the Exhibition had not arrived, but considerable interest attached to the contents of at least one stall, which, under the charge of Mr. George Davenport, the well-known lantern expert, was devoted to showing several examples of the Dansac-Chassagne results in colour photography. These consist of prints and trasparencies. The mysterious "solutions" are also at hand, and demonstrations are to be given of the method of colouring the prints. It is worthy of note that it is at a Convention meeting that the first public demonstration of the process has been given. One result that was shown to us, which was a reproduction of a fabric printed in colours, is perhaps the most successful example of the process that we have seen.

Messrs. Percy Lund & Co., of Bradford, have a large stall, on which their many publications are displayed. Our attention was specially drawn to an album of photographic views of Matlock in three colours, which is, we believe, the first book of the kind issued.

Mr. Charles L. Burdick, of the Aerograph Company, had an attractive exhibit of large examples of work produced by the Aerograph, the uses of which he has demonstrated throughout the week. Some of the pictures are in colours, and the whole exhibit is both good and interesting. At the moment of writing we are the recipients of an invitation to sit for our own portrait, from ten to twenty minutes being required to enable Mr. Burdick to depict a sitter by means of the Aerograph.

Messrs. R. & J. Beck, of Cornhill, exhibit the Frena and many other of their specialities. Special prominence is given to an enlargement of a view of the Queen's Procession in St. Paul's Churchyard on Jubilee Day. The original negative was, we believe, taken half-plate size, and the enlargement is certainly one of the best Jubilee views that we have seen.

The Thornton-Pickard Company devote their stall to a useful display of their specialities in shutters, stands, and cameras. A prominent object of their exhibition is what at first sight appears to be an enormous model of a Thornton-Pickard shutter. Upon closer inspection it turns out to be a changing tent which is to be placed at the disposal of Convention members throughout the week.

Mr. R. W. Howes, of East Dereham, is well represented by several specimens of enlarging work. These are well executed, and amply attest Mr. Howes' ability in producing artistic work of this character. The colours and finishing of the photographs are particularly pleasing.

Mr. Sanderson, of Cambridge, has given Convention visitors the opportunity of practically testing his universal swing-front camera, to which we favourably referred a few weeks ago. There should be ample opportunity for utilising this camera in the very narrow "rows" of the town. On behalf of Messrs. G. Houghton & Son, Mr. Sanderson also exhibits Maloni's flashlight apparatus, which will, doubtless, be put in use during the week.

Further references to the exhibits will probably appear in our next.

The Pictorial Exhibition.

In a smaller hall of the Town Hall the President, Mr. Cembrano, following the useful example set by his predecessor, Mr. Robinson, has placed on view a collection of pictorial photographs that he has organized. It includes works that have recently been shown at the Exhibitions of the Royal Photographic Society and the Photographic Salon. Among the contributors are Mr. Cembrano himself, Messrs. Bulbeck (architectural views), Horsley Hinton, James A. Sinclair, H. P. Robinson, E. R. Ashton, John H. Gear, H. Selby, H. W. Bennett, W. Thomas, J. Carpenter, R. W. Robinson, &c. There are no examples of portrait work, but the Exhibition as a whole, although possibly inferior to the collection organized last year by Mr. Robinson, is, nevertheless, distinctly good and interesting, and is sure of considerable local appreciation, as affording a fair idea of the stage to which pictorial work in photography has advanced.

With the East Anglian Exhibition we are somewhat disappointed. Of the highest class of work there are only two contributors, namely, Dr. P. H. Emerson, who sends eleven characteristic examples of his powers, with most of which our readers are familiar. They include *The Poacher*, *Pale Winter*, and *A Norfolk Wherry*. Mr. Horsley Hinton, most of whose admired landscape work has been done in East Anglia, sends about a dozen contributions to the section. Mr. Harvey George sends an excellent picture of a Norfolk wherry, and other works; and among the other contributors are Dr. Adcock; Mr. Clarke, of Bury St. Edmunds (architectural work); G. and M. Rumbold, who have many views on the Broads, &c.; A. Price (architecture); T. J. Wigg, with a variety of snap-shot studies in an ill-chosen variety of positively unsuitable tones; J. S. Cobb (prints from local photographs taken forty-two years ago), &c. But altogether, considering the fine scope

which was offered, the East Anglian section is less successful than it might easily have been made. Dr. Emerson's and Mr. Hinton's work are the chief attractions; and most of the remaining exhibits are of the kind known as the "usual thing," although, to be quite fair, the exhibitors we have named have sent in good photographs, *sui generis*.

The Reception.

In the evening the members of the Convention were received by the Mayor of Yarmouth, Colonel H. E. Buxton, and Mrs. Buxton, at the Town Hall. There was a very large attendance, although the number of local visitors was comparatively small. Among those present we noticed his Worship the Mayor (Colonel H. E. Buxton) and Mrs. Buxton; Mr. W. W. Naunton; Mr. H. Sturmey: Mr. J. B. B. Wellington and Mrs. Wellington; Miss Langdon; Mr. and Mrs. Seaman; Major Lysaght; Mr. E. J. Wall; Mr. and Mrs. Snowden Ward; Mr. Thomas Bedding; Mr. P. R. Salmon; Mr. W. D. Welford; Mr. A. L. Henderson; Mr. and Mrs. Percy Lund; Mr. T. R. Dallmeyer; Mr. A. Haddon; Mr. J. L. Lyell; Dr. P. H. Emerson; Mr. J. T. Sandell; Mr. H. J. Elliott; Mr. Charles Winter; Mr. Harold Baker; Mr. C. S. Baynton; Mr. Godfrey Bingley; Dr. Adcock; Mr. E. G. Richardson and Mrs. Richardson; Mr. A. Tate; Mrs. Stevenson; Mrs. Huist; Mr. T. Fall; Rev. Mr. Fall; Mr. G. Davenport; Mr. W. G. Watson; Mr. F. E. Ives; Mr. S. B. Webber; Mr. F. York; Mr. H. P. Robinson and Mrs. Robinson; Mr. F. de P. Cembrano and Mrs. Cembrano; Mr. George Mason, Glasgow; Mr. John Stuart, Glasgow; Mr. J. Porrit, Leicester; Mr. C. P. Lucas; Mr. G. W. Tottem; Mr. F. W. Hindley; Mr. W. Crooke, Edinburgh; Mr. R. P. Drage and Miss Drage; Mr. Washington Teasdale; Mr. F. A. Bridge; Mr. A. Bridgman; Mr. C. H. Bothamley; Mr. E. R. Ashton, Tunbridge Wells; Mr. W. H. Prestwich; Mr. T. Morley Brook; Mr. J. J. Briginshaw; Mr. Andrew Pringle; Mr. A. Horsley Hinton, and many others.

On the invitation of the Rev. Mr. Rainbow, the Mayor gave the members of the Convention a hearty welcome to Great Yarmouth, and hoped that the visit would be full of interest and pleasure.

Mr. H. P. Robinson (the retiring President) said it was his duty and pleasure to introduce the President-elect, Mr. F. P. Cembrano, who was eminently adapted to fill the position and adorn it. He had many qualifications for the position, not the least of which was his gift of organization, as exemplified in the past history of the Convention. In pictorial photography, too, he had won a place that was taken by few.

Having been decorated with the badge of his office, Mr. Cembrano delivered his presidential address.

PRESIDENT'S ADDRESS.

In reviewing the progress that has taken place in photography since our last meeting at Leeds a year ago, although there is nothing of a startling nature to bring before you, yet it is very satisfactory to note a steady and continuous advance in all its various branches.

I must, however, make a slight exception, and that is in printing processes, for, although we have a great choice in the very excellent papers now in use, yet it must be admitted that there is plenty of room for further improvement. A paper is much needed possessing the ease and simplicity of manipulation, permanency of results, and beauty in quality of platinotype, combined with the certainty in printing of what are commonly called "printing-out papers."

There is no great difficulty, some will say, in getting good prints by the ordinary platinotype process; but, when it becomes a question of obtaining a number of them of good and even quality, or when combination printing is needed, then the desirability of watching the progress of the image becomes apparent, and first-class results are only attainable at the expense of a considerable waste of time and material.

The two branches that have been most prominently before the public within the last twelve months are, undoubtedly, photography in natural colours (rather a misnomer) and instantaneous photography as applied for the illustration of movement. I do not attempt to give it a name, but it is best known as the kinematograph or the cinematograph.

In the realisation of the ideal of obtaining photographs with the colours as seen in nature we seem to be as far off as ever. Marvellous results have indeed been produced, but none of them fulfil ou aspirations. Becquerel, long ago, was able to reproduce seven colours, but the impossibility of fixing his results was his stumblin block. Since those days, claimants from all countries have com forward at various intervals asserting they had discovered the tru rendering of colour; but, I ask you, is photography in colour a accomplished fact? Look at the beautiful results shown b Bennetto, Chassagne, Ives, Joly, Lippmann, and Lumière, and te me, is that the last word on the subject? No, we must go o plodding away in our endeavour to discover that permanent *facsimi* of the image as seen on our focussing screen.

Animated photographs have been the rage everywhere, an following on the early start made by the Messrs. Lumière, a host o inventors have lost no time in bringing forth the results of thei labours, with the most wonderful names attached to them. Th series of pictures obtained are certainly most interesting, and th appreciation with which their exhibition is received by the publi testifies that, as a recorder of events, this new branch of photo graphy is invaluable; indeed, there is seldom a public functio nowadays in which this apparatus is not present.

In lenses it is very gratifying to mention that the supremacy o the British article, which at one time was seriously threatened, i still a fact. Dallmeyer's new stigmatic lens working at *f*-6, an including a fairly wide angle, is a decided advance, combining, as i does, the two great desiderata of greater rapidity and better coverin power, besides being practically free from astigmatism. I make n special mention with regard to the concentric lens of Ross, Cooke' new lens, and others, as they were already known before the las Convention.

The striving after greater rapidity in the manufacture of plate still continues, the most noteworthy feature being that, combine with increased sensitiveness, manufacturers endeavour to secure a finer deposit in the film. Although at first sight an insignificant advance, yet of immense practical value, is the latest move in the production of plates ready backed, and at the same price as ordinary ones. It is earnestly to be hoped that, within a short time, every plate used will be so prepared as to be proof against the evil of halation.

With regard to illuminants, the latest comer, acetylene, is gradually becoming better known, and will soon, no doubt, be more generally used. The danger in this new gas arises from employing it in an impure condition, and from its admixture, in certain proportions, with air, more especially so when compressed in cylinders; but, if the pure acetylene is used in a suitable generator, it is no more to be feared than any of the other illuminating gases. The greater actinic value of this light renders it especially suitable for photographic purposes.

Coming now to the other side of photography—that is, its pictorial aspect—I am bound to confess that I prefer to say as little as possible on the subject; it is such a debatable question that I dare not touch it. Suffice if I mention that there has been, and continues to be, a general advance in the efforts to produce something more than a topographical representation of the subject. Indeed, although I cannot go so far as to claim for photography a position among the fine arts, yet most will agree with me that the most charming pictorial results are often obtained by our best workers. Our limitations being so much greater than in the other graphic arts, it redounds, greatly to the credit of the photographer when he idealises his subject in such a manner as to render it pictorial. We have not colour at our command, it is seldom that we can add a desirable feature, and more seldom still that we are able to omit an objectionable one in our picture, hence that difficulty of being original in our work; but, for all that, we should most certainly endeavour to show individuality in our productions. By all means let us study, and study carefully, the many beautiful photographs shown at our exhibitions, but never with the intention of imitating the particular style or mannerism that strikes us most forcibly.

There is room for all earnest workers in photography, but let us seek for that room on the top of the tree where others have not been.

Mr. C. H. Bothamley proposed a vote of thanks to the President for his address, which was carried. Mr. J. Stuart (Glasgow) proposed a vote of thanks to the retiring President (Mr. H. P. Robinson), of whom he said that he hoped he would long continue to be the guiding spirit of pictorial photography and be present at many more Conventions. After a vote of thanks had been passed to the Mayor, the formal proceedings terminated.

Mr. Ives, who was present, delighted the visitors with an exhibition of his photo-chromoscopic transparencies in colours. Much

nterest centered in the "demonstration," by a French lady, of the Jansac-Chassagne process of colour photography. We reserve detailed references to the "demonstration," but in the meanwhile we may observe that, from what we saw, the process appeared to be a skilful inversion of the time-honoured crystoleum system of producing coloured photographs, the colour being applied to the front instead of the back. All the same, some most excellent results were produced, the flesh tints of a portrait subject being remarkably well rendered, no "over-lapping" of colour being noticeable.

TUESDAY, JULY 13.

Glorious weather prevailed this day, and a very large party undertook the excursion to Norwich, the journey being made by river.

The party numbered considerably over a hundred, and, the light being excellent for the purpose, a considerable amount of photography was done, the Cathedral being the chief centre of interest. A smaller party journeyed to Lowestoft.

At the evening meeting Mr. Horsley Hinton read his paper on *Methods of Control, and their Influence on the Ultimate Development of Artistic Photography.*

WEDNESDAY, JULY 14.

The Annual General Meeting of Members was held in the morning at the Town Hall, among the business being the election of Council for the ensuing twelve months.

The Convention Meeting of 1898 will take place at Glasgow.

At the conclusion of the formal business the usual group of members was taken; and in the evening the Annual Dinner and Smoking Concert were held.

Thursday's excursions were to Salhouse Broad and Aylsham, and in the evening the papers to be read were, *The Points of a Lens*, by Mr. Dallmeyer; and *The Strength of Hypo Solution and time of Immersion for Fixing Albumenised Paper*, by Messrs. Haddon and Grundy (Convention Grant paper). To-day (Friday) the principal excursion is to Oulton Broad, under the leadership of Dr. Emerson. *Half-tone*, by Mr. Gamble, and *Photography in Natural Colours*, by Mr. Wall, are the subjects of the evening papers. The Convention week winds up to-morrow (Saturday) with a visit to Ipswich.

BY THE WAY.

IT appears I was somewhat out in my estimate of the quantity of collodion or emulsion required to cover a 24×18 plate, and I must say that, like Mr. W. T. Wilkinson himself, I am greatly astonished at the result of his trial, though, as I distinctly stated, the quantity actually required to form the film does not at all represent the quantity *used*, and by that term I mean the quantity rendered, temporarily at any rate, of no further use. If Mr. Wilkinson succeeded in coating a plate 24×20 with two and a half ounces of collodion, he did in the first place what only a very expert operator would do; but what would be the after-value of the two ounces poured back from the glass, or of the remains of the original ten ounces, if the surplus were returned to and mixed with that?

The two ounces, if kept separate, would be absolutely useless for coating even small plates, while, if returned to the bulk, it would be impossible to go on long coating plates of that size, even from a much larger quantity than ten ounces. Of course, I do not mean to say that in a large establishment, where plates of mammoth dimensions are in constant use, there must necessarily be a loss of a large percentage of the collodion from every coating; under such circumstances, I assume that measures would be taken, as far as possible, to keep the collodion in an average condition when poured on to the plate, by starting with a fair quantity, and making up the bulk with fresh after each plate was coated. This plan might even answer fairly well for an amateur coating only two or three, or, at most, half a dozen plates at once, if it were collodion, and not emulsion, that was in use; but even then, unless there was a large bulk of liquid to fall back upon, there must be considerable irregularity in the results obtained, and that is just where the amateur stands at a disadvantage, and where the cost of his operations would be far greater than the mere paper calculation would show. At any rate, I don't think Mr. Wilkinson would care, even at the present low price of silver and using methylated solvents, to try and make a commercial success of 24×18 collodion plates, at two shillings a piece, exclusive of glass.

Mr. Osmond R. Green's letter, a fortnight ago, tends to support my contention, though I see I was mistaken in supposing that he employed wet plates, or, rather, *bath* plates, for I was fully aware his films were dry. The employment of emulsion somewhat complicates the matter, because, although with small plates it would be undoubtedly cheaper than collodion and the bath, with surfaces of the dimensions under discussion, it would, I think, prove more expensive, unless the "waste" were most carefully saved and dealt with. What I mean is this, I have spoken of averaging the condition of the collodion as poured on to the plate, and *with* collodion this may be, to a certain extent, possible; but, from my own experience, I should say that it is impossible, with collodion emulsion, on account of the different physical conditions, with plates larger than 12×10, and Mr. Green's details would seem to bear me out.

Those who have worked at all with collodion emulsion will be only too well aware that one of the chief difficulties consists in getting even films, free from mottling and wavy marks, and this difficulty increases with the size of the plate. In order to avoid it, other things being in right condition, there are two points which must be observed, namely, to have the emulsion as free as possible from water, and, almost equally important, to have the solvents properly balanced. It will be remarked that Mr. Green alludes to the necessity of using "absolute" alcohol and ether; but, whatever the commercial samples may be called, they are sure to contain some water. However, let us suppose that they are really no worse than sp. gr. ·805 and ·725 respectively, and that, when they are used in equal proportions, the emulsion is just in condition to coat a 24×18 plate without mottling.

Now, supposing a pint (twenty ounces) to be placed in a measure glass for greater convenience of use, how many plates of that size does any one suppose can be coated without showing mottling, assuming the bulk to be reduced by, say, four ounces at each coating, though I think a trial would prove the quantity to be much greater in this case? I do not imagine even the second plate would be perfect, for not only will the residue of emulsion contain proportionately more water than it did originally, but there will have been a far greater evaporation of ether than of alcohol, so that the whole of the conditions are entirely upset. Practically, therefore, in working emulsion with plates of large size, it is almost, if not absolutely, necessary to use a fresh portion for each, and to reject the surplus, as Mr. Green states he did. Of course this is not necessarily "waste" but it is practically so, for, for large plates, I question whether, by any process of "thinning" or readjustment, it could be brought into proper working condition again; and the best use that can be made of it is to extract its silver. This means the absolute loss of the remaining ether, alcohol, and pyroxyline, which, although they form the most costly portion of the constituents of the emulsion, are not economically recoverable, at least on a small scale.

I may have been a little over the mark in my rough and hasty estimate of the cost of producing negatives 24×18 thirty years ago, at least when the calculation is made on paper; but, on going over the matter more carefully, I do not feel inclined to "go back" on my first impressions. I am speaking, of course, of amateur work, by which I do *not* mean work that is "sloppy," and therefore more costly on that account, because the "sloppy" worker is not likely to turn out a 24×18 negative by any process at any price. But an amateur is denied many of the economies that are available on a commercial scale, for which reason his expenses are proportionately larger.

While I have been discussing large plates the modern tendency seems to be all in the opposite direction. The hand camera has been

with us for a long time, and was said to have "come to stay," but there seem to be signs of a resurrection of the stand, and that in future for all sizes of work the small camera and subsequent enlargement will, to a great extent, take the place of the larger sizes. I had intended saying a few words on that subject, but have already filled my allotted space. DOGBERRY.

THE COLOUR-SENSITISING POWERS OF SOME DYES ON COLLODION EMULSION.

A SIMILAR series of experiments to those already undertaken with gelatine plates will be of interest. Jonas's collodio-bromide emulsion, prepared with ammonio-nitrate of silver, with an equivalent quantity of zinc, instead of ammonium bromide, was used, and, after washing and redissolving in alcohol and ether, an addition of 0·05 per cent. of narcotine was made, and the whole allowed to ripen. The emulsion gave, when sensitised with eoside of silver, vigorous clean negatives, and showed a comparatively high sensitiveness.

After coating, the plates were bathed for two minutes in solutions of the dyes, then rinsed, and then placed in a solution of silver nitrate (1 : 4000) for one or two minutes, and then exposed damp. Hübl's glycin developer was used. Violet, B, and the corresponding ethyl dye (HCl salt), obtained from the Gesellschaft für Chemische Industrie, in Basle, acted vigorously, and, with the first dye, a dilution of 1 : 100,000 gave the best results. Two maxima were obtained, one at C and the other between D and E. With a long exposure, an almost continuous band, reaching from A to F, was obtained, when there was a small minimum, and then came the normal silver bromide maximum. The ethyl compound behaved in a similar way.

The blue and green diamine dyes obtained from L. Casella & Co. behave in an interesting way. These dyes are polyazo dyes, and give almost all useless results with dry plates, whilst when used in the described way with collodion emulsion, most of them give vigorous action in the orange, yellow, and red. These dyes require concentrations in which they cannot be used with gelatine plates, namely 40 to 50 c. c. of a 1 : 530 solution to 200 c. c. of water.

At this strength diamine blue gives, with collodio-bromide plates, a broad band, which, with long exposure, reaches from *a* to E, with two faint maxima, one at *c* and the other between D and E. Diamineazo blue acts in a similar way. Diamine steel-blue gives the most vigorous action, and the action of the red is far stronger than that of the blue. With a long exposure, a broad band of sensitiveness is obtained, which reaches from A to F, but, with only one maximum, from B to C.

Diaminogen blue is also a sensitiser for collodio-bromide. With a weak solution, as with gelatine dry plates, only a faint continuous sensitising towards the infra-red was obtained; with increasing concentration of the dye bath, the action of the blue was left behind, and a vigorous maximum at *b* appeared. When 40 c. c. of a 1 : 500 solution, with 200 c. c. of water, were used, if sufficiently exposed, a broad band from A, H, D ½ E, was obtained, and then the sensitiveness faded off to the normal sensitiveness of the collodio-bromide. With 80 : 200 only this band was left, the general sensitiveness of the plate was so lowered that the maximum of the silver bromide only appeared with a long exposure, whilst the sensitising band appeared quickly and vigorous. Of the other polyazo dyes, Chicago blue of the Berlin Actiengesellschaft für Anilinfabrication with a strength of 40 c. c. of a 1 : 500 solution to 300 c. c. of water, and a long exposure gave a broad band from A to D ½ E, with a maximum between C and D.

Zambesi blue, from the same firm, behaved in a similar way, but two indistinct faint maxima could be seen. The general sensitiveness was considerably lowered by this dye.

Several dyes of the Congo group have proved useful. Congo rubine of the Berliner Actiengesellschaft in a strength of twenty c. c. of a 1 : 500 solution of dye to 200 c. c. of water acts vigorously, and gives a band from B ½ C to beyond D, with a maximum at C ½ D. The action of the blue is very strongly lowered, and only comes into play with long exposure. The best formula for a bath with this dye is—

Solution of congorubin (1 : 500)	20 c. c.
,, ,, silver nitrate (1 : 2000)	200 c. c.

Cressyl violet (Mühlheimer Farbwerke) sensitises collodio-bromide in a solution of 1 : 200 and stronger, and with long exposure a continuous band from B into the violet appears, in which a maximum at C ½ D, and another between D and E, can be detected.

The patent dye, D. R. P., No. 86,225, placed on the market by Meister Lucius & Brüning, acts the same as with gelatine plates, only the action is much weaker. It gives a band from A to C ⅔ D, and with 40 c. c. to 200 c. c. of water, a tolerably indistinct maximum at C ½ D.

E. VALENTA.

BLISTERS ON CELLOIDIN PAPERS AND THE REMEDY.

THESE pests frequently make their appearance on collodion papers in the summer, and the causes are various. They may be due to a defective composition of the emulsion, but more likely defective preparation of the baryta paper, and also to the method of working. Too long washing of the prints, too high a temperature, or difference of the densities of solutions, as well as the composition of the gold baths, especially if long toning continuing for ten or twenty minutes is necessary, as well as a preliminary ammonia bath, all tend to produce blisters, which frequently only show after fixing when washing the prints; long continued washing of the prints in cold running water also helps.

It is seldom advisable in the height of summer to wash all the prints at once. Only one or two should be washed, and if these do not show any blisters then all may be treated. If blisters do show, then the procedure must be altered and in the worst cases preliminary baths of alum or formaline may be necessary.

In a test of some paper which showed marked blisters, a bath of formaline was found very effectual. After fixing, the prints were placed direct into the following :—

Water	100 parts.
Formaline 40 per cent.	10 ,,
Sodium sulphite	1–2 ,,

after about five minutes immersion the prints were washed as usual.

A very good remedy against blisters is the mixed alum and hypo bath as first suggested by me in 1889. By the addition of sodium sulphite potash and chrome alums and similar compounds may be mixed with hypo without the well-known separation of sulphur. To make this bath for collodion paper the following should be used :—

1. Water	500 parts.
Sodium sulphite	120 ,,
2. Water	1000 ,,
Potash alum	140 ,,
3. Water	1000 ,,
Hypo	200 ,,

For use, mix—

No. 1	50 parts.
No. 2	200 ,,
No. 3	250 ,,

after about five minutes the prints should be taken out of this bath and well washed. This bath should be used fresh every time.

The mixed alum and hypo bath is more convenient and cheaper to use than formaline solution. Formaline may be used in conjunction with sulphite in the fixing bath, but it is better to use it alone and it can be used before fixing.—*Photo. Correspondenz.* ALEX. LAINER.

THE OPTICAL EFFECTS OF INTENSIFICATION.

[Paper read before the Royal Photographic Society.]

IN January, 1888,* I published my first communication dealing with the mercury and ferrous-oxalate method of intensification, pointing out its advantages. In January, 1890,† in a paper read before this Society I dealt further with this and the sodium sulphite methods of intensifications. In January, 1893,‡ I communicated to this Society further details referring especially to the chemistry of various methods of mercurial intensification, and at the end of the same year these matters were more fully dealt with from a chemical point of view in a paper read before the Society of Chemical Industry.§ In April, 1894, before the Society of Arts,‖ I referred, among other subjects, to the revival of the old suggestion to use an alkaline developer instead of ferrous-oxalate to follow the mercuric chloride, and showed that such a method was quite unreliable. I have now the honour of laying before the Society the results of an investigation into the optical effects of the ferrous-oxalate

* *Photographic News*, XXXII., 18. † *Journal Photographic Society* (N.S.), XIV., ‡ *Journal Photographic Soc.* (N.S.), XVII., 95. § *Journal Soc. Chem. Ind.*, XII., ‖ *Journal Soc. Arts*, XLII., 472.

and some of the other common methods of mercurial intensification, and it is satisfactory to be able to say that these results fully confirm the inferences that I had based upon the examination of the chemistry of these processes. In some cases, indeed, they go further, and more emphatically show that the ferrous-oxalate method is the only kind of mercurial intensification that does not, by its very nature, give irregular effects.

The results that I have examined optically have reference to the treatment of the bleached image with (1) ferrous oxalate; (2) ammonia; (3) silver potassium cyanide; (4) sodium sulphite. The nature of these results, taken in conjunction with the chemical details already published, leaves practically no room for doubt as to the effects of the other rarely used reagents, so that I did not consider that it would be worth the expenditure of the further time that would have been necessary to include these in this present work.

Ferrous Oxalate.

As the chemical effect of ferrous oxalate upon the bleached image is perfectly straightforward, simple, and regular, merely removing the chlorine from the double chloride of mercury and silver and leaving the metals, I expected that the optical effect would be regular also, and endeavoured to determine its proportion. Messrs. Hurter & Driffield have shown that it is the opacity logarithms that must be regarded in such cases, and not either the simple opacity or the transparency. I sought, therefore, to discover the figure that the opacity logarithms should be multiplied by to give the opacity logarithms of the plate after intensification. In the experiments I used plates of different speeds by two makers whose plates are very different in character, and also lantern plates of a slow kind. The original negatives were developed with pyro and soda, metol, and ferrous oxalate, and I deemed this a sufficient variety of conditions to justify my generalisations.

The following table shows my results.

Treatment.	Including all experiments.		Select series of experiments.	
	No. of experiments.	Average multiplier.	No. of experiments.	Average multiplier.
1st	87	1·46	56	1 43
2nd	45	1·59	31	1 47
3rd	4	1·45	4	1·45
Total ...	136	1·50	91	1 445

Number adopted 1·45.

The experiments excluded from the figures of the last two columns are not excluded merely because they are discrepant, but because for one reason or another they are not as reliable as the rest. Some of the excluded figures agree excellently with the average, but an unreliable series was, of course, rejected entirely. The reasons why some were deemed unreliable were the use of very slight deposits in which the liability to error of measurement was of necessity large, and the want of sufficient care in some of the earlier experiments in the development and washing. Indeed one or two experiments were done rather as a preliminary trial than as a serious attempt to determine the multiplier. The second and third treatments mean that the plate had already been intensified once or twice before.

The agreement of the opacity logarithms calculated by means of this multiplier, and those obtained by experiment, is shown in the examples given below.

1.	2.	Calculated.	3.	Calculated		4.	Calculated.	
Original.	One treatment.	1×1·45	Two treatments.	2×1·45	1×1·45²	Three treatments.	3×1·45	1×1·45³
·14	·23	·203	·32	·333	·294	·44	·464	·427
·24	·34	·348	·50	·493	·504	·70	·725	·732
·44	·60	·638	·90	·87	·924	1·33	1·32	1·34
·76	1·04	1·10	1 60	1·51	1·60	2·53	2·32	2·32
1·06	1·49	1·44	2·44	2·16	2·23			
1·30	1·89	1·88	2·95	2·74	2·73			
1·46	2·15	2·12	3·25	3·12	3·07		$1·45^2 = 2·10$	
1·55	2·30	2·25	3·53	3·34	3·26		$1·45^3 = 3·05$	

This was a plate of ordinary rapidity developed with ferrous oxalate. Each exposure was double the preceding one.

The following was a lantern plate developed with pyro and sodium carbonate, and then washed two or three times in dilute caustic soda solution to get rid of a little staining matter in the plate that was present in spite of the presence of the usual amount of sulphite in the developer.

1.	2.	Calculated.	3.	Calculated.	
Original.	One treatment	1 × 1·45	Two treatments.	2 × 1·45	1 × 1·45²
·07	·10	·101	·15	·145	·147
·12	·17	·174	·23	·246	·252
·26	·37	·377	·54	·536	·546
·54	·82	·783	1·17	1·189	1·13
·81	1·27	1·175	1·84	1·842	1·70

The densest original square on this plate is of a marked yellow colour it is probable, therefore, that the opacity logarithm as estimated is too low and does not fairly represent the amount of silver present. The calculated figures founded on this observation are both low, but an exact agreement appears as soon as the yellow colour has gone, for the figure obtained experimentally for the second treatment exactly agrees with that calculated from the result of the first treatment.

It is, of course, possible to calculate the original condition of the plate from the results obtained after intensification. The figures are all opacity logarithms.

Original as measured.	Result of one intensification divided by 1·45.	Result of two intensifications divided by 1·45².
·07	·069	·071
·12	·117	·110
·26	·255	·257
·54	·565	·557
·81	·876	·878

The low figure obtained by measurement for the most dense square is here very marked. It is worth noting that the higher figure obtained from the intensification results gives a more even curve when the results are plotted, and this is additional evidence of its correctness. This method of intensification is thus likely to prove useful in getting at the real value of silver deposits that are not black.

There appears to be another reason why the densest part is sometimes inclined to be abnormally dense after intensification. It is a well-known fact that partially reduced silver chloride is very dark in colour; but, on the other hand, the white double chloride of silver and mercury is much more transparent than the metallic silver it is produced from.

When, therefore, the ferrous oxalate acts upon the bleached image, it is probable that the density increases gradually to a point beyond the final density, because of the incompletely reduced silver chloride, and then diminishes in density till reduction is complete. I have obtained actual evidence that favours this supposition, but it is difficult to prove it, because many experiments may be made without happening to catch the plate at the exact stage when the density is excessive. When a solution of mercuric chloride is applied to a negative, the first effect is a quite distinct darkening, and this is followed after a little time by the bleaching. Obviously, at first, the chloride and the metal are both present. The partially reduced salts of silver that Carey Lea calls photo-salts have great depth of colour. These facts confirm the supposition that metallic silver and silver chloride together, in certain proportions, are more opaque than the whole of the silver in the metallic form would be. If, therefore, the action of the ferrous oxalate is stopped immediately, the image is blackened through, there is not unlikely to be an incomplete action in the densest part, and consequently an excessive density. This accident appears to occur but rarely, and the way to avoid it is obvious. An incomplete washing away of the excess of mercuric chloride leads to a retardation of the action of the ferrous oxalate, and so favours the occurrence of this error.

To get exact results by intensification, it is obvious that the negative must be free from the dark-coloured products of the oxidation of the developer. The image should be of pure silver. The effect upon the result of a mixed or impure image cannot be predicted, except in the most general terms. Acid liquids will fix the colouring matter and lighten its colour, while alkaline liquids will darken it, and tend to dissolve and remove it. Ordinary hard water behaves as a weakly

alkaline liquid, because of the carbonate of lime that it contains. The best "clearing solution" that I know of, and I know it is a good one, is a weak solution of caustic soda. It must be weak enough not to injuriously affect the gelatine. Practically I find that about five drops of a ten per cent. solution to each ounce of water generally works well. The plate should be soaked in the solution for two or three minutes, and, if the liquid darkens, a fresh quantity is used. This is repeated until the solution ceases to become coloured, and the negative is then well washed.

The only other precaution that appears to be worth mentioning that tends to the getting of exact results is the soaking for two or three minutes in hydrochloric acid, about one to sixty of water, before applying the mercuric chloride. The mercuric chloride is, of course, itself acidified as usual. It is necessary to get quite rid of alkalinity before the mercury solution is applied, otherwise mercury compounds will be deposited in the film.

A microscopical examination of the results of intensification hardly leaves room for doubt that the increased opacity is due, at least partly, to an enlargement of the particles, though it is difficult to prove this by measurement, as they are of such various sizes in the same plate. Taking the specific gravities of mercury and silver as 13·5 and 10·5 respectively, and the bulks of equal weights as inversely proportional to the specific gravities, and multiplying these bulks by the weights involved, we find an increase in bulk of each particle of silver in the proportion of 2 to 5 by this process of intensification, assuming that the mercury and silver associate themselves together without change of bulk. Taking the square of the cube roots of these figures to get the sectional areas, we get a ratio of 1 to 1·84. The ratio found by experiment is, as above stated, as 1 to 1·45; but the calculated figure is based on the assumption that the mercury and silver combine without alteration in their bulks, and it is stated on good authority that there is considerable contraction in volume when these two metals combine. I hope to determine the specific gravity of the amalgam to see whether the experimental figure agrees with that obtained by calculation on the assumption that the effect is due to a simple increase in the size of the particles.

CHAPMAN JONES, F.I.C., F.C.S.

(To be continued.)

CONCERNING HALATION AND SOME ANTIDOTES.

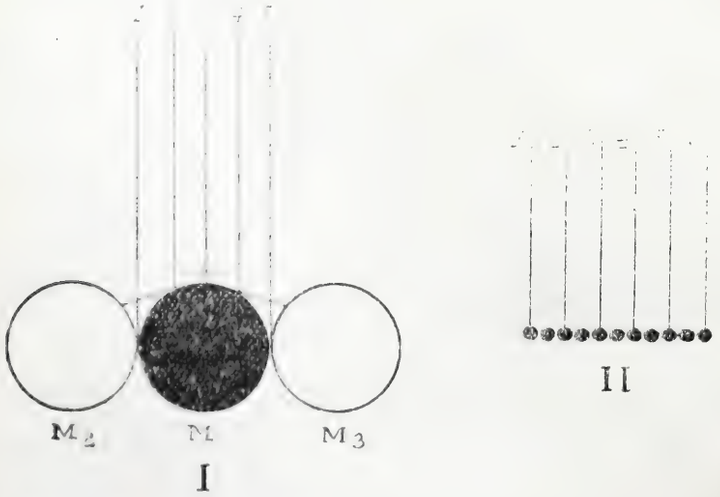
I.

WHAT is halation? As regards a negative, halation may, for the present purpose, be conveniently defined as the partial or complete obliteration of half-light or shadow. This is most liable wherever there is intimate contact of shadow with bright light.

Halation may be divided into general and local.

GENERAL HALATION

manifests itself in all subjects by an eating away of half-lights. In bad cases even deep shadows become veiled. This form of halation is attributed to granular reflections, and will, therefore, be mainly noticeable in coarse-grained plates. The accompanying figure (1) will perhaps make this more clear to the reader; we suppose that the rays proceeding



from the light part of our object, 1, 2, 3, 4, 5, fall upon a large granule M, whilst the rays from an adjacent dark part fall upon M2 and M3. It will follow that, in obedience to optical laws, rays 2 and 4 will be reflected (either in part or whole) and exert an action upon granules M2 and M3 which will cause them to darken. On the other hand, if we suppose that the granules are much smaller (see fig. 2), it will be seen that any reflection is much less likely to impair either the vigour or the sharpness of the shadows. So far no count has been taken of the part played by the reflection of light scattered by granules from the back of the plates, which is of all causes probably the most prolific.

LOCAL HALATION

is much aggravated by a coarse-grained film; at the same time, apart from any fineness of grain, it appears to be very much dependent upon (*a*) the thinness of the film, (*b*) the colour of the film, and (*c*) the reflective capacity, as regards actinic rays, of the back of the support.

It is just as well that the reader should grasp the above factors. Thus, if a film is exceedingly thick, comparatively little actinic light will reach the back; wherefore, under ordinary circumstances, halation will not be noticeable or harmful.

Hence, for one reason, why a thickly coated "landscape" plate is preferable to plates which have but a very thin film.

Again, if the film, although a thin one, is, in a large measure, impervious to the passage of actinic (violet-blue) rays, then, notwithstanding its thinness, the halation will be less strongly marked than otherwise; for which reason certain plates stained with the primary object of obtaining so-called isochromatic renderings are obviously less likely to show halation produced by reflection from the back of the glass than would ordinary plates. Furthermore, the gelatino-bromide emulsion assumes various colours by transmitted light according to the process of manufacture. Broadly speaking, it may be said that the slower the emulsion the less pervious it is to actinic light.

That is to say, whilst a plate of the extra-rapid type will allow nearly all bright actinic light to go right through it, a plate of the ordinary slow speed will, on account of the colour of the film, cut off a considerable proportion of the light which imprints an image upon its surface.

A rapid plate transmits mainly blue, a slow plate mainly purple lake, a lantern plate mainly red light.

How much active light may pass through a very fast emulsion may be conveniently tested by means of a couple of extra-rapid celluloid films, placed either face to face, or face to back. Even in the latter case, although the celluloid somewhat cuts down the actinic energy, it will be found that, given a fair amount of exposure, the underneath image is developable to an almost full average of intensity and range usually found in a negative.

We shall, later on, see how, taking advantage of the above influences, certain improvements in the anti-halation properties of plates have been perfected.

Most authorities agree that the chief and most hurtful source of local halation is attributable to the reflection which takes place from the back of the transparent support upon which the gelatino-bromide emulsion is spread.

Whenever a ray of light passes from glass into air, it becomes either refracted or reflected, according to the angle at which it strikes the surface at which it emerges. Let the shaded part of the accompanying

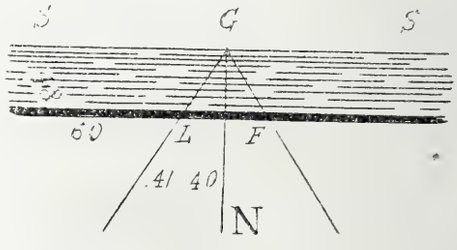


figure represent the section of a sheet of glass; then, if a line, G N, be drawn perpendicularly to S S, any ray of light striking at G, and making, with G N, a larger angle than L G N (41·4°) will not pass out into the air, but will be what is called "totally" reflected from G to F. From the foregoing it will be seen why brightly illuminated granules of the emulsion, which are adjacent to the glass, and which reflect rays in every direction, will bring about halation, which (see figs. 1 and 2) will be, to a large extent, proportionate to the coarseness of the "grain" of the plate. A portion of the light given off, about half will pass out by the back of the glass; the rest will be reflected at the surface, S S, and illuminate various granules of the emulsion which lie next to the glass. Halation of this origin being set up from the *back* of the film

xplains why a much-forced negative is apt to show more halation than n unforced one. In the latter case the image is developed mainly from he top, which, if the film is not an unusually thin one, is not likely to e much affected by the comparatively weak light rays which have been eflected from granules at the back of the film *viâ* the back of the glass o other granules, which latter will permanently reflect or absorb a large roportion of such light as reaches them.

There is yet another contributing cause which, at times, probably xercises more influence than has been credited.

That is the inductive action of molecules upon their neighbours. Whatever may be the precise effect produced by light in forming a latent, r invisible, developable image, there is small doubt but that the change which is set up in those portions of the sensitised film upon which light alls is in part transmitted; just as heat, not to say other modes of nolecular motion, is more or less, according to circumstances, conducted rom one to another molecule.

It is probably due to this spreading action that may be ascribed the henomenon, well known to practical workers, whereby a somewhat nder-exposed plate is, by being kept for a few weeks between exposure nd development, made capable of yielding a negative of similar quality o that possessed by a properly exposed plate.

This "continuing" action is better known where a carbon tissue has een exposed under a negative, in which case it is familiar knowledge hat less than half the exposure needful where development at once ollows is requisite, if the exposed "tissue" be set aside for, say, six- een hours. Granting that action analogous to that of light can be thus et up, it is easy to imagine how, when a plate is being exposed upon a ubject which includes light shining through a brightly illuminated window, this will exercise such an energetic influence upon the molecules n the immediate neighbourhood, *i.e.*, those which form the dark frame- work and sashes, &c., that the phenomenon known as halation is, to ome extent, likely to be caused by this alone. Moreover, this injury is ikely to be considerably aggravated by delaying for any considerable ime the development of a plate, and by using an unusually sensitive late; for in the latter case the tendency of the silver bromide to latent pontaneous reduction, in the presence of air, is so great that the small dditional stimulus to this, afforded by the neighbouring change going n where bright light has acted, is likely to be much more pronounced han if a slower emulsion were in use. HECTOR MACLEAN, F.R.P.S.

FERRIC SULPHATE AS AN ETCHING AGENT FOR METAL.

WHEN a solution of ferric sulphate in water is allowed to act on some netals the sulphate of the metal with ferrous sulphate is formed, and here is more or less energetic etching.

This decomposition is expressed by the formula—

$$R'' + Fe_2(SO_4)_4 = R''SO_4 + 2FeSO_4,$$

nd there is no evolution of gas, and with the zinc and copper plates, as sed for relief-printing plates, no substance insoluble in water is formed, which is the reason why, when ferric sulphate is used for etching, such lean, blank, etched surfaces are given. This is not the case when erric chloride is used for copper etching, as the very slightly soluble uprous chloride is formed, according to the equation—

$$Fe_2Cl_6 + 2Cu = Cu_2Cl_2 + 2FeCl_2,$$

nd this cuprous chloride has to be removed with a brush. That the ontinuous formation of the insoluble cuprous chloride is prejudicial to he even action of the etching fluid is obvious, and ferric sulphate might ell replace the chloride, only it is uncommonly slow in its action.

Experiments have proved that the results obtained with ferric sulphate re very beautiful, but I have not succeeded in obtaining a considerable astening of the etching process by alteration of the concentration of the tching fluid, and the etching of a half-tone block on copper with a twenty o thirty per cent. solution of ferric sulphate took over an hour.

This slow action does not make it very useful in practice, but it is of alue when copper plates have to be etched blank. In practice it is ustomary to clean the burnt-in enameline copper plates with very ilute potassium-cyanide solution, in order to retouch it better or to stop ut. Potassium cyanide is not only very poisonous, but it attacks also he finest dots of the enamel image if it is allowed to act too long. With solution of ferric sulphate a clean blank metal surface is quickly btained without any of the disadvantages of the use of cyanide.

Experiments are in hand as to the applicability of this agent for zinc tching, and a further report will be made. E. VALENTA.

PRINTS IN TURNBULL'S BLUE.

[Translated from the Photographisches Wochenblatt.]

THE efforts of amateur photography have been chiefly directed to new printing methods, which, by variety of tone, surface, and finish, would afford the means of adaptation to the subject, and thus supplementing the old printing processes characterised by brown tones and highly glazed surfaces. At the same time the endeavour has not been excluded to increase the quality and permanence of the print. Art photography must remind us as little as possible that its productions are mechanical, and to-day the desideratum is that they shall appear "unphotographic." To attain this end, the new school has already devised a number of most diverse printing processes, of which, doubtless, photogravure yields the most artistic effects; yet the difficulties by which it is surrounded remove it from the sphere of many. Some have sought, by more simple or cheaper means, to obtain similar effects, and from time to time fresh processes are published.

A printing method that may be classed with those we have characterised is the process in Turnbull's blue. Although first recommended by Herschell in the forties under the name of cyanotype, little attention has been bestowed upon it by photographers. Yet it may be termed almost classic, within the limits of its splendid cobalt blue colour, if we think of its wonderful simplicity, its great cheapness, and the quality and permanence of its pictures, rendered, as if by magic, in intense blue upon pure white paper, and in such a manner that neither hot nor cold water will affect them. The skilful amateur can produce a print in eight or ten minutes upon any sheet of paper that may take his fancy. This time will suffice to prepare his sheet of Rives writing or letter paper, to make a print, fix it, and then dry it off by heat. When travelling, the process is most acceptable, if we wish to make a print quickly and without trouble, from a fresh negative. But these considerations do not concern me at present, my aim being to point out that the process may be used for making most serviceable, effective pictures, if the subjects are suitably selected.

The fine blue colour of these pictures is Turnbull's blue, a precipitate insoluble in water, produced by the admixture of solutions of red prussiate (ferricyanide) of potash and ferrous salts. The production of the picture is explained as follows: If light is allowed to act upon certain salts of iron, in which the metal is present in the ferric state, they are reduced to ferrous combinations, which give, with red prussiate of potash, the above-named blue insoluble precipitate (Turnbull's blue). Ammonio-citrate of iron is one of these iron salts. If a solution of this is mixed with a solution of red prussiate of potash, no precipitate is at first formed, but we have a yellowish brown fluid. If this is brushed upon paper, dried, and exposed to light, the ferric salt is reduced to the ferrous state, and, in conjunction with the red prussiate of potash, produces the blue precipitate, Turnbull's blue, which becomes apparent upon immersing the paper in water. Both salts are then in solution, and combine more readily. If the exposure has been made under a negative, the reduction will correspond to the amount of light transmitted, and those portions that have been protected will be freed from the mixture of ferric salt and ferricyanide of potash, when the prints are washed.

Plain and simple as this explanation may seem, it was discovered with much difficulty. In 1724 a process was discovered, by accident, of making a similar blue dye stuff, Prussian blue, also a cyanogen combination; but more than a hundred years passed away, until in recent times, with much labour and strenuous investigation, theoretical chemists obtained a complete insight of the chemistry of the cyanogen combinations, which to-day play such an important part in the arts. This also enabled them to explain processes such as the one under consideration and to perfect them.

A very important factor in the success of good prints is the quality of the paper. Papers of different make will give different results although similarly prepared. A good paper made from rags and having a woolly appearance by transmitted light should be used. It should contain but little wood pulp, should be lightly sized, and not highly glazed. Plain Rives paper (a rather thick kind weighing 19 kilos, unsized) is the best, but Steinbach's or Schleicher & Schüll's of Düren, or even that which is known amongst the best stationers as normal writing paper, No. 1, are also quite suitable. The paper is fastened upon a drawing board with drawing pins, a sheet of blotting-paper being interposed. It will be found advantageous, especially with kinds having a close texture, to first dip the sheets in water, and dry them off between blotting-paper, to render them more manageable.

The coating of the paper with the solution must be done very evenly, so that there may be no brush marks or insensitive patches. The brush

must be perfectly clean. I prefer to use a thick, short, soft-haired brush, such as is used for varnishing. If a large surface has to be prepared, the solution may be first spread upon the paper with a sponge and then equalised with a brush. Sizes up to 25 × 33 c., quarter-sheet of Rives, can be prepared with greatest success and evenness. Flotation for three to five minutes upon the solution is also a successful method. The drying may take place in the air, in an oven, or before a fire. The sensitising must be done by gas or lamp-light, or by very subdued daylight, and the paper must be dried in the dark.

Printing must be done in diffused daylight, under tissue paper, or in direct sunlight. The print is finished when the shadows assume a silver-grey or bronze tone.

Development takes place by simply washing in water. It is preferable to begin with tepid water and to use frequent changes, to obtain pure whites and to prevent any subsequent degradation. The prints thus obtained are permanent, and can be dried in any way that may be desirable. They are of a very fine, plucky, dark blue colour, with a coppery lustre in the shadows, and can be modified to other tones.

For the sensitising solution mix by artificial light :—A. 15 grammes green ammonio-citrate of iron* in 50 c. c. water; B. 8 grammes red prussiate of potash in 40 c. c. water. Filter both solutions, mix and keep them in a yellow bottle in the dark. The addition of 1 gramme of bichromate of potash to each 900 c. c. of solution increases the keeping property of the paper. The solutions will keep a long time, likewise the mixture, but the latter must be filtered frequently. The solution of ferrid salt by itself inclines to mouldiness, but I prevent this by adding five per cent. of alcohol. Other antiseptics are injurious to the solution.

The prepared paper is yellow with a slight greenish tinge. It must be preserved carefully from daylight, and will not last long.

If pure chemicals are used, to which special attention should be given, the mixture is a clear brownish-yellow. If the red prussiate is insufficiently pure, the solution is yellowish-green, instead of brownish-yellow, and the salt is unsuitable. By warming and adding a few drops of bromine water, which may be had at any chemist's, the requisite condition may be restored, in the same way as the red prussiate is manufactured from yellow prussiate of potash, with chlorine or bromine. Hence paper that has been strongly bleached with chlorine is not undesirable with this process. If the crystals of red prussiate are decomposed at the surface (greenish), they should be washed before use. The ammonio-citrate of iron may also be impure and contain ferrous salt, the mixture is then a pronounced green-blue colour and produces bad prints.

If it is necessary to intensify prints, they should, after careful washing, be dipped in a weak solution of chloride of iron (about five grains to the litre of water). Ferric citrate or ferric sulphate in similar weak solution will also answer the purpose, likewise dilute hydrochloric acid.

I have found that dipping the prints in a solution of sulphocyanide of potash and subsequently washing will intensify the tone, and at the same time give greater vigour to the print.

On the other hand, prints may be reduced by prolonged washing, immersion in a weak soda bath, or very dilute ammonia. Oxide of iron being thrown down from the decomposed Turnbull's blue, the prints have a grey tone, but this may be removed by dilute hydrochloric acid.

To make corrections or write inscriptions on the prints in white, a solution of oxalate of potash (4 grains in 100 c. c. water) may be used.† To write in other colours, a transparent solution of suitable dye must be added.

For retouching the picture, the colour could easily be prepared by the photographer, as it is well known that ferrous salts (for instance, ferrous sulphate), with red prussiate of potash, produce the blue precipitate, the ferric salts with yellow prussiate. But I may mention that I have filled in small defects with greater ease and safety with blue pencil or colour.

Prints in Turnbull's blue will be used mostly for small sizes, not exceeding 13 × 18 c., as the cobalt blue would be very intense with larger sizes; but it is different where we have the possibility of changing prints made with such ease, to a neutral colour, by an equally easy procedure. The following few directions will make the process of greater value to many.

If tobacco smoke is blown on a blue print, it will assume a transitory, beautiful lilac tone. I have obtained this lilac colour in various shades in a permanent way by laying the print in a hot solution of acetate of lead (liquor plumbi subacetici, sp. gr. 1·24, obtainable at any chemist's).

Very short immersion in a cold bath of the same will also produce a marked change of colour. After this bath, the prints should be well washed. Upon dipping these blue-lilac prints in a thirty-five per cent. solution of sulphocyanide of potash, then drying between blotting-paper without washing, I have obtained still different tones upon exposure to sunlight. The prints then assume a more rosy tone.

Weak solutions of borax, oxalate of potash, or ammonia, also produce a tinge of lilac.

The following colour variations are interesting, and I have obtained them, by means of a thirty-five per cent. solution of sulphocyanide of potash, from Turnbull's blue. They vary between pale and dark moss green, green-black, and violet-black. I immersed the freshly developed blue print (of full vigour, as it loses somewhat) from one to five minutes in the solution of sulphocyanide of potash; the longer the immersion, the paler the result. I also floated the print, image downwards, and then, without washing, blotted it between fresh sheets of filter paper. It was then dried before a fire and exposed to the sun or strong daylight. Up to a certain point the print became lighter, and it then stopped; but, curiously, it recovered in the dark, that is to say, the tone became deeper. This recalls an analogous experience noticed some years ago with ladies' dresses dyed with cyanogen blue. As the sulphocyanide of potash is very readily washed out of the prints, and the tone thereby disappears, these pictures, unfortunately, are affected by water, which will produce spots. They are still more susceptible to ammonia, and, as perspiration contains ammonia, it is necessary to carefully avoid touching them with moist fingers (as a precaution I powder my hands); but they are most susceptible to chloride of iron, the slightest trace of which will produce spots. A ten per cent. alum bath and subsequent washing, before using the sulphocyanide bath, produces a rather more fiery tone, and the same bath restores an unsuccessful sulphocyanide picture to the original blue.

The finest effect, however, is obtained if a few drops of acetate of lead are added to the sulphocyanide of potash bath, in which the print is being rocked. After a few minutes the print should be removed and pressed between clean filter paper, then dried before the fire and exposed to light. A peculiar brilliant black is obtained, passing over to lilac in the high lights, and the print is of exceptional vigour. The bath must be fresh for each set of prints, as it rapidly decomposes, and it should be made with care, as directed. Numberless variations of colour are possible, according to the amount of lead acetate, length of immersion, &c. The print should be mounted with thin glue or gum arabic.

The bright tone will be found very pleasing, and I believe the process will be of use, notwithstanding its drawbacks; but, for success, it is necessary to adhere strictly to definite periods of immersion, to the drying and exposure of the prints, and also to see that the materials and paper are of the purest, and that the utensils are perfectly clean.

Oscar Bolle.

(*To be continued.*)

* There are green and brown varieties of ammonio-citrate of iron, and for some time past preference has been given to the green, owing to its greater sensitiveness. The chemicals may be obtained from J. F. Schippang & Co., 24, Prinzenstrasse, Berlin.

† This reducing property of oxalate of potash might well be used to produce a pen drawing from a blue print. If the drawing is made over the blue print in Indian ink, and the print then immersed in oxalate of potash, the photograph would be destroyed and the pen drawing remain.

THE AUTO-ACETYLENE GAS-GENERATOR.

In December last year we described the general construction of the Auto-acetylene gas-generator of the Scottish Acetylene Gas Company, Glasgow. Since then, the apparatus, though it remains the same in construction and appearance, has been improved in its details. The larger sizes are provided with an efficient means of keeping the gas cool during generation by a small but sufficient circulating stream of water. In the smaller sizes the water chamber surrounding the generator contains an ample quantity for the purpose.

We are informed that several of the most important fire-insurance companies have removed all restrictions to the use of the generator, and that gradually the others are recognising that the generation and use of the gas with reasonable precaution is not attended with danger.

With calcium carbide at 2½*d.* per lb., the present price, the cost of lighting by acetylene is exactly the same as with ordinary gas at 2*s.* 6*d.* per 1000 feet, and, as, after having been charged, the action of the generator is automatic, the use of this gas should increase in popularity where ordinary gas cannot be laid on, and in localities where the price is high. The smallest-size generator for house lighting provides for a supply with five burners of sixty candle-power light for five hours. The gas-holder is 2½ feet in capacity. Two generators are fitted, the second of which is automatically brought into action when the action of the first ceases through exhaustion of the material.

The light is successfully employed for portraiture, and outfits are supplied fitted with twenty-four or fifty burners. The special generator for photographers' use is designed to give a large supply of gas for a short time.

For the optical lantern a portable form of generator is made, which ems fully to answer its purpose. All the forms will allow of recharging ile the light is burning.

THE LUMIÈRE CINÉMATOGRAPHE.

UR first feeling on being shown the cinematographe of Messrs. Lumière ses Fils at the office of their London agents, Messrs. Fuerst Brothers, 17, Philpot-lane, E.C., was one of surprise at its compactness. The strument is not larger in size than many quarter-plate hand cameras hich have been popular, and only a little in excess of them in weight; evertheless, it includes in itself the means of exposing the film which is form the negative, of printing a positive from the negative after it has en finished, and, with the addition of a lantern for providing the light, displaying the positive upon a screen.

For the purpose of taking the negative, the holder of the roll of film hich is to be exposed, and which may be compared to the dark slide of n ordinary camera, consists of a small square box. This must have the ll of film inserted in the dark room, leaving an end free for attachment the running gear of the apparatus. The view having been focussed, ne attachment and adjustment of the loose end of the film to the nning gear is effected very simply and quickly, and it is led thence to box containing a roller to receive it after exposure. Both the roll-older and receiving box are light-tight, and the number of films that an be exposed without visiting the dark room is simply dependent upon ne number of charged roll-holders and receivers at hand.

For printing the positive, an arrangement is made for passing the egative through in contact with a sensitive film, the sensitive film being upplied from, and received into light-tight receptacles. In this peration the lens is removed, and any suitable light may be employed or the exposure.

When used for projection, the instrument is placed on a stand in front f a lantern containing an electric arc lamp, having efficient mechanism or adjusting and centering the light. The condenser employed onstitutes a feature of novelty. In employing an ordinary condensing ens, to prevent the concentrated heat rays from destroying the film, it as been found necessary to interpose a trough containing water or a olution of alum. Messrs. Lumière combine the trough and condenser, nd their improved form of condenser consists of what is practically a pherical water bottle, having a neck like an ordinary water bottle. This form of condenser has obviously the advantage that, being made of hin glass, the loss of light through the colour of the glass employed is ninimised, and at the same time most of the heat rays are absorbed. t requires about an hour of constant exposure to the electric arc to aise the water to the boiling point.

We examined a number of films of interesting subjects, and among hem a series of the royal procession, taken on the Jubilee Day. All of hese were capital as photographs, and singularly free from the usual blemishes.

THE LATE GEORGE DAWSON.

We are sorry to announce the death, on Monday last, July 12, of Mr. George Dawson, M.A. The deceased gentleman, who was in his seventy-seventh year, will be remembered by reason of his long association with King's College in the capacity of Professor of Photography. He was formerly one of the editors of THE BRITISH JOURNAL OF PHOTOGRAPHY, and was joint author, with the late Thomas Sutton, of *The Dictionary of Photography*. He also edited one of the earlier editions of Hardwich's *Photographic Chemistry*. A more detailed notice of the deceased gentleman will appear in our next.

THE SANDELL PHOTOGRAPHIC EXHIBITION.

THE Sandell Works Company are evidently believers in the policy of giving a practical demonstration of what can be accomplished by the aid of the Sandell plate as their best advertisement. Following the Exhibition held at the Company's works at Selhurst-road, South Norwood, in the spring of this year, and which we noticed at the time in terms of praise, an Exhibition is now open at the Modern Gallery, 175, Bond-street, W., at which the same pictures are on view.

We can only repeat that the collection is characterised by singular excellence. The subjects are mostly architectural, and there are many of the pictures, particularly those of interiors, which are really marvellous specimens of photography. The majority of the exhibits are the personal work of Mr. J. T. Sandell, and they bear as eloquent testimony to his skill as a photographer of architecture as to the valuable properties of the plates upon which they were produced.

We can confidently recommend a visit to this Exhibition to those who admire architectural photographs, and still more strongly to those who aspire to produce architectural photographs themselves. The latter can hardly fail to learn something of practical value in studying the works in conjunction with the details as to their production given in the catalogue, for, in each case, the plate used, time of year, hour of day, atmospheric conditions, lens and stop, are set out.

The Exhibition is open daily, and also in the evenings from seven to ten. On Wednesday and Saturday evenings there are lantern displays at eight p.m., and demonstrations at nine p.m.

News and Notes.

MESSRS. FUERST BROTHERS write: "It will interest your readers to know that we have reduced our price of the Jubilee film views (Lumière and Edison perforation) to 3*l.* 2*s.* each.

THE Queen and the Princess of Wales have been pleased to accept proof photogravure copies of the *Graphic* prize photograph, *Worn Out*, by Mr. Henry Stevens, of Addlestone.

A NEW photographic telescope is being made for the observatory of Cambridge University by Sir Howard Grubb, and the building for its accommodation will be taken in hand this summer.

MESSRS. WIGGIN & SON, of St. Matthew's, Ipswich, write: "If you will intimate in this week's issue that we shall be glad to place our dark room at the disposal of any Conventioners visiting Ipswich on Saturday next, it will probably be useful to some of your readers."

A CORRECTION.—Messrs. Fortescue Wetherman & Co., Limited, collochrome printers, of Chase Side, Enfield, write: "You have made a mistake in your notice of our Company in last week's JOURNAL. The capital is not 1000*l.*, but 8000*l.*, and our main business is that of collotype printers. No shares whatever were offered to the public."

A MONUMENT to the memory of Daguerre has been erected by public subscription at Bry-sur-Marne, and the inauguration ceremony was performed on Sunday, June 27. The memorial takes the form of a bronze bust placed on a stone pedestal, and is the work of Madame Bloch. At the close of the ceremony wreaths were placed upon Daguerre's grave.

ROYAL CORNWALL POLYTECHNIC SOCIETY, FALMOUTH.—The Sixty-fifth Annual Exhibition of this Society will open at Falmouth, on Tuesday, August 31, 1897. Medals and prizes are offered in the class for Photography, which is to include photographs by professionals and amateurs and photographic apparatus. List of prizes and all further information may be obtained from the Secretary, Mr. Edward Kitto, F.R.Met.S., the Observatory, Falmouth.

THE Eastman Photographic Materials Company have just paid an interim dividend, on account of the year 1897, of ten per cent. This dividend has been declared and paid, not only upon the preference but also upon the ordinary shares. Whilst referring to the Eastman Company, we may also notice another indication of enterprise and prosperity, namely, the magnificent electric sign which has this week been started in Trafalgar-square. The sign consists of the word "Kodak," in letters seven feet high. By day it is seen as a bright golden word, and by night it flashes the Company's trade mark in the view of crowds at the heart of London.

MR. F. H. WRIGHT writes to the *English Mechanic*: "Why do not professional landscape photographers make it a rule to mark on each plate the exact direction of view? I was examining a number of Continental photographs recently, and, while there is, doubtless, a large percentage of persons to whom a photograph of some town, building, lake, or harbour, is simply that and nothing more, there are many others of a more observant nature, to whom the value of such pictures would be greatly enhanced if they were sure of their position. In a few cases the time given by some clock, which, fortunately, has been included in the photograph, considered in connexion with the shadows, gives one an idea of the points of the compass; but I do not think it should altogether be left to hap-hazard."

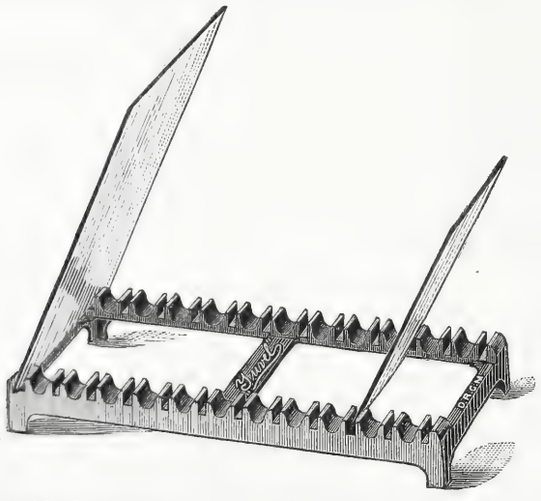
MILLIONS' WORTH OF ARTICLES IN DANGER.—The Select Committee of the House of Commons appointed to inquire into the management of the Museums of the Science and Art Department sat again recently, Sir John Gorst in the chair. Sir John Taylor continued his evidence. Sir Henry Howorth examined the witness at some length with respect to danger to South Kensington Museum from fire. Sir Henry said it appeared strange to some members of the Committee that a building containing some three to five millions' worth of articles should have been in a desperately dangerous condition without any report having been made by the Board of Works. When an expert was called in, he at once suggested the removal of certain buildings. Sir John said the Board of Works had previously recommended the removal of certain buildings.

WEINEK'S LUNAR ENLARGEMENTS.—Selenographers will be glad to hear that Professor Weinek proposes to publish a Lunar Photographic Atlas, which will contain an accurate and artistic representation of the whole visible surface of the moon. The materials that will form the basis and bulk of this Atlas have been mainly derived from the series of negatives of the Lick Observatory, which have been enlarged twenty-four times. The maps will be printed by the phototype process direct from Professor Weinek's enlarged glass diapositives, and will be constantly under his supervision and control during their reproduction by the Art Photographical Institute of Carl Bellman in Prague. The proposed scale of the Atlas will be four metres to the diameter of the moon; there will be in all 200 maps 26×31 cm., and each sheet will give the selenographical latitude and longitude for the centre of the picture, and also the selenographical longitude of the terminator for the latitude of 0°. This will greatly facilitate the arrangement of the sheets according to the relative positions of the lunar objects they portray. The publication of such an

atlas as this, which requires a great deal of outlay, cannot be undertaken unless a considerable number of subscribers are forthcoming. Professor Weinek appeals in the first instance to all the observatories of the world to become subscribers for the ten issues, each to contain twenty lunar landscapes. There should be no difficulty in obtaining a sufficient number of applicants, as such a useful and epoch-making publication in selenography should be in the possession of every observatory.—*Nature.*

At the *Conversazione* given by the Society for Promoting Christian Knowledge to the Colonial Bishops on Thursday, July 8, at the Drapers' Hall, we note that among the entertainments provided there was a grand display of Geissler's tubes, Crookes' radiant-matter tubes, containing minerals, shells, &c. One very beautiful new tube was shown of a bunch of flowers stamped up in metal and coated with various fluorescent materials, so that, when the current was passed through the tube, these gave the natural red, green, and blue colours of great brilliancy. The Röntgen X-ray apparatus was also exhibited, the usual things being shown—bones in hand, contents of a bag through a thick block of wood, &c. These were exhibited by Messrs. Newton & Co., and created much curiosity amongst the colonials, the majority of whom had not seen them before. All the apparatus was under the charge of Mr. T. E. Freshwater. Photography was well represented by Mr. Birt Acres with his cinematograph. His well-known films of *Breaking Waves, Garden Party at Marlborough House, The Boat Race,* and *Highgate Station,* &c., were shown. The last-mentioned was much applauded as the smoke issued from the tunnel long after the train had left, but, when he showed his new picture of the Jubilee Procession, the excitement grew more and more intense as it passed along. Many of the faces were distinctly visible, and when the foreign princes passed along, and the cream-coloured horses came in view, drawing the carriage in which was seated Her Majesty the Queen, there was one great outburst of cheering. This set of pictures was shown several times during the evening.

The "Jewel" Plate Rack.—Some few weeks ago, Mr. C. A. Rudowsky, of 3, Guildhall-chambers, E.C., exhibited to us this extremely convenient plate rack, which, as the illustration shows, consists of a notched rectangular



frame that holds the negatives at an angle. The rack is made of iron, and it is very firm, so that the risk of breakage is minimised. The Jewel plate rack forms a useful and compact addition to one's dark-room *impedimenta.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
19	Bradford Photo. Society	*Bromide Enlargements.* C. C. Vevers.
19	Southland	Clouds and Moonlight Effects.
19	South London	*Halation: Suggestions for its Prevention, and their Effectiveness.* C. H. Oakden.
20	Aintree	*Printing and Toning.* A. G. Ashley.
20	Brixton and Clapham	*Pictorial Photography.* A. Horsley Hinton.
20	Gospel Oak	*An Evening with Hand Cameras.* P. G. Mason.
20	Hackney	Demonstration: *Bromide Enlarging.* Walter L. Barker.
21	Photographic Club	Open Night.
22	Bradford Camera Club	*Toning and Improving Platinotype Prints.* Walter Booth.
22	Polytechnic	Consideration of Club Card.—H. A. Baxter will Develop a few Members' Plates.
24	Aintree	Excursion: Speke Hall. Leader, C. H. Adkins.
24	Birmingham Photo. Society	Excursion: Welford-on-Avon. Leader, G. A. Thomason.
24	Hackney	Excursion: Rainham. Leader, H. W. Dunkley.
24	Oldham	Excursion: Chester. Leader, T. Burton.
24	Polytechnic	Visit to the Zoological Society's Gardens.
24	South London	Excursion: Southfleet. Leader, C. H. Oakden.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 8,—Mr. A. Mackie in the chair.

Mr. J. E. Hodd desired to have some particulars of an old lens bearing the name of Andrew Ross, which he handed round.

The Chairman believed it to be a lens called the Orthographic, of the Petzval type. It was necessary to use the same stop with which the focussing was done, different stops causing an alteration in the focus.

Mr. P. Everitt remarked that it would be about thirty years old.

It was ascertained that the lens was of thirty inches back focus.

Mr. F. G. Archer showed a print and drew attention to its uniform yellow tint. It had been printed to great depth and, without toning, had been placed in the fixing bath, where it was left for ten hours, assuming in that time its present colour and almost a normal appearance as regards depth of printing.

The Chairman exhibited a piece of a Lumière cinematographe film containing six pictures said to be taken each in one twenty-fifth of a second. Any appreciably slower speed would tend to cause jerkiness on the screen, due to the insufficiency of the pictures projected in a given time.

Mr. E. T. Wright started a discussion of some interest to film-workers. He showed a length of film negative which was covered with innumerable minute spots, which were not noticeable when it was hung up to dry after the developing operations, but made their appearance by the time the film was dry.

Various suggestions of the cause were forthcoming, amongst them being air bells due to development, bubbles in the emulsion, abrasion or other physical cause. It was likewise stated to be due to undissolved silver bromide in the film, the result of imperfect fixation. Meanwhile an experimental examination was being made, and later in the evening,

Mr. A. Haddon asserted the appearance to be traceable to the presence of large numbers of bubbles in the celluloid film itself.

The Chairman showed a bromide print, on paper some ten years old, developed with an ordinary pyro-soda developer, and of a very nice and pleasing colour.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The Council of the above Society, adopting the arrangements of previous years, have held the ordinary monthly meetings out of doors, in the form of a photographic picnic, ladies and friends being invited, and the business of the meeting being conducted after tea. The previous meetings this year have been to Bakewell for Haddon Hall, and Alton for Croxdon Abbey, both these outings not being so well attended as last year's rambles, owing, no doubt, to the long distance from Manchester. Owing to the Hon. Secretary (Mr. C. H. Coote) being away on his holidays, the late Hon. Secretary (Mr. A. Casson) took the present outing in charge, and, in the way only known to himself, made it a complete success. The ramble was to Plumbly, and on Saturday the 10th instant, the 1.30 train had, in three reserved carriages, twenty-seven members and friends. Alighting at Plumbly, cameras were soon at work on a roadside pool fringed with rushes, and on the water ducks were disporting themselves; continuing along the road till a by-lane was reached, which what with half-timbered cottages and the hedges lined with honeysuckle, wild rose, and fox-gloves, proved of much interest to the camera men. Crossing over rich meadow grass, a stream was reached, spanned by a rustic wooden bridge, and, when some calves had been driven into the water, many of the party were in danger of exposing all their plates. By this time many were the whisperings amongst the ladies of tea, so all haste was made to the Smoker Inn, where substantial fare was provided by host Newton. After a rest, Holford Hall and Mill were next visited, where a group was taken. The Hall is one of the few half-timbered old halls in existence, and is even now in daily danger of being altogether ruined for photographic purposes. The way now lay, through fields of grain and leafy lanes, to the station, Manchester being eventually reached about 9.30 p.m. The plates exposed were many, and it is to be hoped the pictures taken will also be many, although, no doubt, the member who was recommended a brick with which to change his plates will develop with a feeling of trepidation as to the results. The weather was perfect for a picnic, but rather too sunny until after tea, but all agreed that it was a distinct success.

Brixton and Clapham Camera Club.—A Special Meeting was held July 6, at which it was decided to hold the Seventh Annual Exhibition the first week in November next. There will be the usual classes for prints or enlargements, and for lantern slides, open to members, and similar classes for beginners; but the Open Class, previously held, will be omitted, it being replaced by an Invitation Class, which, it is hoped, will prove a strong feature of the Exhibition. The Judges' awards in last Members' Quarterly Competition (Landscape) are: bronze medal, Mr. W. H. Stoneman; certificates, Messrs. Ponsford and Bedding.

Gospel Oak Photographic Society.—July 6, at eight p.m., the Vice-President in the chair.—By special request, Mr. Beyer again read his paper on

Lenses: their Property and Uses.

This paper had been read some time previously, but it was thought that a repetition might be of interest to some of the newer members. Mr. Beyer first touched upon elementary optics, and described the various faults that were to be met with in photographic lenses, astigmatism, spherical aberration, chromatic aberration, &c. With regard to the later improvements in lenses, he said that, nothwithstanding all that had been said about them, they would only work well if stopped down, the definition with the larger apertures being good only in one plane. He said that any lens might be used for photographic purposes, whether corrected or not, provided it was stopped down sufficiently. Coming to the subject of the manufacture, he described the method of calculating the curves, rough grinding, polishing, and mounting. He showed specimens of various lenses, and described their special properties and the best method of using them. He also described the use of supplementary lenses for hand cameras of the fixed-focus type. Replying to Mr. Dale, who was the possessor of a portrait lens of the Petzval type, Mr. Beyer

id that this would make a very efficient substitute for an ordinary lantern jective, and was specially adapted for use with an enlarging lantern.

Hackney Photographic Society.—July 6, Dr. Roland Smith in the chair. A paper on *Toning* was to have been given by Mr. Hensler, but was postoned owing to the lengthy discussion which arose in reference to the 12×10 lub camera. The Excursion Secretary gave notice that prints for the monthly mpetition were due on July 20.

Bath Photographic Society.—The excursion arranged for Tintern Abbey id Chepstow Castle took place on Monday, the 28th ult., when about twenty dies and gentlemen availed themselves of the opportunity to photograph the agnificent ruins. The party left Bath at 9 a.m. in a saloon coach, thoughtlly provided for their comfort by Mr. George, the Great Western Railway ation-master. Tintern was reached in due course, when photographic work egan in earnest. Naturally the ruined Abbey received first consideration, ut adjacent scenes were not neglected. Luncheon was served at the Royal eorge, when the President, who led the party, drew attention to the Convention leeting, July 12 to 17, at Great Yarmouth. Leaving Tintern, Chepstow was ext visited, and several photographs were taken within and without the astle precincts.

Bradford Camera Club.—At the weekly meeting on Thursday, July 8, Mr. Iarmsworth presided, and there was a large attendance of members. Mr. F. OWBOURN gave a very instructive lecture, entitled

HINTS ON COPYING.

he lecturer fully explained the process of copying, and gave some very useful ints. At the close there was considerable discussion, and a number of quesions asked, which were answered by the lecturer.

Bradford Photographic Society.—An interesting lecturette on

TRIMMING AND MOUNTING

was given in this Society's rooms on Monday by Mr. PETER ELAND, Mr. Grey occupying the chair. Mr. Eland said it was most extraordinary what an antipathy most amateurs had to using the knife; they evidently wished to always get as much for their money as possible, and therefore left their photographs "raw" or full size, no matter how unsuited that size might be to the particular composition in hand. Composition, by the bye, or the lack of it, was the main reason why trimming was essential. Any one with common sense ought to be able to master the mysteries of technique in a year, and yet, season after season, men troubled themselves about the mechanical side, and it was only when they became grey-headed and had one foot in the grave that they found that a clean, sharp photograph was not the only thing to be desired, and to regret that they had not paid a little more attention to the art. Another reason why we must trim was because of the abominably inartistic size of our plates. To alter these sizes, however, was a thing not to be contemplated—such a revolution in the matters of apparatus would have to take place—and in that way madness and the bankruptcy court would lie. The way out was to trim—quite a simple way out too. The focussing screen should be divided into nine squares, and the pictures composed within these lines, the trimming being done on the print. Long, narrow compositions, continued the lecturer, were the easiest to manage; round ones were the worst, and that was the reason why the general run of magic-lantern shows were distasteful to the artist, the careful operator insisting on all being the same size and circumference, in order that they may register, resulting in the indiscriminate use of the round mask whilly-nilly. Turning to mounting, Mr. Eland said that the best way out of this difficulty was not to mount at all, but to frame close up. If, however, a mount must be employed, a plain, dark-coloured card should be used. For a print 3×5, in his mind, the outside limits of the mount should be at least 10×6. Dark olive or a dark brown would be found to give the best effect, a line being ruled in a quiet red around the print to give relief. A white mount should never be employed, as its whiteness would detract from the luminosity of the sky in the photograph, and destroy the *ensemble* in consequence. Asked by a gentleman what papers he considered the most suitable for artistic purposes, he said he placed carbon undoubtedly first, platinotype next, bromide third, matt P.O.P. fourth, and glossy P.O.P. last of all. Carbon was run close by C.C. platinotype, but the range of colour it allowed brought it past the winning post by a neck. A hearty vote of thanks was accorded Mr. Eland at the close of the discussion.

Sheffield Photographic Society.—July 6, the President (Mr. Tomlinson) occupying the chair.—Mr. T. G. HIBBERT gave a practical demonstration on finishing and mounting prints, both ordinary and stereoscopic, after which the members adjourned to the large room, where were on view two very fine loan collections. The pictures proved most interesting and instructive, and afforded the members an opportunity of seeing specimens of pictorial photography by some of the best workers of the present day.

FORTHCOMING EXHIBITIONS.

1897.		
Sept. 1–Oct. 13	Glasgow International.	W. Goodwin, 3, Lynedoch-street, Glasgow.
„ 27–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
December 9–11	Aintree Photographic Society.	

There will be Open Classes at the above.

Patent News.

THE following applications for Patents were made between June 28 and July 3, 1897:—

PRINTING FRAME.—No. 15,373. "A Photographic Metal Sheath Printing Frame, for Automatically Registering Number of Prints as they are Printed." J. WILKINSON.

STORING NEGATIVES.—No. 15,536. "An Improved Box for Storing Photographic Negatives, particularly Celluloid or other Films." R. G. L. RODD.

PRINTING.—No. 15,671. "A New or Improved Machine for Photographic Printing." J. W. COLLINGS.

FRAMES.—No. 15,689. "Improvements in Metal Frames for Photographs." J. S. RHODES.

CAMERAS.—No. 15,708. "Improvements in or relating to Photographic Cameras." E. O. TOURTIN.

X RAYS.—No. 15,878. "Improvements in or relating to Apparatus for Making Observations by Means of Röntgen or X Rays." Complete specification. J. WERTHEIMER.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE NEW ERA IN LENS CONSTRUCTION.

To the EDITORS.

GENTLEMEN,—Mr. P. Jourdain and I are agreed that the Cooke was not the first of the newer lenses, and by reference to my letter he will see that I have not asserted that Messrs. Taylor, Taylor, & Hobson made that claim. Concerning the pamphlet, I wrote, "Its exclusive eulogy of the Cooke lens would almost lead the reader, unacquainted with photographic optics, to suppose that the greatest improvements in lens construction were their own," and I then made a brief reference to what had been achieved in the past. Under the heading, "The New Era in Photographic Lens Construction," one would expect to find more particulars of the principal inventions than the few guarded words: "The invention of lenses which, with large apertures, form images at once flat, like plates, and sharply defined throughout, marks a new era in photography." This sentence may mean all anastigmatic lenses, but may only suggest the various sorts of Cooke lenses if the reader's mind is led astray by the following sentence: "These improvements are attained in the highest perfection, and by the simplest means, in the Cooke lens here illustrated." A diagram of the Cooke *f*·6·5 is appended. I complain of the omissions, the vague suggestiveness and the comparison of a Cooke with a rapid rectilinear, as proving "unsurpassable excellence," The proof is as complete as though one said, Fifty is more than thirty, and therefore equal to seventy.

As regards the supposed difficulty of adjusting doublets of three components each, Mr. Jourdain's faltering "perhaps" may be appreciated by the light of the following remark of Herr Zechokke, the well-known optician at Messrs. Steinheils'. In an article describing their method of testing lenses, in the *Photographische Correspondenz*, he says, "Faults of workmanship, such as want of sphericity of the lens surfaces and defective centering, are precluded from the outset by our method of manufacture." They are consequently excluded from consideration in his method.

Mr. Jourdain thinks an angle of 64° to 68° more than 67°, and disregards the difference of lens aperture; but the covering capacity of the Goerz lens is 90°, and a 4¾ inch lens will more than cover a 7½×5 plate. Some time ago I wanted a wide-angle lens for a 7½×5 camera, and tried a Cooke lens of 5 inch focus, but it did not cover, and towards the margin there was a want of rectilinearity.

I fully appreciate the qualities of the Cooke lens within a limited angle, but I question its "unsurpassable excellence." Taking Mr. Jourdain's reference to *Photography Annual*, 1896 p. 174, we find that with the Cooke lens slight astigmatism sets in at 10° from the axis and increases slowly up to about 20°, then getting less, so that at a distance of 25° to 26° it disappears, after which it increases again. How will this compare with the following recently published results with a lens of *f*·6·8 aperture, 119 mm. focus

Distance from the normal	0.°	5°	10°	15°	20°	25°	30°	35°
Astigmatic difference	0.	0.	0.	0.	−0·3	−0·5	−0·8	+0·9

Taking the corrected portion of the field, the astigmatism only begins at about the point where it is most in the Cooke, and it disappears at an angle of about 32½° from the normal, after which it increases again. Or, to take another instance, is the Cooke lens equal to the convertible anastigmat *f*·6·3?—I am, yours, &c., P. EVERITT.

88, *Evering-road, London, July* 12, 1897.

WEDGWOOD AND TALBOT: A CORRECTION.

To the EDITORS.

GENTLEMEN,—I have just received the enclosed communication from Mr. E. H. Talbot, of Lacock Abbey, a member of the Bath Photographic Society, for publication through the usual channels open to our proceedings. At this season of the year our meetings are confined to excursions, and, as three months will elapse before the formal meetings indoors can be resumed, I think it expedient, in the interest of

photographic history, to hand Mr. Talbot's communication to you for publication. Thanking you in anticipation, I am, yours &c.,

W. M. ASHMAN.

Hon. Sec. and Treasurer of Bath Photographic Society.
July 10, 1897.

DEAR SIR,—In the late Miss Meteyard's *Life of Wedgwood* she introduced an engraving from a faded photograph representing a breakfast-table scene, which she had persuaded herself was the work of Thomas Wedgwood, in spite of the fact that Wedgwood had placed it on record that he never was able to fix, in any way, the photographs that he obtained by application, and that he never succeeded in obtaining a photograph in the camera at all.

I remember that her assumption gave rise to a good deal of discussion years ago, which must have been at the date of the publication of her book, but I did not see much of the correspondence. I know that my father believed the photograph to be one of his own taking, and stated that he probably still had the negative. I have never actually seen Miss Meteyard's book, but, in December last, I was furnished with a rough sketch of the engraving, which enabled me at once to find and identify with it my father's own photograph. From the facility with which I found this photograph I imagine that it may have been produced in evidence when the matter was under discussion, but I do not know that for a fact. What I think of sufficient importance to be now made public is the fact that, on the 2nd of the present month, I found the original negative, which is not at all likely to have been forthcoming when the matter excited attention. It is in good preservation. I suppose it to be of about the year 1844, but it bears no date. Several of the objects of china, &c., represented, are still in my possession. C. H. TALBOT.

Lacock Abbey, Chippenham, July 8, 1897.

THE CHEAP ENLARGEMENT SCHEME.

To the EDITORS.

GENTLEMEN,—About two months ago the cheap enlargement scheme was started in Bolton by the proprietors of one of the local newspapers.

Accompanying the advertisement of the enlargements in their paper was a letter supposed to be from one of their customers, which contained the following passage: "A pair of similar pictures produced by one of our leading local photographers, a short time ago, cost me three guineas each."

As this was likely to do much harm to the profession, the photographers of the town, including two from the districts, met to consider the matter. At the meeting it was proved beyond doubt that the statement was inaccurate, and it was agreed that the following mild action should be taken: that a letter should be written to the publishers of the paper, signed by each photographer present, asking them to withdraw the statement. This was done, and *their* letter was at once removed. Encouraged by the good attained by our combined efforts, it was resolved that a society should be formed, its object being to protect its members against any action likely to affect their interests, also for the mutual benefit of the members, and consequent strengthening and improvement of their position. This Society has now been formed, the meetings are held once a month, and already the benefit has been felt in many ways, and we are assured that the venture will be successful. I have been instructed by my Committee to communicate this matter with the hope that the idea may be adopted in places where such societies do not exist. —I am, yours, &c., N. S. KAY, *Hon. Secretary.*

55, *Knowsley-street, Bolton, July* 6, 1897.

To the EDITORS.

GENTLEMEN,—In common with many another photographer, I am rather exercised in relation to enclosed.

I have thought the matter over, and am going to try what the following will do.

I am having several young friends photographed, their photographs registered, and then sent to be enlarged by these people—of course the friends will give the orders at my cost—as soon as they get the enlargements, I will take action. Please bring under the notice of the Photographic Union, and see if concerted action cannot be taken in the case of every English paper indulging in this nefarious practice.

I believe we could stamp out this "enlarging pest" in a very short time if what I suggest were generally acted on.—I am, yours, &c.,

The "Continental" Photographic Studios, M. GLOVER.
124, *Stephen's-green, Dublin, July* 7, 1897.

We append the advertisement referred to :—

DON'T MISS THIS.—By sending us a postal order for 6*s.* 6*d.*, you can have a beautiful three-quarter life-size photograph of yourself or a friend. Send us your photograph (no matter what size), and for 6*s.* 6*d.* we will send you an enlarged picture, which, in our opinion, is much superior to those for which artists have hitherto charged from two to three guineas.

DIAMIDORESORCIN.

To the EDITORS.

GENTLEMEN,—With reference to the article which appeared in your valuable paper on the 2nd inst., on the subject of a new developer, "diamidoresorcin," which Messrs. Lumière and Seyewitz recommend as a new developing substance, and which is alleged to possess various advantages over amidol (diamidophenol), I wish to correct the statements made therein.

The application of diamidoresorcin, as well as of triomidophenol, was patented by me before I had discovered amidol in 1891-92, as a developer without alkali, but I have omitted to put this developer on the market, because its properties are far behind those of amidol. Diamidoresorcin keeps in solution with free alkali but a very short time, *i.e.*, not only does it turn yellow within about a quarter of an hour, but it also discolours the gelatine emulsion, and stains the hands and developing dishes.

Stock solutions cannot be made from it at all, because, after a short time, even ½ per cent. solutions will again precipitate the diamidoresorcin, and will decompose even when in closed bottles.

One per cent. solutions, according to the formula of Messrs. Lumière and Seyewitz, cannot be used at all.

The formula given in my patent is of the following composition :—

Water	100 parts.
Diamidoresorcin.....	0·5 „
Sulphite of soda (cryst.)	8 „

I am, yours, &c.,

Stuttgart, July 8, 1897. J. HAUFF.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

Joseph Ramsden, 43, Granby-street, Leicester.—*Painting of a design for Dancer.*

Leonard Varney, Bridge-street, Buckingham.—*Two photographs of John Harper, Esq., Mayor of Buckingham.*

Adolph Lipschitz, 41, Cheetham Hill-road, Manchester.—*Two photographs of Rabbi Joseph Jaffey, from Manchester.*

DRY PLATE.—They make their own plates.

W. A. GENT.—Probably of the Photochrom Company, Cheapside, E.C.

HUGH TAYLOR.—Yes, the phenomenon is not unknown in ordinary pyro development.

VALUE OF JUBILEE NEGATIVE.—AMATEUR. We should say that the two negatives from which the prints sent were made have no commercial value whatever. If they were sharp, and included any of the Royal family, they might have had.

PATENT.—A. J. Before applying for a patent, see the historical collection in the Photographic Section of the Crystal Palace. If we mistake not, we noticed a piece of apparatus that fulfils the same end as yours, though yours may be different in construction.

STAINED NEGATIVES.—W. HARRIS. The method of intensification is right enough. Your failure is due to not sufficiently washing the plate between the different operations. Evidently the hyposulphite from the fixing was not eliminated before the mercury solution was used.

LEGAL.—S. W. A. The matter is too complicated for us to advise upon, and we should not recommend you to do what you suggest without legal assistance. Remember the old proverb, "The man who acts as his own lawyer has a fool for a client." That may prove to be so in your case if you act as you propose.

ROOF OF STUDIO.—LIMEHOUSE. If the putty is all in the same state as the piece enclosed, the best and most economical way of dealing with the roof will be to scrape off all the old putty. Then give to the sash bars a coat, or two coats, of paint, and then apply fresh putty, made with good linseed oil. Another coat of paint will then make the roof water-tight. Nothing less than this will do so, as the old putty seems to have entirely perished and left the glass.

FADED CURTAINS.—R. STONE. We cannot, in this column, give directions for dyeing curtains, even when they are for a photographic studio. If we could, we should not recommend a novice to attempt the work, even if he had the appliances. The best and cheapest in the end will be to send the curtains to a dyer, supposing the material is in such a condition as to be worth dyeing. All materials that have served in a photographic studio for a few years are not always in that condition.

GELATINE PRINTS.—STAINS. The yellowness is clearly due to imperfect fixation. From what you say, the prints reached the tone you desired before they were perfectly fixed. Hence the trouble, which is almost inherent when the combined bath is used and very warm tones are necessary. We are no advocates of any of the combined baths that contain either alum or lead. If you desire warm tones, adopt separate toning and fixing, and thus avoid yellow stains, and secure a greater promise of permanence.

*** Owing to our absence at the Convention, several answers to correspondents and other matters must unavoidably stand over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1942. Vol. XLIV.—JULY 23, 1897.

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EX CATHEDRÂ.

The meeting of the Photographic Convention of the United Kingdom, at Great Yarmouth, last week, acquired considerable distinctiveness, if not distinction, by reason of the circumstance that the Dansac-Chassagne process of colour photography was first publicly demonstrated thereat. It is, we believe, to Sir Henry Trueman Wood that an acknowledgment must be made for bringing this about. Many examples of the process were shown, and a lady from Paris specially attended for the purpose of producing the coloured prints before the eyes of those who were anxious to watch the method of their preparation.

* * *

In common with most other members of the Convention, we very narrowly followed the manipulations of the process. A colourless solution, and three extremely dilute red, green, and blue solutions were employed, and of the latter more concentrated solutions were at hand. The colourless solution and the three dilute colour solutions were several times successively brushed over the surface of the print, and blotted off after each application. The concentrated solutions were then very carefully locally applied. In the case of the portrait of a lady in classical attire, the arms, neck, and face were painted red, and, the superfluous colour having been blotted off, the colour effect was finally built up and completed by means of the plain and dilute colour solutions.

* * *

Writing on this subject some months ago (The British Journal of Photography, February 5, 1897, p. 81) we expressed the opinion that the Dansac-Chassagne process could only be regarded as a not too effective method of colouring photographs. What we saw last week fortifies us in that opinion. We do not believe that selective colour absorption has anything to do with the *rationale* of the process. This theory has all along been advanced on trust. Not one tittle of evidence has been adduced to support it. We believe we are correct in saying that at one of the demonstrations an ordinary piece of white paperwas made to take the colours just as the silver-albumen photograph was made to do. How does selection come in here? In short we are convinced, as was every practical photographer at Yarmouth last week, that the Dansac-Chassagne process is simply a method of harmoniously colouring photographs with which persons of some artistic skill can produce very passable results. Surely, were it otherwise, it would be the easiest thing in the world to prove that selective colour absorption had something to do with the matter. Our faith in the existence of this strange phenomenon received an irrecoverable shock when we saw, last week, the *local* application of colour. Apparently the manipulator does the selection, not the photograph and the colour. It should be noted that, as the demonstrator was unable to understand or speak English, no opportunity was given for putting questions. The last word has not been said on this subject, and, for one thing, we are curious to know the results of the experiments with the process which Captain Abney was said, last February, to have had an opportunity of making.

* * *

It was expected that Mr. Bennetto would have sent some of his most recent productions in colour to the Convention, but they were not forthcoming. Examples of the Joly process were looked for; but here too disappointment was experienced, as the method has, so far, only been employed for photographing the spectrum. Some comments having been made

with reference to the transparencies in colours shown us by Mr. William Brooks a few months ago, we may here say that Mr. Brooks has the subject in hand, and will probably make a further communication upon it at a future date.

* * *

At occasional intervals during the last twelve months we have criticised an association styled the Institute of Photographic Artists, and, after analysing all the documents connected with the scheme, we have allowed it to be understood that we do not recommend our readers to apply for membership of the Institute. Our many references to the matter intensifies the surprise with which we regard the following question that has reached us: "Can you give me any information regarding the Institute of Photographic Artists? I am desirous of knowing the necessary conditions of membership, whether it is necessary to be proposed and seconded before one can become an Associate, and the annual subscription, also the nature of the society, and the name and address of the Secretary." Our correspondent must refer to the files of the Journal for the information he seeks. We are of opinion that, after the publicity we have given to the nature of the Institute of Photographic Artists, the professional photographer who has to admit ignorance on the subject sacrifices the smallest claim to the consideration asked for in the above letter.

* * *

We are pleased to read, in the last number of the Camera Club journal, that Mr. J. Wallace Godfrey, M.A., has been appointed Honorary Secretary of the Club—a fact, it is added, on which the members should be congratulated. Mr. Godfrey's name has recently been prominent in the pages of the Club journal, his scheme for financing the Club having been adopted at the last general meeting.

* * *

The Camera Club has made an extremely wise choice in this appointment, and we believe that Mr. Godfrey, who has the highest qualifications for the position, will speedily demonstrate his power of successfully filling it.

* * *

The Woodbury Permanent Photographic Printing Company, ask us to note that they have removed their works from Ealing, where they have been located for nearly twenty-five years, and have outgrown, to new premises which they have erected, fitted with all the most modern appliances calculated to turn out their various kinds of printing and enlarging. The new premises are situated at Downs Park-road, Hackney, N.E.

* * *

We understand the recent issue of 40,000*l.* preference shares of Ross, Limited, Opticians—late Ross & Co.—was over-applied for, and has been allotted in full. No ordinary shares were offered to the public, the entire issue of 60,000*l.* being taken by the vendor. The balance of 20,000*l.* of the authorised capital of 120,000*l.* is reserved for future issue when required.

THE SWING BACK.

In two previous articles we have dealt with the distortion produced in the camera image by tilting the instrument and by the use of the swing back respectively, and have shown that, while either movement alone modifies not only the shape, but also the proportion of the figure, the two, when employed in conjunction, exactly neutralise the distortion produced by either singly. In other words, if it be necessary to tilt the camera in order to bring the upper portions of a lofty building on to the plate, by swinging the back into a vertical position the perpendicular lines of the subject are restored to their correct condition without any interference with the proper proportions of the picture.

We intend now to direct attention to the question of the possibility of correcting the distortion already existing in a picture taken with a tilted camera by utilising the principle of the swing back in the after-process of copying or enlarging. It is tolerably well known that, if a picture presenting the defect of converging perpendiculars be copied in a sloping position instead of in a vertical one, the defective lines are restored to their proper form, and there, so far as a large majority of photographers are concerned, the matter ends, and the resulting picture is considered to be correct in all respects. That a good deal of misconception exists on the subject is proved by the discussion that took place at the Camera Club Conference on Professor Allen's paper, and which induced us to take the subject up.

Professor Allen, in dealing with the question of correcting the perpendiculars in the process of copying, recommended that both the picture to be reproduced, as well as the sensitive surface, be sloped or inclined in opposite directions; but, according to the report, if we remember rightly, this was objected to by those present, some of whom held that the subject to be copied should be inclined, while others preferred to apply that process to the sensitive surface.

We have not the details of the discussion by us, so cannot refer to the arguments deduced on either side; but it is very evident, from what we have shown in previous articles, that, while the supporters of sloping the pictures to be copied are palpably and egregiously wrong, those who take the other view are so only in less degree, and that Professor Allen is, after all, correct, though, so far as we are aware at present, there is no ready means available by which *absolute* accuracy can be assured, even by his method, though it is only by that method—dividing the inclination between the original and the copy—that perpendicular lines and correct proportions, or, in other words, absolute freedom from distortion, can be secured.

It will be remembered that we showed that, in tilting the camera, not only are the perpendicular lines made to converge, but the height of the object is reduced, and a building or other object becomes dwarfed. Now, tilting the camera is tantamount to inclining the object, since, while the axis of the lens remains perpendicular to the plate, the parallelism between plate and subject is departed from, and the effect is precisely the same as if the subject were inclined. If, then, we take a photograph that already has undergone the dwarfing effect of tilting, and subject it a second time to the same action by inclining it to the camera, although we may restore the parallelism of the upright lines, we still further reduce the apparent height of the subject, the error in proportions is, in fact, more than doubled.

But, as we have also shown in our previous article, by swinging the back of the camera, or, in other words, inclining the sensitive surface or copy, we increase the height of the subject, from which it would appear that this is the proper course to pursue. Of the two, if choice were limited to these, it would be, since it operates in the contrary direction, to the original error, instead of intensifying it; and, if the operation

of inclining the back acted similarly or equally in correcting the two forms of distortion, which we have here called "horizontal" and "vertical," it would be absolutely correct, but such is not the case.

If we photograph the chessboard diagram referred to in our last article, with the camera tilted, noting the angle at which it is placed, and then copy the result, with the swing back placed at the same angle from the perpendicular, the result will probably be a surprise for many of our readers, for the perpendicularity of the upright lines will be far from restored. We have not accurately measured the respective angles, but roughly we should say that at least double the swing is required to restore the lines to their vertical position. Why this should be so, or why, in the case of using the swing back in the ordinary way, no distortion is produced, are questions we cannot enter into here; but such is the fact, and it results from it that even inclining the copy does not secure freedom from distortion. If we go on increasing the swing until the upright lines become parallel on the ground glass, it will be found that the height of the diagram, as compared with its width, has been materially increased, though to nothing like the extent of the *decrease* that would occur if the diagram itself had been inclined.

In an experiment made for the purposes of this article with a diagram composed of sixty-four squares, each four inches, or a "chess board" thirty-two inches square, a reduced photograph was made to one-eighth the original dimensions, plate and diagram being strictly parallel. The chessboard was consequently four inches square in the reproduction, and the individual squares half an inch. A second reproduction was made with the camera tilted at an angle of $12\frac{1}{2}^{\circ}$ from the table, the diagram being raised until it occupied the centre of the plate, and the camera adjusted in distance until the centre horizontal line measured just four inches, this being the line that suffers practically no distortion. In the resulting copy the centre vertical line measured as nearly as possible three inches and seven-eighths—the figure had, in fact, been "squeezed down" to the extent of an eighth of an inch, or slightly more.

This distorted copy was now made the *corpus vile*, and, in restoring the uprights to their vertical position by sloping the diagram, the height of the centre line was further reduced to three inches and three-eighths, or a departure from correct dimensions of nearly one-sixth. When the sensitive plate was inclined, for which purpose the swing back of the camera had to be "unshipped" and held in position by temporary means, the height of the centre line, or of the figure, was increased to four inches and one-eighth, or one thirty-second of above the proper measurement. These measurements are, of course, not made with a micrometer, but are sufficiently accurate to show the effect of the various movements.

Obviously, then, the inclination of neither subject nor copy alone results in accuracy, that quality being only attainable by the method mentioned by Professor Allen of inclining both, a plan, by the way, which we ourselves put forward some two years ago; but then the difficulty arises of how to apportion the inclination so as to secure absolute accuracy, and, so far as we are aware at present, no ready means exists by which this can be arrived at. That absolute correctness of rendering can be obtained, we satisfied ourselves with the distorted "chess board" above referred to, but the result was arrived at in a tentative fashion by repeated changes of adjustment; and the rough measurements we made of the various angles in no way help us to the establishment of a rule by which the smaller could be arrived at by calculation.

It seems improbable that any universal rule would hold good, since, to mention only once circumstance, the relative degrees of inclination would vary for the same picture with lenses of different foci. In one of our articles of two years ago we gave a rough rule for arriving at the result, but we doubt whether it would be found universally applicable, and, if we remember rightly, it was based upon the measurement of the angle of the distorted lines, or the difference between the top and bottom dimensions of the object. But, though these might be measured with sufficient accuracy for practical purposes, they would give no sort of idea of the degree of vertical distortion, which would be practically left to guesswork. Probably a few practical trials upon such a diagram as we have used would enable each operator to establish an empirical formula for his own use, but beyond that at present we fear it is impossible to go unless some of our mathematical readers can help us.

In conclusion, we trust we may have thrown some little light on the swing-back question, at any rate for some of our readers. At the same time we would venture to ask the question whether, given a satisfactory formula for calculating or arriving at the degree of inclination to give to subject and copy, the absolutely best results would not be obtainable in this manner rather than by the employment of the swing back on the spot? We are quite aware the subject is a debatable one, and we may return to it at no distant date.

To Blacken Wood.—M. Koninck suggests the following method of blackening wood, which has the advantage of resisting acids and alkalies.

A.

Cupric chloride	75 parts.
Sodium chlorate	67 „
Water	1000 „

B.

Aniline hydrochlorate	150 parts.
Water	1000 „

Paint the wood with A and a short time after with B, and remove with a damp cloth the yellow powder that forms. Repeat this operation every day till the desired colour is obtained, and then rub the wood with vaseline or linseed oil. By using potassium bichromate instead of the soda salt a good black colour is obtained at once.

The British Association.—Every arrangement to ensure the ease and comfort of the members seems to be in progress in Canada, so as to obtain, as far as possible, a success in the personal aspect of the meeting. That great bugbear of travellers, the examination of luggage, is to be made in as light, we will not say perfunctory, a manner as possible. The Minister of Commerce has given special instructions to the Custom-house officials at Quebec, Montreal, and Niagara, to facilitate in every way the examination. Then, again, each steamer from Montreal to Quebec will have an examiner on board, so as to avoid all delay. Photographic dealers and makers will, no doubt, be on the alert for all scientific apparatus marked "For British Association." Still another valuable concession has been made by the cable companies, who will send free two messages for every member of the Association desiring it, and will also frank two reply messages to the same.

Colouring Glass by Surface-staining.—Over the signature of A. F. Gall, in *La Nature*, last week, appears an article dealing with this subject on the basis of a new principle. Up to the present time, he states, the method employed for staining glass consists in adding a metallic oxide to the glass, and melting together the whole mass. M. Gall colours his glass on the surface without melting; he simply impregnates the glass with the colouring, then applying to a piece of glass some silver salt, and placing it in a furnace at a temperature of from 500° to 550°. After a time, when it is cooled down and the free surface salt removed, the glass will be found stained yellow. According to the composition of the glass the stain may vary from pale yellow through orange to red. A very slight quantity of silver salt only is needed, then a piece of lace dipped into a one-tenth purest solution of nitrate of silver, and afterwards into one of sulphide of potassium, placed on a piece of glass and heated, leaves an imprint of deep yellow. The intensity of colour is dependent upon the strength of the silver salt applied, and the depth of penetration upon the time of "cooking." If our remarks have been followed, it will be seen that their natural sequence is to suggest the photographic application of the process, and, according to M. Gall, a photographic negative upon glass gives, after baking, a beautiful red tint, leaving a beautiful effect by reflected light, but being invisible upon looking through the glass. Similarly is glass penetrated by gold, copper, or iron. The writer concludes by saying he has seen a piece of lace or of embroidery, a portrait, printed direct upon glass in less than ten minutes.

Röntgen Rays and the Skin.—The subject of the action of the rays upon the skin still continues to excite interest and discussion, and quite recently M. D'Arsonval brought before the Paris Academy of Sciences a case in which acute dermatitis had been produced by two exposures only, of forty and of ninety minutes. After the first exposure, the abdominal wall being the part treated, great nausea was produced; after the second the inflammation set in, vesicles were produced, and a discharge set up, the surface sloughed, and severe pain was experienced. This went on from May to October, notwithstanding medical treatment, till the effect of oxygen was tried. Some benefit was experienced, but it was not till electric baths were tried in June that a cure was effected in every other case after six weeks' experience of them twice a week.

Röntgen Rays and the Retina.—M. Guy Oliver Harrison writes to *Nature* last week, describing his experience with the rays upon the retina. He finds that, after resting the eyes in the dark for about ten minutes, to get rid of previous light excitation, he is quite able to see, if the expression may be used, the light from these rays. He places a focus tube immediately beneath a table top one inch thick, and, after exciting the tube, places his eye close to the table immediately above the tube. He says, "I could perceive a faint illumination of the retina, and, upon moving small metal objects to and fro immediately in front of the eye, I could see their shadows on the retina, appearing always to move in the opposite direction. On moving the eye further away from the object, the shadow enlarged. It is possible to make out the shape of small letters, about a quarter of an inch long, cut out in the middle of a sheet of lead, if they are placed close to the eye, whether open or shut does not matter."

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

GREAT YARMOUTH MEETING, 1897.

TUESDAY EVENING, JULY 13.

In resuming our report of last week's Convention proceedings, we subjoin the paper by Mr. Horsley Hinton to which we then made reference. The President (Mr. F. P. Cembrano) occupied the chair.

METHODS OF CONTROL, AND THEIR INFLUENCE ON THE DEVELOPMENT OF ARTISTIC PHOTOGRAPHY.

By A. HORSLEY HINTON.

UNLESS I am mistaken, papers professedly dealing with what is, rightly or wrongly, termed the *art* side of photography have not hitherto very prominently figured in the Convention programme, and, when I found myself honoured by an invitation to prepare and read a paper for the present occasion, I regarded it as yet one more recognition in high places of the growing popularity with which this particular side of photography is regarded.

I do not think any one who has an opportunity of seeing the description of work produced by all sorts of workers, young and old, professional and amateur, in towns or in the country, can fail to note that, whatever the result obtained, with the greater number of those who practise photography *the intention and aim* at least is to produce a *picture* rather than to demonstrate the characteristics of the process. Such a conclusion, too, is borne out by the fact that at every important Exhibition the character of the works sent in necessitates by far the greater proportion of space being allotted to the perhaps not too accurately styled "art section."

This might be taken as sufficient reason for a paper being read at so important a gathering as the Convention on this eminently popular pictorial aspect of photography, but that I was led to believe (though this again may be a misapprehension) that those who attend this great annual congress are chiefly those who are mainly concerned in the physical and experimental phase and those who, by their researches or their manufactures, supply the material wherewithal, and the knowledge essential for the production of the photograph of whatsoever initial motive.

Then, yet another possible delusion of mine is that Convention papers are by no means chiefly meant for the edification of Conventioners. I have been myself to the Photographic Convention before this year, but I frankly confess I never found my way to a paper reading in time, and singularly few of my fellows were able to tell me anything about the papers afterwards until they appeared in print, so I concluded that these papers are supposed to be annual contributions to the general fund of photographic knowledge and thought drawn from certain well-disposed and easily beguiled persons by a philanthropic secretary, to the end that, being gratuitously offered to the press, they may be distributed amongst thousands of readers throughout the world, and prevent their saying that we meet only for frivolous enjoyment.

This idea being present with me should, whether erroneous or not, secure for me your indulgence, if what I have to say seems to appeal more to the general average of photographers than to the distinguished company in whose hearing it is read—a company which including those who, by enjoying at the present moment the sea breezes on the marine parade, show their keen power of discriminating between good and bad, or at least between a greater and lesser good—a company largely composed of those but for whose splendid services in the fields of science and mechanics neither I nor any who practise photography with the same end in view would ever have been able to use photography at all.

Now, if I were only required to state my case to those present here, their knowledge of contemporary photographic art (I use the term in a loose and general sense) would render it unnecessary for me to say more than this, namely, that I, in common with some others, have for long maintained that the man employing photographic means for the production of a picture is free to take whatsoever liberties he chooses, with the performance of his tools and materials, and, indeed, is justified in calling in any auxiliary means if by so doing he can better fulfil his intention; and, inasmuch as the chief means employed is photography (and no well-conditioned alternative term has been suggested), we may not hastily refuse him the use of the term photograph to describe his works, always and of course provided that he does not dishonestly produce them as examples of pure photographic process. But, bearing in mind a possible larger number of hearers or readers, I want to show reason for suggesting that some auxiliary means for picture production has always been sought for, and that such auxiliaries merely constitute the exercise of control over the formation of the photographic image; that only when such control is exercised is photography anything but the most mechanical of crafts; that the more freely such control is used and auxiliary means introduced the more possible does it seem that in photography, at present so questionable as an art, we may one day have a perfected means of artistic expression especially adapted to the requirements of its time. But—and here I might especially appeal to those here present (and others outside whom we shall meet with anon)—those who are concerned in teaching and

ating others and on whom devolves the office of conferring rds and distinctions, and thus encouraging any particular work—e on whom such responsibility falls need to be placed on their rd lest, in encouraging unduly the pretty and pleasing work in ch photography has been largely assisted or controlled, liberty s place to licence and in control uncontrolled those very qualities photography which may be usefully employed are gradually lost it of, and good photography die in our midst, too cold and lected to engender a new life from its ashes.

would seek to secure the admission that personal control to the ent of employing auxiliary means is essential if photography is to ome a means of pictorial or artistic expression, and so I would l a justification for such practices; then I would utter a caution , after recognising the inefficiency of photography, we allow it to enerate, and I would try to point to the weak places where ener- ion and degeneration may creep in and rob of its individuality and inctiveness as a possible artistic method of which as yet we are y witnessing the dawn.

his matter touches very vitally, if indirectly, the interests of ry one connected with photography in whatsover capacity.

The slowness and difficulty of manipulation of the wet-collodion te was as much a hindrance to the pictorial worker as to any other, l the chemist came to our help. The incorrect rendering of colour ues of the unorthochromatised plate was a defect, an inefficiency ich the landscape-picture maker resented as greatly as did he who ied coloured models. But that uncorrected plate was the pure l perfect photography of its day, and, in introducing coloured eens and plates specially prepared to make those screens more cacious, we did but seek to exercise a measure of control towards a en end.

Many such instances, having reference to the modification of paratus as well as of materials, must in the time at my disposal cessarily be omitted in the progressive chain of links forged by e combined requirements of the picture-maker and the skill or owledge of the scientist, until we come to consider the use of the ncil as an assistance in modifying the negative image. It was the *use* of retouching which brought it into discredit and led the otographic Society to constitute it a disqualification at its Exhibi- ons, an illogical act of itself if the mere pictorial effect of the work as its *raison-d'être*, but, as results have shown, a very laudable one the end, for, whilst it may have restrained the unbridled use of the touching pencil in incompetent hands, it may also have made the er more careful not to let the pencil overstep the duties of an xiliary and a subordinate, in short, made him careful not to be und out in its use.

Now, I do not think it were straining the argument too far to say at, but for the weaknesses or imperfections in the photographic ocess, markings, due to bubbles in the developer, pinholes, ex- essive hardness and transparency in the negative shadows, and so rth, would never occur. To put it more safely, were the process ill further simplified and improved, it would not be possible for us let such defects occur; but, as the process does permit of the possi- ility of making these mistakes, subsequent auxiliaries, such as opaque otting, matt varnish, and other tricks, become essential, and are herefore justifiable.

As another example, bringing me nearer to my principal point, I ould instance intensification and reduction by means of chemical lutions, and especially local intensification and local reduction. Whether we locally intensify or reduce in order to make the final sults more like nature or in order to produce the effect our fancy ictates, we must, I think, speak of the performance as exercising eliberate control over the unaided photographic result.

Again, is not the use of retouching, as we call it, a tacit recog- ition either of photography's natural inefficiency or else of the articular operator's inability to obtain what he wants by purely hotographic means? Now please notice that from the particular tandpoint which, on the present occasion and for the sake of my resent argument, I have taken, the admission of alien methods is qually justified whether we agree that it is the natural imperfection f the process as we at present know it, or the absence of skill in he operator, because the conception and realisation of a picture is n entirely personal matter, and whether the pure photographic endering is or is not the best untouched is a matter for the indi- idual producer to decide for himself. Because one man can accomplish certain thing purely by recognised photographic means, it is not ncumbent upon another to accomplish his end by similar means, or even is he to be reckoned less successful or less able if he achieve he same certain thing by less purely photographic means. I must laim this individual liberty for all pictorial workers, otherwise the ealisation of each man's artistic aim becomes but *an exhibition of comparative skill* in using certain prescribed instruments and media. It is but a very proper instance of an end justifying the means.

Remember, please, that I am speaking of pictures, or what are intended as pictures, not examples of photography or of any other process. If, for the sake of example, two men set themselves the task of rendering a certain poetic phase of nature, so as to suggest to the spectator some of the feeling which the original condition suggested, or, in other words, if two men set themselves the task of rendering a certain phase of nature artistically, and both elect to avail themselves of whatever advantages they deem photography to be possessed of, it matters not at what stage in the work each exerts some special control over the photographic procedure, or when he introduces some alien means, or how much of such means he calls into his service. The result obtained by each is, as a picture, judged quite apart from the means of its production, and if the artistic ability of these two workers are compared (a very wrong and foolish thing to do, they are compared and judged by the result achieved, their productions are not regarded as exhibitions of skill in wielding a certain machine.

This is somewhat of a digression from my principal theme.

Now, I have instanced certain common practices for modifying the simple mechanical photographic image, and have suggested that they are methods of alteration or control which few photographers would hesitate to justify, and the same might be said of such "dodges" and "tricks" as using mineral paper on the back of the negative, or printing in one portion and covering over another, and finally "sunning down" the finished print.

It may be argued that with "spotting," "retouching," and intensification and reduction we have merely methods for correcting technical defects due to our own clumsiness or neglect; and, even if this be granted, I think, whilst I do not propose to put this more fully before you, you may reflect for yourselves that the passage from such methods, the purpose of which is to remove a defect, to methods which have for their purpose the introduction of something is one so natural that it were difficult to draw a line anywhere and say, This is legitimate, but that is not.

It has been said that those methods are legitimate which destroy or leave out, such as retouching, masking out skies, &c., whilst those methods are not permissible which introduce some new feature. I should, however, like to point out that, if we admit "sunning down," to take only one instance, the *destruction* of a glaring high light is equally the *construction* of a shadow or a lower tone. To keep a shadow from printing deeply by covering a portion with paper we destroy an over-deep shadow, but at the same time we are creating a lighter tone which was not in our negative, and possibly was not even in nature.

There are those that hold—I have held and taught the same myself from insufficient thought—that we may suppress, but not add anything which our negative gives; but, as it now seems to me that, as regards the methods to which I have already made reference, the act which suppresses simultaneously introduces. Is retouching destructive or constructive, does it *destroy* a line or a shadow, or does it *construct* a lighter tone in an under-exposed or badly illuminated shadow. In like manner, if printing-in is constructive, making a darker portion, to that part which a while you cover up to let the other gain strength, it is relatively destructive. Do we "sun" a print down to introduce shade or to destroy a high light?

I will not continue longer in this strain, as I desire these remarks of mine to be suggestive rather than an attempt at a conclusive argument.

I would only ask if we have any right to condemn this or that attempt at a pictorial realisation of an idea or of some phase of nature (to do which the distinctive qualities of the photograph have been employed as far as those qualities will yield to the will, or as far as the particular operator is able to apply them)—I would ask, Are we to condemn the result which is otherwise satisfactory because we find the photographer has sacrificed some of the cherished attributes of the process, or because we happen to know, or from expert scientific knowledge discover, he has called in the aid of some foreign means or appliance when pure photography failed him?

I say with intention, and I repeat, "happen to know, or from expert knowledge discover," because the illegitimacy of an alien method is proclaimed, and the limitation of methods of control is reached WHEN THE MEANS BY WHICH ANY EFFECT IS OBTAINED IS SELF-EVIDENT. So soon as, whether by painting, or pencilling, or masking, or any other contrivance, error in form, falsity of tone, variation in texture, or any other violation of what the educated eye looks for as a true interpretation of nature becomes visible, then we may justly condemn the manner of its doing, but the principle which admitted it is not affected. Again, when from want of knowledge,

lack of judgment, or sheer carelessness, it is, without expert scientific knowledge, apparent that brush, or pencil, or other means, has been employed, and incongruity of the whole is visible, then the auxiliary has become the chief, and the governing.

I would emphasise this because it answers the objection to retouching when it is unintelligently used, and destroys true tonality and correct drawing. By the same it condemns painting on the print to any but a very limited extent, if indeed it needs to be used at all, because the hand work is detected, and thus the whole is not homogeneous, the means employed are self-proclaimed; also with combination printing, and even with such a simple thing as sunning down, it is bad when badly done; it is badly done when it is self-evident.

I know the photographic expert who will speak in terms of admiration of a photographically obtained picture, but tell him it is not just exactly what its negative would yield in the hands of another and his estimation falls at once. He admired it as an example of photography. Now, I have nothing to say against such a one, if he will but let me admire it as a picture.

If a man sees a volume by Thackeray, and looks forward to a pleasant time for reading, only to discover that some scientific treatise has been bound up in a cast-off cover of *Vanity Fair*, I only blame the person who did not obliterate the old title on the back, as I should blame the person who exhibited a photograph produced after much "faking" as a specimen of pure photography.

Pictorial photography is fast becoming as objectionable a term as artistic or art photography, because almost as hackneyed; but, until a better word is suggested, if we accept it as meaning a serious attempt to produce a picture, using photography under control and modification, we should all perhaps be the happier, and much rending of each other's feelings be spared.

And now, for the pacification of some, may I say that the use of paint on the negative or any such extreme method, so liable to be indiscreetly used, need not be resorted to, still less so on the print?

With some considerable temerity, I ask your attention to some prints here which may roughly indicate some of the control which may be exercised merely by "sunning down," by "printing in," and "keeping back." I am free from claiming success for either of the finished prints, because I, knowing well their faults, show them only as examples along with direct uncontrolled prints from their respective negatives.

It might be expected that in this connexion I should make mention of such a method of printing as what is known as the gum-bichromate process, in which a power to control the final result is carried to a maximum degree. In this process, as you know, either by directing a stream of water or by painting on the partially developed print with a brush, variations in light and shade can be made to almost any extent, objectionable forms can be eliminated, and even new forms introduced; but, for my own part, I do not yet feel sure whether the exercise of this power is not accompanied with too great a sacrifice of some qualities of the typical photographic image which, as yet, I am so conservative as to cling to and fear to lose. I am afraid that in this great freedom to alter the mechanically produced image very few will succeed to do anything but shock us with strange caricatures and enormities. Some there are, and these same few, if they can paint with water on the gum and bichromate surface, could as well paint on paper with pigment in time-honoured fashion, and save much messing and vexation.

I believe that, by stopping printing, and by toning down and arresting printing where required, light alone may be made to be far more obedient than we think. I especially want to free myself from the charge of advocating "touching up," as we understand the term, and as we see it practised. It is one of the things most abhorrent to me. And now, very briefly, as to *why* we should not be content with the automatically produced image. Why should interference and control be necessary?

Let me ask any photographer who can also also paint if he can frankly say of any pure photograph that it is exactly as he would have it had he painted it. Even supposing, by careful choice of subject, we have secured perfect composition, we have then merely the grammar without fine language, merely the rhyme and metre without the poetry.

It should not be necessary for me to here remind you that nature is one thing and art another. A facsimile and a picture are very different matters.

But the strong point, the essential character of photography, is its literalness.

This predominant quality in photography is not only not required, but is even *in a measure* antagonistic to an artistic rendering. I forget who it is that has described golf as the putting of little bal into little holes with instruments particularly unfitted for the purpos but I have thought that perhaps some of us are in no better pligh than the golfer—we strive to express our impressions artistically with a process particularly unfitted for our purpose.

Art is personal, individual, and everything personal must o necessity possess emphasis. Consciously or unconsciously, ever individual, in thought, or word, or act, places emphasis on the which affects him most, according to personal bias and inclinatio but the lens and the plate know no emphasis, all is treated equall and without preference. It is in order to break down th literalness, and to emphasise some idea, some part, some effec that I require some method of control, and the necessity for i justifies its use.

Let it be understood that I am not asking that every picture be o a dramatic, striking character. There are pleasing effects on th quietly lighted grey day, as well as under a riven storm cloud, an it may be that it is the very quietness and greyness which it i necessary to emphasise. I would go so far as to say that, if th first hastily made proof from my negative pleased me entirely instead of congratulating myself on so lucky an achievement, should at once suspect my own taste and judgment of being blinded by the pleasing arrangement of parts, the exquisite rendering o tones, or some such quality. The very fact that the photograph however beautiful, however at first sight satisfactory, is made by a machine incapable of emphasis, incapable of feeling preferences, o of expressing personal bias, makes it, unaided, the most mechanica of crafts, and only a possible artistic means when powerfully controlled.

A fortunate chance of lighting, a happy composition may have been taken advantage of in making the negative; *but, then, of these two conditions my photograph gives me but a literal rendering*, therefore my photograph must be inartistic. *Its very literalness is its undoing.*

But one may say emphasis may be given by differentiation of focus and effect of light and shade accentuated by suppression of focus altogether, which course of action, by your leave, I should claim as a method of control considered by some as great a heresy as any other, whilst local development too often, as far as I have been able to observe, controls the would-be controller.

I believe many of you will follow me when I say that again and again we meet with fine examples of photography in which there is every evidence of taste, judgment, skill, and we know their producers by name, and have seen from their hands equally good work year by year for many years past. They have gone as far as photography will go in the present state of knowledge, but they have not thought to call in a large amount of personal control, by which they would impart at once a personal and individual character to the result, for, because such act of control is not mechanical, it varies in power and truthfulness, and makes it possible for every work to outstrip its predecessor. That the exercise of such control requires no small degree of artistic instinct may be admitted, and accounts for the fact that some not so gifted never get far beyond the production of very fine work, such as they learnt how to make after their first six months of practice.

Ladies and gentlemen, I am painfully conscious that, in seeking to justify what has been called "photo-faking," I am like one who sets free a virulent germ, which may easy spread destruction and disease in photographic ranks. I would therefore beseech all those who have it in their power to render this germ innocuous by stimulating and encouraging good pure photography whenever they meet with it.

I think I am right in saying that there are some disease germs which, taken in and comfortably provided for by a good sound constitution, produce vigorous growth, but do not kill. So give us all, please, a fine, vigorous photographic constitution, but watch over and occasionally give corrective medicine to the weak whom my germ might destroy.

Not too much germs, but just germs enough, not too much control, but just control enough, in the right hands, will do photography as a whole much good.

I hope what I have been saying will be taken only as suggestive to those whom it may concern, and, whilst I think it is hardly likely any discussion will follow, I trust each speaker will first provide for himself an antagonist, and with some one prepared to answer his objections and questions.

I have done my share, and more than my share, of speaking, and would fain leave the rest to others, albeit I would endeavour, if required to make good any imperfection of expression of which I may have been guilty with the same courtesy which you have kindly extended to me in your attentive audience.

drew Pringle said he had listened to the paper with great
As to the legitimacy of "faking," he was of opinion tha t
fake away as much as one liked, but that it was a mistake
e results photographs. To the general public it probably
matter whether one "faked," more or less, as the public
pon such a result as a picture or an attempt at a picture.
neans let the public accept it as such; but the case was
with photographers, with whom, however legitimate faking
e, it was not advisable except to a limited extent. He
that Judges at Exhibitions should notice "faking" un-
ly, for the reason that, if they were stern, it would constrain
, opticians, and others to improve their productions, to the
vance of photography. He believed that there was no harm
l retouching, provided it was not overdone. Disfigurements
oe removed, but he objected to the "suet-pudding" method
ching as preposterous, objectionable, and false.
'. Fall said that it was usually refined people who insisted
suet-pudding" retouching. The speaker then subjected
hotographs that Mr. Hinton showed for the purpose of
ing his paper to considerable adverse criticism, a point
Mr. Hinton took up in his reply to the discussion by remark-
it Mr. Fall had discovered six pictures on the platform,
s there were admittedly only two, the other four being shown
ples of the effects obtained by sunning down, &c. Mr. Hinton
that he found himself in harmony with Mr. Pringle in the
tions he had made.
President, in closing the discussion and moving a vote of
to Mr. Hinton for his paper, remarked that the end justified
ans in aiming at certain results.
F. Bishop then gave the following address on copyright.

PHOTOGRAPHIC COPYRIGHT.

By Frank Bishop.

E been invited by the Convention to read a paper on photo-
c copyright, and I have been induced by my interest in the
t, and my connexion with the Photographic Copyright Union,
sent. I must trust to your kind indulgence, for I have had
ittle experience either in making speeches or reading papers.
ld be presumptuous on my part to attempt to clear up disputed
points on the subject of copyright. I will simply call your
ion to the recognised definitions, and give you some of the
ences of the Photographic Copyright Union, which may be
l to photographers.
e following may be considered as a digest of the important
es (Acts of 1862 and 1886) which concern copyright in photo-
s:—
Any person (a British subject or one residing in the dominions
e Crown) taking a photograph of a person, place, or thing, for
h he does not receive valuable consideration (this is commonly
stood to mean payment), the copyright of such a photograph
gs to him (*i.e.*, the photographer).
Any photograph taken by a photographer for another person,
pays (or gives valuable consideration) for the same, then the
ght belongs to that person.
Yet a photograph taken by a photographer for another person
pays may, by a special agreement in writing, become the
grapher's copyright. This is called the assignment of the
ght.
English photographers have copyright rights accorded to them
foreign countries which joined the Berne Convention—viz., in
e, Germany, Belgium, Spain, Italy, Switzerland, Republic of
, Liberia, and Tunis. If the copyright be valid in England, it
lso be valid in the States of the Berne Convention, and pro-
n will be accorded the same as to natives of the said States.
ill be observed that the United States of America is un-
nately not included in the above list. English photographers
copyright rights in the colonies, but depending on colonial
which I have had no opportunity to study, and therefore can
no definite information.
To enforce the copyright in a court of law, it must be registered.
The duration of a copyright is for a person's lifetime and for
years after his death.
e above clauses seem simple, but in practice various difficulties
and, according to the experience of the Photographic Copy-
Union, they occur mostly from want of precision and establish-
he facts in writing.

If free sittings are to be given for and on behalf of the photographer, the fact should be recorded in writing.

The Photographic Copyright Union lays special stress on the wisdom of registering every photograph which may be of copyright value at the time of production. However, it should be noted that the registration may be effected at any time.

The Secretary of the Photographic Copyright Union undertakes to register photographs for any member, and to give instructions how to fill up the forms. In cases of assignment of copyright, the Photographic Copyright Union supplies members with suitable forms. I may add, as a personal opinion, that assignment of copyright might be made much more use of than it is, that provincial photographers might easily get a collection of local celebrities under these conditions.

I will now say a few words as to the Photographic Copyright Union, how it came to be formed, and the need for its existence. Some years ago portraits of celebrities were always produced either in silver or carbon prints, the photographer possessed the negatives and produced the prints, and the trade was well in his own hands. It is repeating a well-known fact, the vast improvements made in process work (what is known as the half-tone process) arrived to such a degree of perfection that it became extensively used in illustrated magazines and other ways, supplanting in a great measure the artist and the wood-engraver, and also supplanting most unfilially its own parent, the silver print. Some idea of its powers may be judged when I tell you of my own experience as a member of the firm of Marion & Co. The department specially devoted to the publication of celebrities in *cartes-de-visite* and cabinets silver prints has been closed; at one time the stock could be counted by hundreds of thousands, the sales annually by millions; that trade has been pretty well exterminated by half-tone reproduction. The leading London portrait photographers saw the formerly extensive trade in publications going from them, and their works reproduced, without payment, in all sorts of ways. By the exertions of Mr. Joseph Elliott, Mr. W. E. Downey, and Mr. Alfred Ellis and others, the Photographic Copyright Union was established. Its objects were to establish a rule that no copyright photograph should be reproduced without payment of a fee and to help to protect members against infringement of their rights.

How far they have succeeded is pretty generally known. Besides professional photographers, they also hold out the hand of welcome to amateurs. There seems no reason why the clever and artistic productions of the amateur should be given away more than those of the professional. Photographers from all parts of the British Empire appeal to us, become members, and get help.

There is just one point I wish to insist on. I have done so before, but I trust the evidence I now bring will settle the matter for ever. It has been said, Oh, the Photographic Copyright Union is just a London clique got up in their own interest, and they don't study the provincial photographers one bit. This is quite contrary to the facts. The Secretary keeps a diary of letters and business. I propose to give you an extract for one month, stating the town from which the correspondence emanates in order of reception:—Winchester, Redhill, Chester, Whitehaven, Belfast, Chester, Buckhurst Hill, Fairford, Southport, Denton, Chester, Sidmouth, *London*, Whitehaven, Southport, Newquay, Chester, Dublin, Portsmouth, Belfast, Belfast, Sydenham, Newquay, Enfield, Chester, Belfast, Oxford, Belfast, Oxford, *London*, Enfield, Belfast, Hastings, Birmingham, Hastings, Birmingham, Hastings, Elgin, Forres, *London*, Duns, Sittingbourne, *London*, *London*, Elgin, *London*, Bradford, Forres, Duns, Elgin, Sittingbourne.

The next annual meeting of the Photographic Copyright Union will be on September 29, the Wednesday following the opening night of the Royal Photographic Society's Exhibition, at the Princes' Rooms, St. James's Restaurant, at eight o'clock. All members, non-members, professional or amateur, are cordially invited.

At the conclusion of his address Mr. Bishop handed the President the minute-book of the Photographic Copyright Union Committee, and, in order to refute the suggestion that had been made that the Union was conducted by a London clique, a list of the towns in which those who had applied to the Union for advice was read out. Mr. Bishop instanced this list as sufficient to show that provincial photographers very largely took advantage of the Photographic Copyright Union's assistance in matters affecting copyright.

After remarks by Messrs. Henderson, Fall and Webber, the President, in moving a vote of thanks to Mr. Bishop for his address, characterised the Photographic Copyright Union as a very useful

Society, and advised all amateurs to register such of their photographs as were worth it.

As on Monday evening, the evening programme wound up with a display of lantern slides, and a demonstration of the Chassagne process was also given.

Wednesday, July 14.

The Annual General Meeting was held at the Town Hall, the President in the chair. The minutes of the Leeds Annual General Meeting having been read and confirmed, the balance-sheet, which had been audited by Messrs. Howson and Fall, was presented and adopted. This has already been published in the pages of the Journal, and shows a balance in hand of 161*l.* 13*s.* With regard to the item of 21*l.* as a contribution to the Traill Taylor Memorial Fund, Mr. Drage stated that the trust deed rendered necessary for the administration of the fund was in preparation, and that arrangements were being made for the delivery of a lecture in the forthcoming autumn.

The Convention of 1898.

Mr. Drage having read letters from the delegates of the Hastings Photographic Society, who were present,

Dr. Grey, the President of the Society, rose and said that he attended at the wish of his Society to emphasise the formal invitation which had just been read. Hastings, for natural beauty and historical associations, stood second to no other town as a suitable meeting place for the Convention. The invitation to the Convention was most hearty. The Borough Association supported the visit, the Mayor and Corporation would afford the Convention a hearty welcome, and the attractions for photography were many.

Mr. Algernon Brooker, the Secretary of the Hastings Society, very cordially seconded the invitation.

Mr. George Mason (Glasgow) proposed that Glasgow should be the next meeting place. It was ten years since the Convention had visited it, and he reminded the meeting that he had extended a similar invitation last year at Leeds, so that Glasgow had the prior claim. Having dilated upon the great natural beauties of the neighbourhood of Glasgow, he said that the three photographic societies of the town would unite in welcoming the Convention.

Mr. J. Stuart (Glasgow), in supporting the proposition, said that when one went to Glasgow there was so much to see that it was difficult to know when to stop. The societies would heartily welcome the Convention, and the Town Council would also extend a reception. With regard to Dr. Grey's allusion to the old castles in the Hastings neighbourhood, they at Glasgow had not many castles, as they were a peace-loving people; but the scenicand other attractions of the district were very great.

Mr. C. H. Bothamley moved that the invitation from Glasgow as the meeting place of the Convention for 1898 be accepted.

Mr. Pringle seconded, and said it was encouraging to have so many cordial invitations. Hastings would certainly form an admirable meeting place, but Glasgow had a very strong claim upon their attention.

A vote being taken, the invitation from Glasgow as the meeting place for 1898 was accepted nem. con., and Mr. Mason acknowledged the cordiality of the acceptance. Mr. Stuart also promised to try and arrange for fine weather.

A hearty vote of thanks was passed to the Hastings delegates for their invitation, and the hope expressed that it would be renewed for the 1899 meeting.

Dr. Grey acknowledged the vote, and said that no doubt the Hastings Society would be pleased to welcome the Convention in 1899. With regard to the weather it did not require arranging for, as it was always fine at Hastings.

Election of Council.

The election of Council was then taken by ballot, Mr. Tottem and Mr. Bingley being appointed scrutineers. The result was announced as follows:—

Surgeon-Major Adcock, Great Yarmouth; Harold Baker, Birmingham; Thomas Bedding, London; C. H. Bothamley, Weston-super-Mare; J. J. Briginshaw, London; F. A. Bridge, London; Alexander Cowan, London; W. Crooke, Edinburgh; Sir Howard Grubb, Dublin; Herbert Denison, Leeds; A. Haddon, Londo H. M. Hastings, London; A. Horsley Hinton, London; Sydn Keith, London; Paul Lange, Liverpool; C. Phipps Lucas, Londo Percy Lund, Bradford; J. L. Lyell, London; Major Lysagl London; George Mason, Glasgow; A. F. Mowll, Liverpool; W. Naunton, Shrewsbury; J. Porrit, Leicester; Andrew Pring London; H. P. Robinson, Tunbridge Wells; J. C. Ruthven, Dubli A. Seaman, Chesterfield; John Stuart, Glasgow; Henry Sturme Coventry; W. Taylor, Leicester; Alexander Tate, Belfast; E. Wall, London; J. H. Walker, Leeds; H. Snowden Ward, Londo G. Watmough Webster, Chester; S. B. Webber, London; W. Welford, London; J. B. B. Wellington, London; A. Wern Dublin; F. W. Williams, Shrewsbury.

Messrs. Martin J. Harding of Shrewsbury, Godfrey Bingley Leeds, and H. Harvey George of Great Yarmouth, are by Rule ex-officio Members of the Council respectively for one, two, and thr years.

Mr. Pringle proposed a vote of thanks to the Local Committe and to Mr. Harvey George in particular, who, he said, was singular gifted in organizing ability.

Mr. Drage, in seconding, remarked that Yarmouth ought to b proud of Mr. George. He also thought that Miss Hewett, who ha rendered Mr. Harvey George very great assistance in the clerica work of the meeting, should be coupled with the vote.

Mr. Harvey George, who was very warmly applauded, said tha the Convention's appreciation of his and his co-worker's labours wa an ample reward for what they had done. He also thanked them o behalf of Miss Hewett. He felt the compliment passed on him as great honour.

A vote of thanks having been passed to Mr. Drage, the Genera Honorary Secretary of the Convention, Messrs. Howson and Fal were on the motion of Mr. Bedding, seconded by Mr. E. J. Wall, re appointed auditors, and the formal business of the meeting ter minated.

A "demonstration" of the Dansac-Chassagne process was the given by the President, who, by request, undertook the task for th purpose of disproving the suggestion which had been freely made that special skill and knowledge were needed on the part of thos who produced the coloured photographs.

The meeting having adjourned, the usual group of members wa taken in front of the Town Hall by Mr. F. H. Sayers of King-street Great Yarmouth. The local police kept the necessary space clear After the exposures had been made, the members passed in front of the moto-photographic camera of Mr. Prestwich, who took an animated photograph of them. In the afternoon, Mr. Prestwich hastened to town, developed the negative, and made the positiv therefrom. Returning to Yarmouth on the following afternoon, th animated photographs were projected on the screen at the Thursda evening meeting. The pictures, which were of excellent quality evoked great admiration, and Mr. Prestwich was very warmly con gratulated on the enterprise and celerity with which he had pro duced them.

In the afternoon a considerable number of members journeyed to Caister Castle under the leadership of Mr. C. Runbold. Other parties were attracted to Gorleston, and, as the weather was extremely fine, a very large number of plates were exposed.

The Annual Dinner.

The annual dinner of the members of the Convention was held in the Minor Hall of the Aquarium on Wednesday evening, the President (Mr. Cembrano) occupying the chair. The attendance was large, and the festivity passed off with great *éclat*. Most of the prominent members of the Convention were present.

After the toast of "The Queen" had been honoured, "The Convention" was given by the President, who, in reviewing its work, pointed out that the Yarmouth meeting was notable for the fact that one of the papers to be read during the week was the outcome of the Convention's determination to endow and promote photographic research.

Mr. Drage, whose name was coupled with the toast, said that the membership of the Yarmouth Convention nearly touched that of Leeds, which was a record. He had been fully recompensed for his labours by their appreciation of them.

Two telegrams from absent members were then read, one of them

being from Mr. A. C. Baldwin, who hoped that each "plate would be backed with good digestion and that elation would follow."

Mr. Bothamley gave the toast of "The Local Committee," upon whom the members of the Convention were dependent for their comfort and pleasure. The toast was associated with the name of Mr. Harvey George, who acknowledged it on behalf of the Local Committee and himself. It was his first year as a Conventioner, and he hoped it would not be his last. The toast of "The President" was given by Mr. F. A. Bridge and acknowledged by Mr. Cembrano.

During the evening, songs and recitations were given by many of those present and an enjoyable festivity terminated at a late hour.

Thursday, July 15.

In delightful weather, and under the leadership of Mr. E. J. Humphery, about 120 members left the Stonecutters' Quay, and proceeded in a special steamer up the river Bure, past the village of Stokesby on to Acle, and from thence past St. Benet's Abbey, South Walsham Broad, the river Ant, and to Horning Town and Ferry. At Salhouse Broad a picnic was held and excellent opportunities were afforded to photograph this picturesque part of the Broad district. After lunch the party contined by steamer to Wroxham Broad and on to Wroxham Village, returning by train from there to Yarmouth.

As the day was bright and clear, a large number of exposures were made, the characteristic river and broad scenery looking its best in the July sunshine.

An alternative excursion to Aylsham and Blickling Hall was attended by about twenty members. The fine architectural features of the Hall supplied many opportunities for photographic work.

The Points of a Lens.

At the evening meeting Mr. Thomas R. Dallmeyer, F.R.A.S., addressed the members on this subject, using lantern slides to illustrate his remarks. Having pointed out that, by the employment of too short-focus lenses, an exaggeration of perspective was produced, he advised the use of lenses of long focus, and remarked that an included angle of sixty degrees did not give distortion at the sides of the plate. Distortion, it is true, was not apparent if the picture were viewed from a distance equal to the focal length of the lens with which it was taken, but this method of looking at photographs was a gymnastic exercise. They wanted a photographic convention as to what was the best angle to maintain so that the appearance of the picture should look right. He recommended the selection of a lens which had the power of covering a larger plate than that for which it was intended, and slides were shown illustrating the advantage thus obtained, especially when it became desirable to remove the lens from the centre of the plate. After a very lucid explanation of what rapidity and depth of focus meant, Mr. Dallmeyer touched upon his method of ascertaining the focus of a lens, and reminded his hearers that they must not be misled by the length of the camera draw. Boissonnas' telephotographic picture of Mont Blanc required the camera to be drawn out sixty inches, but, by turning the lens round and placing the negative in front of the positive, an extension of thirty-five feet would be necessary. A slide of a diagram that could be used for determining astigmatism, upon which error the lecturer made many interesting remarks, was next shown. On the subject of the internal reflections of lenses, the lecturer made the suggestion that it should be taken in hand and worked out by some member of the Convention. Curvature of the field and other points were touched upon. Mr. Dallmeyer finally showed an excellent series of lantern slides made by Mr. T. C. Hepworth, which illustrated the effects of distortion produced by wide-angle lenses at the sides of the plates. The lecturer concluded an interesting discourse, which was attentively listened to, by a recommendation to photographers to keep to lenses giving the limit of angle he had previously mentioned. Mr. Dallmeyer's paper will subsequently appear in full.

After some remarks by Mr. Washington Teasdale and other members, a vote of thanks was passed to Mr. Dallmeyer.

Mr. A. Haddon then read a paper by himself and Mr. Grundy on

STRENGTH OF HYPO SOLUTION AND TIME OF IMMERSION FOR FIXING ALBUMENISED PAPER.

By A. Haddon and F. B. Grundy.

The permanence of prints on albumenised paper and their freedom from yellowness with age undoubtedly depend on the elimination, by the fixing bath, of the insoluble salts of silver. Up to the present we have not been able, by means of hypo alone or with the addition of other salts, to reduce the quantity of silver left after fixation below a certain small percentage, and it is this small quantity of silver that ultimately causes the high lights to turn yellow, and finally the print to materially change in colour.

Our standard works on photography lead us to infer, since no mention is made of it, that hypo is capable of removing the whole of the silver from the high lights of a print on albumenised paper, and the usual recommendation with regard to fixing is to make up a twenty per cent. solution of hypo, and immerse the print in it. The volume of such a solution that we ought to take for a given area of paper is, in almost all cases, left to the judgment of the operator.

The only mention of the quantity of hypo required for fixing paper that we have come across is given in *The Art and Practice of Silver Printing*, by H. P. Robinson and Captain Abney, page 93, where it is said that one ounce of hypo will fix with safety three sheets of paper. It is quite possible that one ounce will do this; but, if we have to take a twenty per cent. solution, using one ounce of the salt, we should have five ounces of the solution only in which to immerse our three sheets of paper—rather a small volume—unless we fix the paper in batches of half or whole sheets, which would make it a tedious operation.

We have some difficulty in discovering the origin of the usual recommendation to fix albumenised paper in a twenty per cent. solution of hypo for fifteen minutes, but finally found a recommendation very much like this in the classic research of Messrs. Davanne and Girard, published in vols. iii. and iv. of the *Photographic News*, 1859 and 1860. They recommend a solution of from fifteen to twenty per cent. of hypo, and time of immersion from ten to fifteen minutes.

We will quote their own words: "Our experiments were made upon solutions five, ten, fifteen, and twenty per cent. This last strength appeared to give the best results, and we stopped at it, although there was nothing absolute in it; it is a medium strength, and may be diminished or augmented without any inconvenience."

Further on they say: "In every experiment we have made we have found that, after an immersion in the hypo bath of ten minutes, the proofs obtained in the ordinary way, even without previous washing in pure water, were completely fixed; it is, therefore, only in exceptional cases, as in employing excessively thick paper, of concentrated baths of soluble chloride, or of nitrate of silver, that we must consider how long it will be advisable to prolong the fixing, which, as observed by Mr. Le Gray, should be as brief as possible."

From the above it will be gathered that in 1860, in many cases, the paper on removal from the printing frame was transferred directly to the hypo solution, and with this method it was not astonishing to find that some silver was left in the paper. We must also bear in mind that albumenised paper of those days was feebly albumenised, highly salted, and not toned before fixation. Messrs. Davanne and Girard, seeing the possibility in certain cases, when the paper was not washed before fixation, of the formation of insoluble salts of silver due to the excess of silver coming into contact with the hypo, recommended that the fixing solution should be compounded as follows:—

Hypo	100 grammes.
Common salt	25 „
Bicarbonate of soda	10 „
Water	500 c.c.

Here we have definitely laid down twenty per cent. The addition of the chloride of sodium was to prevent or retard the formation of the insoluble thiosulphate of silver and sodium, and, to prevent the solution becoming acid, bicarbonate of soda entered into the composition of the fixing bath. When the intermediate washing took place between the printing and fixing, a weaker bath was recommended, and depending on the thickness of paper, the time should be varied from ten to fifteen minutes.

The quantity of silver per sheet in the paper after washing was found to be 1·3686 grammes by the same gentlemen. The maximum we have been able to obtain from modern papers is ·3186 grammes of

silver per sheet. From this we may naturally conclude that most probably the images produced on these highly salted papers were mainly silver reduced from the chloride, and not from the organic salt of silver. On modern papers, on the contrary, the image is formed mainly by the action of light on the organic salt of silver.

In the experiments we have recently made, in order that the results may be comparable, we have always used the same amount of hypo per sheet of paper, whatever the dilution or concentration of the solution, and from some preliminary analyses we found that the silver was reduced to a minimum, other conditions being constant, when the hypo was made alkaline with ammonia. The quantity added was 4 c. c. to each litre of solution (about 1 drachm per 40 ounces.)

It might seem at first sight that the dilution of the hypo would have little influence on its power of dissolving chloride of silver provided there was sufficient of it present, but this is not so; a one per cent. of hypo, when allowed to act for fifteen minutes, left in the paper 33·5 per cent. of the silver. In all cases, excepting where otherwise stated, we have compared the silver left in the paper after fixing and washing with the silver which mere washing in water was unable to remove.

As our analyses led us to the conclusion that no practical results could be hoped for by using very dilute solutions of hypo, we need not trouble with them.

The fixing bath recommended by Messrs. Davanne and Girard, and which we have already given, failed to remove more silver than does ordinary hypo.

A ten per cent. solution of hypo for ten minutes, followed by another of forty-six per cent. for five minutes, produced no better result.

We have made over forty analyses of papers fixed in different ways; the most interesting results we have obtained are shown in the following table. The different figures give the quantity of silver in grammes per sheet left in the paper with four baths of different strengths, and the paper being left in these solutions for periods varying from five to twenty minutes.

Percentage of Hypo.	Time of Fixation in Minutes.			
	5	10	15	20
5	·0160 ·247	·0200 ·308	·0200 ·308	·0180 grammes. ·278 grains.
10	·0140 ·216	·0142 ·219	·0160 ·247	·0140 grammes. ·216 grains.
15	·0160 ·247	·0188 ·290	·0180 ·278	·0200 grammes. ·308 grains.
20	·0200 ·308	·0180 ·278	·0180 ·278	— grammes. — grains.

This table reveals one curious fact, which could only be arrived at by analysis, that is, that below and above a certain strength of hypo more silver is left in the paper than when using that particular strength.

A ten per cent. solution of hypo, in from five to ten minutes, removes more silver from paper than does a stronger solution in the same time.

This is fortunate, as by using hypo of this strength there is less danger of the delicate half-tones of a print being dissolved than would be the case if the strength of the solution were doubled. The quantities of silver left in the different pieces of paper vary, but this if due to two causes, most probably experimental error and inequality in the thickness of the layer of albumen on the paper.

Messrs. Davanne and Girard, in their paper, say that a fifteen or twenty per cent. solution of hypo, when allowed to act for ten minutes, completely fixed the proofs. It is very unfortunate that they did not give the method they adopted in order to arrive at this result.

We have experimented with two different brands of paper, and the amount of silver left in one is ·0148 grammes per sheet and in the other ·0145 grammes. It must be perfectly clear to every one that, if the complete elimination of silver from the high lights of a print is the main condition for its permanence, then that paper which retains most silver when we have fixed and washed must of necessity be the least permanent. This also points to the fact that the preparation of the albumen or its purity has some effect on the amount of silver finally left in the paper.

In the early days of photography pure fresh egg albumen was used, but now frequently, in order to obtain extra gloss, the albumen is allowed to partly decompose before it is coated; sulphur compounds may thus be formed which combine with the silver and are insoluble in hypo.

We thought it would be instructive to experiment with albumenised paper made some twenty years ago. We were fortunate in obtaining a couple of sheets from Messrs. Atkinson & Co., of Greenwich. The total silver in this was found to be per sheet ·6172 grammes, and silver left after fixing ·0123, less than in modern papers.

In conclusion, we have confidence in recommending that papers (albumenised) should be fixed in ten per cent. hypo made alkaline with ammonia in the proportion mentioned above, and that the fixing, unless the paper be unusually thick, be not continued beyond ten minutes.

The sensitising of the paper and the method of analysing for the estimation of silver we have already given in previous papers.

Mr. A. L. Henderson thought that hypo as generally used was much too strong, the consequence was that strong hypo would be left in the print, and if the latter were placed in impure water a reaction would be set up. He strongly recommended the use of dilute solutions of hypo for fixing purposes.

Mr. S. B. Webber inquired the effect of temperature in using a fixing bath at the strength recommended by Mr. Haddon.

Mr. Henry Sturmey asked if experiments had been made with other papers than albumen.

Mr. J. Stuart (Glasgow) asked if experiments had been made in treating the prints with salt after washing.

Mr. H. Snowden Ward asked if the danger of dissolving the half-tones referred to by Mr. Haddon had been proved by experiment.

In the course of his reply Mr. Haddon remarked that the reaction mentioned by Mr. Henderson would depend entirely upon the impurity contained in the water. As to the effect of temperature, of course this varied the results; he might mention that his experiments were made at a temperature of 17° C. Answering Mr. Sturmey he said, that about four years ago he read a paper on the fixation and washing of gelatine prints. He found it possible to remove the whole of the silver from the high lights of the prints, so that further experiments were not necessary. As to Mr. Stuart's question, the conversion of the free silver left after washing into chloride would not produce any ill effects. Answering a member who inquired how long the paper should be washed after being alumed, he said nobody alumed albumen paper. In conclusion, he said he hoped to undertake further experiments on the effect of sensitising pure albumen.

Mr. Haddon having been cordially thanked for his paper, lantern slides were shown, and, as already mentioned, the animated photograph of the members was projected.

Friday, July 16.

The morning broke dull and depressing, but the sun burst through the clouds about 10.30, and the weather for the rest of the day was faultless. The excursion was to Oulton Broad, under the leadership of Dr. P. H. Emerson, and the members to the number of about 100 left Stonecutters' Quay by steamer and proceeded over Breydon Water and the River Waveney past St. Olave's, Somerleyton, on to Oulton Broad, where yacht racing was in progress under the management of the Great Yarmouth Yacht Club. Lunch was partaken of on two wherries. Some of the party also proceeded to Beccles. Oulton Broad looked very charming with the many prettily flagged craft, and once more much photography was indulged in. The excursion was thoroughly enjoyed by all, and the party returned to Yarmouth well pleased with the day's outing.

At the evening meeting the following papers were read:—

THE HALF-TONE PROCESS POPULARLY EXPLAINED.

By William Gamble.

Having undertaken to popularly explain to you the half-tone process, I ought perhaps, in the first place, to make it clear to you

what is meant by the term in its relation to process work. I have heard it stated that the process is called half-tone, because in the reproduction the picture is lowered to a half-tone, that is to say, possessing neither high lights nor deep shadows. That explanation is, however, a mistake. The term half-tone came about in this way. The difficulty of the early process workers was to find a satisfactory method of reproducing the half-tones of the photograph in surfaces for mechanical printing. Taking the case of typographic blocks, it was easy to reproduce high lights by leaving the printing block hollow in those parts, so that they would not be covered with ink, and would deposit no colour on white paper. It was also easy to reproduce shadows by leaving those parts in relief on the block so that the ink was deposited on them, and thus transferred a patch of solid colour to white paper. But what would become of the half-tones? It was not possible by the operation of passing a roller over the block to lay half a shade of ink on certain parts. Thus it was a picture without half-tones, and therefore merely a silhouette; but, these early process workers were led to reflect that the wood-engraver got his tones by means of lines of more or less thickness and by placing lines closer or further apart, also that the aquatint etcher obtained his effects by varying openness of a resinous grain, whilst the mezzotinter and the steel-plate engraver obtained their effects by the closeness and size of the stippling; and, again, the lithographer took advantage of the grain of a coarsely ground stone. Thus it was argued that, if the half-tone of a photograph could be broken up into some sort of a grain, the problem of making the photograph into a printing block would be solved. We know that this problem was solved after years of patient experiment by placing in front of the sensitive plate a ruled screen, that is to say, a network composed of crossed lines on glass. The photographic image was thereby broken up into a grain, which reproduced the tones of the photograph by dots of varying size. Half-tone reproduction was accordingly achieved, and, naturally, the method was called the half-tone process. I do not know who first called it "half-tone;" but, probably, it arose in this way: It was variously called by different workers according to their fancy; for instance, it was the "Meisenbach" process—so called after the patentee of one of the methods, whilst others called it the "nature" process, and, besides, there arose such names as "heliotype" and "luxotype." But the public wanted to know what these strange terms meant, hence it was usual to add "a process for reproducing the half-tones of photographs," and this soon became shortened into "the half-tone process." So this name, ugly as it is, has stuck to the business.

Now let us see how this half-tone process is worked.

The first and most important requirement is a screen. This consists of two pieces of plate glass cemented together, and on the inner sides of these two plates are ruled parallel black lines, the lines on the one plate crossing those on the other so as to form a network. The most perfect screens are those made by Levy, of Philadelphia. His method of manufacture consists in coating the glass with a ground which will resist a glass etching mordant, cutting the lines through the film by a diamond point driven by a dividing engine, and then etching the glass left bare. The resulting furrows are filled in with an opaque pigment, and the screen thus formed is very perfect in the two essential qualities of opacity and transparency. These screens are ruled in various degrees of fineness or coarseness, the ruling determining the size of the grain points. Thus, for poster work, 55 lines per inch is used; for newspaper blocks, to suit rough and rapid printing, 75 or 85 lines are used. Various styles of printing are accommodated with rulings between 100 to 175 lines to the inch. It is possible to get screens of 200 to 240 lines to the inch, but the blocks from these are a bit too fine for British printers. Most of the half-tone work you see about in the magazines and illustrated papers is done with screens of about 120 to 150 lines to the inch. It is to be noted that the finer the screen used the greater the amount of detail; the coarser the screen the greater the amount of contrast.

The screen is placed inside the camera immediately in front of the sensitive plate, but not in contact with it. In fact, provision must be made for securing a variable distance between the screen and sensitive plate, for reasons which I will presently explain. In cameras made specially for half-tone work, there is in the back of the camera a screen carrier, which is made to travel to and fro by means of a lever or screw, and the distance at any point is shown by an indicator on the outside of the camera. When the dark slide is inserted and the shutter drawn, the screen carrier is brought forward as near to the plate as may be required. In the same way the screen may be brought up to the focussing screen until the right effect is observed, when the distance shown by the indicator is noted, and the screen can be set again to the distance when the dark slide is put in.

The old-fashioned way of using the screen was in the dark slide, having two carriers—one for the plate remaining fixed, and the other for the screen being separated to varying distances by means of strips of cardboard. It was a clumsy method, and I have here a newly invented slide in which there is a mechanical screen adjustment from the outside, and there is an indicator plate to show the distance. It forms a very compact arrangement, and its great merit is that it can be attached to any camera, so that, if any of you want to dabble a bit in the half-tone process, you can fit up even a half-plate camera with this slide.

The lens used for the process may be any good rapid rectilinear, but it must have a slot for Waterhouse diaphragms, not an iris, because it is necessary to vary the shape of the diaphragm openings. It is further necessary that the lens be fitted with a prism or mirror for reversing the negative, otherwise, as we print from the negative direct on to the block, we shall get a block which will yield an ultimate print the wrong way about.

The remaining fit up is pretty much in accordance with the ordinary arrangements for copying.

Having told you about the apparatus used, I must next explain to you the principles involved in the making of a half-tone negative.

You want to know why it is necessary to place the screen at a certain distance, and how that distance is arrived at; also why it is necessary to vary the shape of the diaphragm, and what is the shape required.

First as to the screen distance. The early workers thought that the screen had merely a "chopping-up" effect on the picture. The result of this want of knowledge was that the operator simply placed the screen close to the sensitive plate, and aimed at making it cast a sharp shadow of its lines on to the plate. The result was that the early half-tone work had a raspy, gauzelike effect, which entirely killed all the delicate tone and detail of the picture, and even to this day some work has this characteristic as a result of the imperfect knowledge or perversity of the operator, who is much inclined to cling to obsolete methods of working. It was not till operators began to understand that the screen was an optical instrument, and not simply a sieve, that half-tone work began to improve. Investigation into the theory of the screen working showed that under suitable conditions the screen might be regarded as a collection of tiny apertures which acted the part of pinhole lenses. It was just like the battery of "gem" lenses that you are familiar with for making postage-stamp portraits, except that each aperture, instead of making a separate picture of the object, could only photograph the illuminated spot of light at the diaphragm opening.

Thus you will understand there was a double action going on, viz., that, whilst the picture was photographed through the screen by means of a lens, every aperture of the screen was doing a little business on its own account, namely, it was photographing the shape of the spot of light at the diaphragm opening. Of course, if the apertures of the screen were acting as pinhole lenses, they required a working focus; hence a screen distance was necessary.

Now you will say, "We quite understand that this pinhole action may go on, but what is the use of it?" To explain it I must go forward a little to the printing process.

What we require in a half-tone negative is a means of printing the picture on to the zinc or other metal plate in dots of varying size—big dots for black shadows, medium dots for half-tones, and fine dots for high lights. Now, if we are to print dots, we must have a negative punctured, so to speak, with holes, but it is quite certain that, if the lines of the screen were in contact with the plate, we should not have a "perforated" negative, but the exact opposite, viz., a negative of separate dots, just as if you take a print from a piece of perforated zinc on to sensitive paper. But suppose you put the screen a little distance away, and allow the pinhole action to form a larger dot, you can understand that it is possible to carry this spreading action until each dot touches, and even overlaps its neighbour. Well, then, as the dots group themselves in spaces alternately like the black squares of a chessboard, you will see that, by making them spread until they touch, we get the "perforated" negative we require. In the old way, by assuming that the only object of the screen was to cast a shadow, the spreading of the dot had to be forced by long exposure, and by vigorous intensification, which made the negatives hard and screeny; but, by taking advantage of the pinhole action, the spreading is accomplished in a quick, harmonious, and natural way. Another important advantage is gained: we find that, the further the screen is from the sensitive plate, the less is its effect in breaking up the picture, and this holds good to the extent that, if the screen is far enough away, the negative shows no screen effect at all, you would not know the screen had been there. Thus you see that, by taking advantage of the pinhole

action, we can work our screen a considerable distance from the plate, and we get thereby more tone and detail. That explains the wide difference between the half-tone work of to-day and that of even two or three years ago. The improvement is due to operators having found out, consciously or unconsciously, this little secret of the working of the screen.

The altering of the shape of the diaphragm had the same object in view, viz., the spreading of the dot in a suitable direction, so that we may get the "perforated" negative I have described. As the dot is formed by pinhole action, it is obvious we can make the dot any shape we please by altering the shape of the diaphragms. Thus we find that square dots give a better joining up to each other than round ones.

Once the operator has grasped these leading principles of the process, the negative-making is an ordinary photographic operation, and either wet plates or dry plates may be used. There always has been a great prejudice in favour of wet plates, but, for my own part, I find just as good, if not better, results can be obtained on suitable photo-mechanical dry plates.

The negative made, it is printed on to a zinc or copper plate sensitised with a bichromated film, generally of albumen, gelatine, gum, or fish glue, the latter being now perhaps most extensively used. The process is analogous to carbon, the film, after being exposed under the negative, being developed by washing away the parts which have been protected from the light. The development is continued until the zinc is laid bare between the dots. Then the plate is dried, and, in case of fish glue, is heated until the glue is made so hard as to be acid-resisting. Then the plate can be etched until the dots stand in sufficient relief to yield a printing surface. The remaining operations are only those of fixing it for the typographic printing press by trimming up and mounting it to the height of type.

Now I hope I have made plain to you what this half-tone process is, and I want to plead with you to give it a little more tolerance. It is not yet perfect, but it is a young process and will improve. One so often hears tirades against it, and it is often said that "process" is antagonistic to the interests of the photographer on the one hand and the artist on the other. I do not believe any such thing. On the contrary, it has widened the scope of photography, and opened up a more extensive field for the artist. Where photography was only a method of producing portraits and views ten years or less ago, it now takes rank as one of the graphic arts. In this year we have been summing up on every hand the advantages we have gained from the prolific inventions of the present reign, but I think it has been overlooked how much has been due to three industries which have arisen out of processes invented and brought to perfection in what has been called the Victorian age; I refer to electrotyping, stereotyping (by the *papier-mâché* process), and photo-engraving. Take away these valuable auxiliaries of the printer, and we deprive at once the masses of the people of their cheap literature, whether it be in the form of books, newspapers, or magazines. Pictorial knowledge is the most easily imparted, and has played a large part in the literature of this reign; indeed, we cannot measure how great a debt this age owes to photography and the photo-mechanical processes by reason of the wealth of illustrations which they have provided—not simply pictures that amuse, but illustrations which have made scientific, technical, and general educational works far more valuable and instructive.

PHOTOGRAPHY IN NATURAL COLOURS.

By E. J. Wall.

It was not my intention to read a paper, but merely to show you a few slides in colours; but, as I am announced to give a talk, I suppose I am right in saying just a few words, particularly as our President has singled out this as one of those branches which have been most persistently before the public since the last Convention.

He had also said, Have we heard the last word on colour photography? I should say certainly not—at least, I hope so; for this would mean standing still, which is retrogression and not progression.

The first process to claim attention was that of MM. Dansac & Chassagne, of which they had been the first photographic public to see an actual demonstration, and therefore they had all been able to form their own opinion on it; and, whilst it had hardly come up to their expectations, he would remind them that, until further trial, it was not wise to jump to definite conclusions. We now come to the process of Dr. Joly, which you will remember was hinted at when we met in Dublin, and an example of which was shown by the kindness of Dr. Joly at our meeting at Shrewsbury. This process, as well as that of Mr. Ives, is founded upon what is called the theory of the three primary colour sensations.

So much has been said and written on this subject that I do not intend to do more than touch but lightly upon the main theory of the subject. We have in nature millions of colours and tints, yet they are all formed by the admixture or suppression of the spectrum colours, such as are formed when white light is split up by a prism. The spectrum practically consists of six principal colours—red, orange, yellow, green, blue, and violet. Even these six can be formed from three only—that is to say, our eyes are sensitive to three main colours, which are red, green, and blue. The colour which excites the red sensation I will show you on the screen, then the green, and then the blue-violet. By mixing green gradually with the red, we obtain orange, and finally yellow; and, by mixing the violet with the green, we get bright blue, and, with all three, white. I might state that it is extremely difficult to obtain absolute white, using three sources of light; but, at any rate, we get a very close approximation. Dr. Joly makes his negatives behind a screen ruled with alternate lines of red, green, and violet, and projects the positive through a screen similarly ruled with slightly different colours. Mr. Ives uses three different screens, and thus obtains three images, which are combined by his ingenious instrument, the Krōmskōp, which we had an opportunity of seeing on Monday night.

I have one or two slides to show by this method, and, if they do not register perfectly, you must not blame me or the lantern, but put it down to the fact that we had not a room in London large enough to give us this working distance. The positives used have absolutely no colour in them, and all they do is to merely stop out the light and allow the colours to be formed by the admixture of the coloured light.

Mr. Bennetto's process is, as you know, a secret, and therefore I can tell you nothing about it.

With regard to three-colour printing, this is making slow but steady headway, and the only difficulty in the way is the want of suitable commercial plates. So far as we know at present, it is not possible to sensitise gelatine plates to perfectly satisfy the requirements of three-colour work. The making of the screens is an easy matter, and, should any one desire it, I shall be pleased to give the method of making them that I have used, and which I have found to answer as satisfactorily as is possible, using commercial plates. The best work can only be turned out by using collodion plates and sensitising them yourself.

In reply to queries, Mr. Wall stated that he first of all used the very thinnest and whitest patent plate he could obtain, four inches square, and this was coated with a solution of gelatine, 16 grammes to 250 c. c. of water. The red screen was made by cementing together with Canada balsam two gelatinised plates, which were soaked respectively in a saturated solution of naphthol yellow and a one per cent. solution of cochineal red A, an aniline dye, which was rendered faintly alkaline with ammonia.

The green screen was made by soaking plates in a one per cent. solution of brilliant green and naphthol yellow respectively, and cementing together.

The violet screen was made by soaking a plate in 1:400 solution of ethyl-violet. The ratio of exposures for these screens was respectively, without screen, 1; with violet screen, 3; with green screen, 9; with red screen, 30.

At the conclusion of the General Meeting the Council Meeting was held. Mr. John Stuart (Glasgow) was chosen President of the Convention for next year, and Mr. F. A. Bridge was elected Hon. Secretary. The usual votes of thanks terminated the proceedings.

On Saturday the Convention gathering of 1897 dispersed, but some members undertook the excursion to Ipswich.

"COSMOS" AT THE CONVENTION.

A week consists of seven days, and in each day there are twenty-four hours. Total, 168 hours. It is astonishing how little you can do in an hour, or in 168 hours; on the other hand, only a Photographic Conventioner, who works steadily through the official programme, and participates in all or any of the unofficial celebrations, without which no well-regulated Convention meeting is now considered complete, can realise how much it is possible to attempt and achieve during the week. A rigid adherence to the eight-hours-a-day doctrine at a Convention meeting would place you in the unsatisfactory position of not hearing, seeing, and going through more than one-third of what is at your command and disposal.

In the blazing sunshine of last week, Yarmouth, girt as it is by a and river, was refreshingly breezy, and thus the physical energies the Conventioners were not depressed to the extent that must fallibly have occurred had the gathering taken place at an inland wn. The business meetings were well attended, and the papers ere followed with interest. At least one of them—that by Mr. addon, in which this indefatigable worker told photographers w long and in what strength of solution of hypo albumen prints ould be fixed—is calculated to be of practical service to the whole otographic community; while Mr. Dallmeyer on lenses, and Mr. mble on half-tone, made themselves extremely intelligible to eir audiences. In the facilities with which it afforded its members e opportunity of learning something of pictorial photography, lour work, animatography, copyright, and other subjects, the armouth meeting, when it comes to be pondered over at leisure, ill, I am persuaded, sustain the not universally admitted reputa- on of the Convention as a great photographic teaching and educa- onal influence. I sincerely hope that in future there will be no parture from the principle that, while the note of pleasure is to distinctly sounded at a Convention meeting, the business side is, d should be, uppermost. The Convention is the one photographic thering throughout the year at which photographers from all rts of the country are present, and to miss the chance thus offered placing before them the very latest aspects and phases of photo- aphic work would be equivalent to countenancing the shallow joke at the Convention is merely a photographer's picnic. By all means us play hard while we may, but let us also work hard when we ould.

Before the next meeting takes place I may possibly discuss the most obvious fact that the educational opportunities of the Conven- on will bear considerable development; but, in the mean while, let e for the nonce pass into a lighter mood. Broadland looked its st last week. For the time, those who were paying their first visit the district could readily imagine themselves in a new country—a untry of wide-reaching marshland intersected by reed-fringed rpentine streams, dotted with the huge sails of tacking wherries, d shooting up here and there a church steeple, a windmill, or a use roof above the low-lying trees. The haymaker was busy in e fields, and the placid fisherman sat on the river banks as we ssed, and eyed us with curiosity and wonder, for Broadland is azyland, and it is only here that the art of sweetly doing nothing cultivated to perfection.

Fishing, boating, swimming, sailing, and driving supplied a variety occupations for odd hours, and, thanks to the thoughtfulness of the hornton-Pickard Company in sending their changing "shutter" nt wherever Conventioners most did congregate during the week, enormous number of plates were used. At Norwich it was aced in the Cathedral. There did not appear to me to be a great al of work done in the interior of the beautiful edifice; but the ceedingly bright light of the day was responsible for much out- or photography. Blickling Hall, Caister Castle, and Yarmouth elf gave the architectural photographers their principal chances ring the week. For the rest, I fully expect to hear of a huge mber of river, sea, and broad views.

As we steamed up the Bure on Thursday, past Horning to Sal- use, my thoughts carried me back to poor William Bedford, who this district some years ago, and just before he died, took some otographs that now, I think, hang in the Photographic Society's om at Hanover-square. The names of the late R. L. Kidd and e late A. M. Levy also occurred to me, for it was in Broadland at I last found myself out with them. At Salhouse we had a ass picnic on a little island. There were over a hundred of us. It ould, doubtless, have been an enjoyable meal had it not been neces- ry to dispense with knives and forks and consume the not sily procured victuals in the free and graceful fashion of the road- nstructor. But what mattered this when our leader, Mr. E. J. umphery—invested with the temporary dignity of Port-Admiral—was geniality itself, and "led" us with his usual urbanity? It was fair and sunny on the waterway, nature looked her greenest and freshest, and you could expose plates to your heart's content. After some of us had confirmed the well-known fact that tea and civility at Wroxham, the head centre of Broadland, are rare and costly, we all went back to Yarmouth as happy as children after a "treat."

Friday, to Oulton Broad, by water, Dr. Emerson, who had successfully contracted with the Clerk of the Weather "to do us well" meteorologically, being our leader. The broad looked wonderfully pretty and animated with racing craft shooting hither and thither, and when the contests were over, and the little vessels were decorated with coloured streamers, the scene in the bright sunlight was delightful to look upon. The lunch, in the holds of two wherries, was quite a civilised affair compared with the previous day's meal. Of all the excursions during the week, none was more pleasant than this. Dr. Emerson's house is situated on Oulton Broad, and I am told that in the course of the afternoon he rowed a small party of friends there, that two photographs were taken, and that a friendly contest in composition took place between the host and a very well-known photographer, whose identity is disguised under the title of "The Duke of Edinburgh." But this may be only rumour, which is always in a state of abnormal activity during a Convention week.

Viscount de Torre Bella, formerly known as Mr. Russell Manners Gordon, was present at his first Convention, and the number of lady members was larger than at any previous meeting. I noticed that the photographic activity of several members of the sex to which I have not the honour to belong was greatly in excess of their fellow-members of the male sex. I suppose, in the not distant future, there will be a lady President of the Convention. This year there was a Convention baby—a little dot of perhaps two and a half—who, with the very greatest confidence, babbled of cameras and lenses in the most engaging manner. Of the older faces, those of Webster, Mowll, and Lange were not seen; but a glance at the group will show that there were many new ones. The familiar figures of A. L. Henderson, George Mason, Frederick York, and many others are absent from the picture, owing to its having been taken a quarter of an hour earlier than had been arranged for.

The humorous incidents of the meeting would fill a good-sized book in the narration, and I doubt not that they will form the theme of conversation among Conventioners for many a long day; but this JOURNAL is not a comic publication, so that I must impose a stern reticence upon myself in this respect. A word of praise where it is called for. Mr. Harvey George and the members of his family spared neither their time nor their labours during the week on behalf of the Convention, and the thanks of every one of us are their due. As to Mr. Drage—well, our old friend was just the same tireless worker as of yore, and, as my readers know what that means, any special words of compliment to him are not needed.

I am bound to say that there is just one respect in which the Convention scarcely shines, and that is in slighting the Press at the dinner by the omission of the usual toast of "The Fourth Estate." This is a blunder, if not an act of ingratitude. It was a pressman who helped to found the Convention, and who, as I can personally testify, worked hard for it in its early days. Again, the Press to-day with singular unanimity loyally upholds and supports the Convention. I wonder what would happen to the institution were it not so? But I base this complaint on higher grounds than those mentioned. Custom has long since assigned "The Press" a place in the toast list of almost every public festivity, and it ill becomes the Convention to disregard so well-established an ordinance. I write with no inconsiderable knowledge of what takes place at festive gatherings of photographers, and I am sorry to have to single out the Convention dinner as the one function of the kind at which the toast of "The Press" is left out.

I do not know who is responsible for this wholly undeserved snub, but I hope it will not be administered again, and I confidently call upon our Glasgow brethren to see that the right and proper thing is done next year.

And so, with this single growl, let me say good-bye to the Yarmouth Convention of 1897. It broke record in the matter of fine weather, and it will live in history as having made many valuable contributions to our photographic knowledge. Good fellowship reigned throughout, and all went off without a serious hitch of any kind. So may it always be. COSMOS.

News and Notes.

THE Société Caennaise de Photographie will hold their second international Exhibition at Caen from November 14 to November 28.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. J. W. Eadie, for his negative, *Staircase, Municipal Buildings, Glasgow.*

THE LATE GEORGE DAWSON.—We are enabled to supplement the brief notice of the late George Dawson which we gave last week. The deceased was born in 1821, and for fifteen years was lecturer on photography at King's College, London, in succession to the late Thomas Sutton, B.A. In 1864 he became one of the Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY. Besides his extensive journalistic contributions on photography, he edited two editions of Hardwich's *Photographic Chemistry*, and also translated and edited Monckhoven's *Optics*. In conjunction with Thomas Sutton, he wrote the *Dictionary of Photography*. He devoted much attention to the subjects of the fading of silver prints and the cause of pinholes in wet-plate negatives. The preparation of flexible transparent films also engaged his attention. Through the exertions of many friends, Mr. Dawson was enabled to pass the last seven years of his life in the Charterhouse.

THE South London Photographic Society have projected an excursion to the North of Ireland, leaving London August 13, and returning August 22, 1897. The leader is Mr. Howard Esler. The following is the programme:—Friday, August 13, leave Euston, 7.30 p.m. Saturday, 14, arrive at Larne about 8.30 a.m. (King's Arms Hotel); breakfast on arrival; staying at Larne till Sunday morning. Sunday, 15, leave Larne for Cushendall (twenty-six miles), stopping *en route* at Glenarm, Carnlough, Garron Tower, and Red Bay; hotel: Glens of Antrim Hotel, Cushendall. Monday, 16, morning: drive to Glenariff Glen (seven miles); afternoon: drive to Bally Castle (fifteen miles) *vid* Cushendun; hotel: Hunter's Hotel, Ballycastle. Tuesday, 17, walking excursion to Fair Head, Grey Man's Path, &c. Wednesday, 18, drive from Ballycastle to Giant's Causeway (twelve miles), visiting *en route* Kenbane, Carrich-a-Rede, and Dunseverick; hotel: Kane's Causeway Hotel. Thursday, 19, day at Giant's Causeway. Friday, 20, drive across country to Cushendall; hotel: as above. Saturday, 21, drive to Larne; leave Larne about 5.30 for Stranraer; arrive London Sunday morning, August 22.

WE gather from the daily press that a meeting was held on Thursday, July 8, with the object of inaugurating the movement for collecting and making photographic historical records of the British Isles. Representatives of the Royal Society, the Society of Antiquaries, the Royal Photographic Society, the Royal Geographical Society, the Royal Archæological Institute, the Royal Institute of British Architects, and kindred societies were present. Sir Benjamin Stone, in the course of an address, said that word description was rapidly giving way to pictorial illustration, and photography had brought to our aid a more plentiful, graphic, and accurate form of pictorial record than that of the most valuable ancient drawing. The Trustees of the British Museum fully agreed with him that photographic records for the instruction of present and future generations could not fail to be of the greatest value and interest, and had expressed their willingness to take charge of the proposed collection. Lord Rosse, Captain Abney, Mr. St. John Hope, of the Society of Antiquaries, and others also spoke in favour of the scheme, and eventually a Committee, composed of the following gentlemen, was appointed to form a National Photographic Record Association: Lord Crawford, Sir Edward Thompson, Sir Benjamin Stone, Professor Meldola, Captain Abney, Dr. Mill, and Messrs. Alexander Graham, St. John Hope, Philip Norman, W. W. Watts, Fagan, Lawrence, and Robinson.

THE PHOTOGRAPHER AND THE COUNTESS.—At the Epsom County Court, on the 16th inst., before his Honour, Judge Lushington, the adjourned hearing of the case in which Messrs. Claude & Co., 8, Great Portugal-street, London, sued Countess Julia Sztaray, of 2, Queen Anne-villas, Epsom, and Countess Flora Sztaray, of the same address, to recover the sum of 50*l.* by reason of the defendants' wilful acts in overturning and destroying a photographic camera, and destroying films, negatives, and other apparatus at Epsom Downs on April 27 last. A further action was brought against the defendants by Mr. Vernon Henry Tovey, a journalist and photographer, to recover the sum of 10*l.* damages for assault and battery at Epsom Downs. The defendants paid 5*l.* into Court in satisfaction of all damages, but denied all liability. Mr. Tovey, on being called, stated that on April 27 he went to Epsom Downs to take photographs. He obtained permission to take his camera on to the balcony of the Epsom Downs Hotel. After he had taken up his position there, Countess Julia went on the balcony with her daughter, and asked him if he was going to stay there all day. He replied that he supposed he could stay there as long as he liked, as he had paid for his stand. Countess Julia demurred at this, and said she had been in the habit of walking round the balcony for the past twenty years. A few minutes later he heard the Countess Julia say, "If the man gets in my way, I will throw the camera over." So after that he was asked by her to allow her to pass, and he at once acceded her request. Subsequently witness was engaged in arranging to take a series of photographs of the finish of a race. He was just going to turn the handle to make the exposures when the Countess Julia said she wanted to pass. Witness was engaged in taking photographs at the time, and asked her to wait a minute, but she refused, and called her daughter, the Countess Flora, and told her witness would not let her pass. The daughter advised her to push the camera over, and a few moments later she took hold of witness's assistant and swung him round. She then took hold of one of the tripods, and said, "You will see all about this. She pulled the camera towards her, and a part of it struck him in the eye, injuring it seriously. The camera then fell, and was greatly damaged. The camera was worth between 80*l.* and 100*l.* The defendant, Countess Flora Sztaray, stated that her mother called her, and told her that Mr. Tovey would not let her pass, whereupon she took hold of the camera, and only used sufficient force to make a clean passage to allow her mother to pass. Tovey resisted the action, and in pushing aside a portion of the camera came into contact with Mr. Tovey's eye. She denied using more force than was necessary. She had not a hasty temper. Witness, in reply to his Honour, said her mother was an American and had married a Hungarian. Police-constable, V 186, said he had great difficulty in getting the names and addresses of the defendants; it took thirty-five to forty minutes. The elder Countess, on being called, said she was in delicate health and asked to be allowed to answer questions in a private room. Mr. Sell, who appeared for the plaintiffs, strongly objected, and his Honour upheld the objection, remarking that, if she could go to race meetings, she could give evidence in open Court. Witness, in reply to questions, said she wanted to get to her daughter, but plaintiff would not let her. She was sorry he got his eye injured, but it was a very slight injury. Mr. Powell, for the defence, said the defendants were entitled to remove the obstruction, which prevented them from exercising the right granted to them by the proprietor of the hotel. Eventually his Honour gave judgment for the defendant, Julia Sztaray (the elder defendant), as he did not think she was responsible for the damage, and as the younger defendant had paid 5*l.* into Court, he should give judgment for her also, consequently the costs will fall on plaintiffs.

Patent News.

THE following applications for Patents were made between July 7 and July 14, 1897:—

ANIMATED PHOTOGRAPHY.—No. 16,171. "An Improvement in the Apparatus for Exposing, Projecting, or Perforating the Films used in Animated Photography." J. ADAMS.

COPYING APPARATUS.—No. 16,327. "An Improved Copying Apparatus for Photographs." E. BÜHLER.

WASHER.—No. 16,343. "Automatic Washer for Photographic Prints." E. G. BIRD.

ANIMATED PHOTOGRAPHY.—No. 16,383. "An Improved Device for Regulating the Speed of Photographic or like Films when in use, either for Taking or Exhibiting a Rapid Succession of Photographic or other Pictures of Moving Objects." Communicated by H. Casler. E. B. KOOPMAN.

ANIMATED PHOTOGRAPHY.—No. 16,386. "An Improved Apparatus for Exhibiting a Succession of Photographic or other Pictures." Communicated by H. Casler. E. B. KOOPMAN.

ANIMATED PHOTOGRAPHY.—No. 16,388. "Web Feeding and Handling Mechanism for Consecutive View Apparatus, Projecting Machines, and the like." Complete specification. H. CASLER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
26.....	Bradford Photo. Society	Question Night.
26.....	North Middlesex	*Treatment of Figures.* Rev. F. Lambert, M.A.
27.....	Birmingham Photo. Society ...	Descriptive Account of the Photographic Survey of Warwickshire. P.T.Deakin.
27.....	Hackney	Excursion Prints: Judge's Criticism.
28	Photographic Club	Open Night.
29	Bradford Camera Club	*Hints on Portraiture.* A. Priestley.
29.....	Polytechnic	Submit Saturday's Proofs and further consider the Club Card.
31.....	Oldham	Excursion: Old Oldham. Leader, Greaves, jun.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 15,—Mr. Herbert C. Rapson in the chair.

Mr. P. EVERITT showed a 12×10 camera, and related its history, which was one calculated to severely test the best of workmanship. It formed part of the contents of a tin-lined case which had been wrecked with the vessel on which it was travelling, and had spent some three months under the water. The metal lining had been perforated, and the glued joints of the camera and the fittings and polished woodwork much damaged, besides which the bellows had been reduced to pulp by the action of the water. He acquired it at a salvage sale, and now showed it after the necessary repairs had been done, when it appeared a very serviceable piece of apparatus. A front was not provided, which allowed of the lens being placed in a number of differe

tions by simply turning the movable piece supporting the lens, the ning for the latter being cut some distance out of the centre for the pose. With this camera he was using a Steinheil lens—the orthostigmat, e 2—which he found to answer very well, finding no difficulty in getting image sharp right up to the edges of the plate. He said the circle of mination was of about eighteen inches diameter.

Ir. T. E. FRESHWATER detailed his experiences with the Dallmeyer matic lens, at the rapidity of which he had been surprised. At a recent t to the riverside, the plates with him, except two which were rapid ones, e ordinary plates, but the whole of them were fully exposed with the p shutter he was using.

general discussion took place upon the comparative qualities of the wing number of lenses which claim the first place for excellence, especially h regard to flatness of field and covering power. It was remarked that icians were quite able to produce lenses whose curvatures were either to front, so to speak, or to the back, by modifications in their construction, l the deduction surely was that by further modification a perfectly flat d could be secured to a lens.

Mr. EVERITT spoke of the impossibility of doing this while the proper terial was still wanting. However, the lens which most nearly approached t perfect flatness of field which was so much wanted in his opinion would the Concentric lens working at *f*-22. It was a question, said Mr. Everitt, ether it was not easier to correct for spherical aberration with the old ss than with the new.

Mr. FRESHWATER and others remarked on the respective lengths of life of old and new glass, it being a serious question whether that of the new uld equal the old glass. He also referred to a case of perishing of a croscope lens.

Mr. BECKETT urged Mr. Everitt to undertake to test and compare one with other the best rectilinear lens he could get, the Goerz lens, the stigmatic, d his own favourite, and report his conclusions.

Hackney Photographic Society.—July 13, Mr. Rawlings in the chair.—ie May excursion pictures were exhibited, and the Judge's criticism read. ie successful competitors were: Mr. Westcott, first and second; Mr. ensler, third; Mr. Williamson, fourth; Mr. Hull, fifth; Mr. Hunt, sixth.

North Middlesex Photographic Society.—July 12, Mr. R. Child Bayley the chair.—Mr. R. B. Heard was elected a member, and Mr. G. A. Hale, Miranda-road, was nominated for membership. Mr. H. W. BENNETT, R.P.S., then delivered a lecture entitled

ARCHITECTURAL PHOTOGRAPHY.

photographing the interiors of cathedrals and churches, he recommended king views of the aisles and chapels rather than a general view of the whole, being more frequently the work of one man, they showed more consistency style. The angle of view should seldom exceed 60°, and judgment was quired if a larger angle had to be included. The camera should never be gher than five or six feet from the ground, as that was the height at which e building was designed to be seen; a view taken from a considerable evation made the photograph look as if it had been taken from a small odel, as the perspective was quite different. For outdoor subjects, good ffused light was better than sunlight. The camera should have a front pable of a considerable rise, and preferably have a swing front as well as a ving back. Plates of medium rapidity were best to use, backed with ramel. Halation showed more frequently with an under-exposed plate an on one with a full exposure. He said that rectilinear lenses were ecessary in most cases, but were not essential in some cases. He showed a ide of a sectional view and plan of Ely Cathedral, and afterwards views ken from points marked on the plan, and explained the influence of the ghting from the windows on the exposure, the colour of the glass and uildings outside having to be allowed for. The development of the plate as then touched on; for subjects strong in contrast a developer weak in all s constituents should be used, having first brought the lights up to nearly ie correct density with a normal developer. This method brought up detail the shadows without unduly blocking up the lights. After some discussion id a few questions, Mr. COX moved that a vote of thanks be passed to the cturer, which Mr. CROUCH seconded. A vote of thanks to the Chairman ncluded the meeting.

FORTHCOMING EXHIBITIONS.

1897.		
pt. 1–Oct. 13	Glasgow International.	W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
ecember 9–11	Aintree Photographic Society.	

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM: GREAT YARMOUTH MEETING.

To the EDITORS.

GENTLEMEN,—At the conclusion of the Convention it may be faithfully serted that the Great Yarmouth meeting has been a thorough success. The papers and demonstrations this year (owing to the untiring ex-tions of Mr. Thomas Bedding, acting as Secretary to the Sub-committee for arranging same) have been of a very high standard of excellence, the very large attendance at the evening meetings (the largest on record) proving the great interest taken by all photographers in the important matters placed before them, whether relating to the technical or artistic side of photography.

The exhibition of pictorial photographs, comprising many famous pictures by the best workers of the present day, was, owing to the exertions of the President, Mr. F. P. Cembrano, and Mrs. Cembrano, a very great source of enjoyment to both photographers and the general public, who visited it in large numbers.

Mr. Harvey George, our very energetic Local Hon. Secretary, while arranging for the excursions, &c., arranged at the same time in each district that we visited *for fine weather also*, and so we were always favoured with blue skies and bracing breezes both on land and water, and, while on all sides one could hear Mr. George being thanked for his heavy labours, it was somehow omitted to thank him for his negotiations with the authorities concerned so that we should be favoured with such glorious weather.

And now, after my three years' work for the Convention, may I ask the kind indulgence of fellow members for my many sins of omission and commission? I shall always remember the many kindnesses of which I was the recipient at Shrewsbury, Leeds, and Great Yarmouth while directing the affairs of the Convention at those centres.

After presentation of the balance-sheet for the Great Yarmouth meeting, my friend and successor in my present post (Mr. F. A. Bridge, of East Lodge, Dalston-lane, N.E.) will take office, and I am confident will most ably fill the position, and I look forward with pleasure to seeing all the old faces, together with many new ones, at Glasgow in 1898, under the presidency of that genial Glaswegian Mr. John Stuart.—I am, yours, &c.,

R. P. DRAGE.

BACKED PLATES,

To the EDITORS.

GENTLEMEN,—I was very much amused with your remarks, p. 450, July 16, on the subject of "Backed Plates." I have used a large number of the coloured collodion backed ones. I have not found any difficulty. I never attempt to remove the whole of the backing until the plates are fixed; when I think the development is nearly complete I scratch off sufficient backing with my finger-nail, or a knife, so that I can judge the density. I would very much prefer a backing that is soluble and innoxious in the developer, but this necessitates coating after the emulsion, and this would not tend towards the keeping of the plates; there should not be two opinions about this. I find an easy way to remove the backing is the free use of Monkey Brand soap applied with a pad or nail-brush. I congratulate the manufacturers who have introduced this innovation, and they will undoubtedly soon reap a reward for their labours and liberality.—I am, yours, &c., A. L. HENDERSON.

Westmoor Hall, Brimsdown, Middlesex, July 19, 1897.

THE NEW ERA IN LENS CONSTRUCTION.

To the EDITORS.

GENTLEMEN,—As your correspondent (Mr. Everitt) asked, in your issue of July 2, whether it was not "a fact . . . that we have to thank Germany, not Leicester," for the inception of the "New Era," I naturally supposed that he had come across some passage in Messrs. Taylor, Taylor, & Hobson's pamphlet, in which he imagined a claim was put forward of the Cooke being the first of the newer lenses.

To compare lenses like the Goerz to the Cooke, in Mr. Everitt's fashion, is hardly fair. Roughly speaking, anastigmats may be divided into three classes:—

I.	II.	III.
Wide angle, good correction throughout, as the Goerz.	Lenses of narrow angle, with rather better correction within it, as the Cooke.	Combination lenses, as the Zeiss Satz and Stigmatic.

In some respects the third class is the best, but, being composed of a greater number of elements, they are likely to be less rapid in action than Classes I. and II. As I pointed out before, the narrower angle covered by the Cooke is better corrected than the wider angle covered by the Goerz; the former also is nearly half again as rapid as the latter, Consequently, for wide-angle work, such as architecture, the Goerz is the better; but for rapid, and ordinary, and hand-camera work, the Cooke is superior.

If I am not mistaken, Messrs. Taylor, Taylor, & Hobson are going to put a wide-angle series of Cooke's on the market; then Mr. Everitt can test their rival merits to his heart's content.

Of course, no good optician sends out lenses that are "out of centre," but as the Cooke method is easier, and the construction simpler, the glasses can be adjusted with less trouble, and accurately enough for three-colour work. When this can be done in such a labour-saving manner, one of two very great advantages *must* follow:—(1) More time and work can be devoted to the construction of the lens itself, or (2) the lens can be produced at a far less cost.

Next, may I ask which is the greater: an angle of 68° covered at *f*-8, or one of 67° at *f*-7·7? Not much, I should imagine.

It is not possible to render a more perfect photograph, from a purely technical point of view, than we can with our present lenses, unless methods of printing are totally revolutionised. Even with enamel bromide paper, which, of all papers, possesses in the highest degree the capability of rendering detail, much, very much, of the detail given by *any* good modern anastigmat on the negative is lost. Surely this is, from any reasonable photographer's point of view, "unsurpassable excellence." I feel inclined to echo Mr. Chapman Jones's words: "Is it worth while to go any further" in the construction of lenses? With regard to your correspondent's example, it must be remembered that *f*-6·8 is less than *f*-6·5, and even then, as the *amount* of astigmatism in the Cooke is not quoted by Mr. Everitt, it is impossible to judge which is the more perfect. Some curves would be more to the point.

For my own part I can make a quarter-plate Cooke lens cover a half-plate well without much stopping down, and this is a fairly wide angle.

I have not yet had an opportunity of testing the Zeiss *f*-6·3 Satz lens, so cannot judge of its correction.—I am yours, &c., P. JOURDAIN.

Ashbourne, Derbyshire.

AN INDIAN READER'S DIFFICULTIES.

To the EDITORS.

GENTLEMEN,—What I think BRITISH JOURNAL OF PHOTOGRAPHY high-class paper. Since six years I am constant reader, which period I patronise paper. Wherefore I say why such bamfoozul statements crop up, which I notice much more in summer season time, therefore I say English climate not suited to the photographic argument at this season. Thus, when I read issue dated May 21, I see Mr. Chapman give lecture. He say yellow stain in negative not good, and image of same is made of mud, and best kind of negative must be all silver image and no mud. He also say not to put acid in fixing bath, and not to wash negative till after fix. Mr. Chapman he write book on negative subject, so I say what fellow write book that fellow know better than fellow who are not capable of such. But those fellow going to lecture for purpose of profit to learn have great impertinence of contradiction to Mr. Chapman. One fellow he say he want image of all mud. One other say it is bad thing not to wash negative. Third fellow he say he never wash, but proper thing is to put acid in fixing bath. No two fellow agree and all opinion seem too poor reader fellow *oolta poolta*, what English fellow call topsy-turvy. All listener fellow know better than lecturer, and make great contradiction. and when he finish make hearty thanks. My printer boy, Ram Bux, he say that these fellows only make to pull his leg with hearty thanks, which must be very bad manner of such, and not proper for record in high-class journal. Perhaps these contradicting fellow not know Mr. Chapman write book, so I beg to make suggest that he make presentation of copy to each.—I am, yours, &c.,

June 24th, 1897. RAM DEEN.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

H. L Morel, Market-place, Nottingham.—*Photograph of coal mine taken at Cinder Hill Pit.*

T. P. Sugton, Photographer, 14, East Mayfield, Edinburgh.—*Two photographs of Rev. Alexander Neil, minister of Mayfield Parish Church, Edinburgh.*

G. M. Ambrose, High-street, Burnham, Essex.—*Photograph of yacht "Rowena" winning Jubilee cup (weather bow), topmast struck. Six men on deck.*

H. J. BLISS.—The address is 86, Warwick-street, Pimlico.

WELSHWOMAN.—The address is Frith & Co., Reigate, Surrey.

G. M. AMBROSE.—Communicate with the local superintendent of police.

ADDRESS WANTED.—Mr. H. Hallier, of 41, High-street, Upper Sydenham, requires the address of Mr. Buchillot, formerly of Southampton-row, W.C.

BLINDS FOR STUDIO.—R. C. Adopt the dark blue material for the curtains. The other, by nature of the fabric and its colour, would be very undurable in a photographic studio, although it would look well at first.

SALE OF BUSINESS.—W. From the tenor of your letter, we conclude you have acted very "smart"—not to say discreditably—and have got yourself in an awkward fix, and so we shall offer no advice as to how you shall get out of it. We may add, however, that we think you will require very clever legal aid indeed to do so.

SHOWING SPECIMENS WITHOUT PERMISSION.—S. W. We think your customer is quite justified in not paying his account while you persist in exhibiting the portraits for which the account is, in your shop window after he has forbidden your doing so. We may tell you that he can take action against you for showing the portraits, and recover damages, and, as you are obstinate in the matter, you may think yourself fortunate if he does not do so.

LEASE.—INQUIRER. Your query, as put, seems very vague. You ask us we "think a landlord or builder would take in hand to build a stud on the promise of its being leased for, say, ten years or even less —We think he would not, unless he had something more than a m verbal promise that it would be leased after the expense had been go to, also that some security for the rent was forthcoming. Possibly have not understood the query rightly.

ANIMATOGRAPHS.—S. WARDLEY. We cannot, if you send us the drawin undertake to give an opinion as to the probable validity of any pate you may take out for your apparatus. We do not undertake to gi opinions on the validity or otherwise of patents, and, even if we di it is obvious that we could not do so in a case like this, seeing t number of patents that have been applied for in connexion wi animated photography during the past few months, the majority the specifications of which are not yet published.

YELLOW PRINT.—W. C. B. writes: "A quarter-plate print has been broug in to me to copy taken twelve months ago. It is very yellow, and t figures seem to be sunk in the paper. Taken by an amateur, it woul I think, be good enough if I could get rid of the yellowness, which, think, must be imperfect fixing. What would you suggest?"—Copy t print with a plate orthochromatised with eosine, and you will, doubtles get a fairly good reproduction. Possibly, if the print were treated wi a solution of bichloride of mercury, the yellowness would be remove that is, if the picture is toned with gold.

COPYRIGHT.—PROFESSIONAL BEGINNER has opened a business in a sma provincial town, and is taking views of the interesting places in t neighbourhood, and says he is threatened with proceedings by anoth photographer in the town for taking views of the same subjects whic he has taken and made copyright. Our correspondent adds, that i every case he has been careful to avoid taking the view from the sam point, or including exactly the same amount of subject, and asks if h has done any legal wrong?—Certainly not; or moral wrong eithe Further, he has a perfect right to plant his camera in exactly the sam spot, and include exactly the same view if he likes. His older neigh bour may have the copyright in the photographs he has taken, but, course, he has none in the subjects from which he took them. Th thing is absurd, ignorance, or "bluff."

APPRENTICESHIP.—A. E. B. asks: "Would you kindly answer the following If an apprentice of nineteen be bound to a business for three years by stamped agreement, can he, on coming of age, legally consider himse free from the bond, without in any way incurring from his master legs proceedings against his parent or guardian who signed the contract o his entering the business? According to the following argument h appears to be quite free: On signing the indenture, the parent guardian legally undertakes the responsibility of the apprentice carry ing out his part of the contract; but, when a person comes of age, parent or guardian, according to law, ceases to be responsible for an act of this said person. Again: When a minor signs a contract or leg agreement, it is not considered legal, owing to the fact of his being minor. Under both these arguments, it seems the apprentice should b quite free. How does the matter stand according to law?"—Th apprentice is free on arriving at the age of twenty-one. If any mi representation as to age has been made on the part of the parent guardian as to the apprentice's age at the time of binding, he may b proceeded against for damages.

VARIOUS.—G. W. CROOK says: "Will you kindly answer the three following in your next issue: 1. The last two tubes of gold (Johnson's) I hav dissolved in distilled water have been clear enough when mixed, but, standing a few hours, the solution has gone quite muddy-lookin When added to sulphocyanide water, it makes the bath of a distinct blue cast, and I imagine it does not tone as well, or go as far as ought to. Although the gold bottle was well cleaned before breakin the last tube, and the salt dissolved with distilled water, there is a scu on the top. Can you give reason? 2. How to make a chemical mirr so that it may be seen through from back, but not from front, and co (probable) of 12×10 inches? 3. I have just received value of silver i hypo fixing baths. Reading so much about the advisability of keepin baths, and sending them to refiner, I have done so for some time, and la week sent off the deposit from many gallons. After the expense about two pounds of liver of sulphur, and postage 6*d.*, I am about 1*s.* 3*d* in pocket for the trouble and mess of the thing, which most certainly not worth it. I never sent any away before, but certainly expected mor than 5*s.* worth of silver in over two pounds of residue. Is there no mean of judging value before sending?" In reply: 1. Either the bottle was dirt or the distilled water impure. 2. Possibly some reader will reply to th query. 3. The only way of judging of the value of residues, befo sending them to the refiner, is by an assay. The way of making one ha often been described in these columns. The mere weight of the residu as we have frequently pointed out before, is no criterion as to its valu That depends upon the quantity of silver it contains.

*** Owing to pressure of Convention matter, several notices of book apparatus, and many other communications are unavoidably hel over.

NOTICE.

With this number of the JOURNAL *is presented a half-tone illustration by th Strand Engraving Company of the group of members of the Twelfth Annu Photographic Convention of the United Kingdom, assembled at Great Yarmout on Wednesday, July* 14, 1897. *The negative was taken by Mr. F. H. Sayer of King-street, Great Yarmouth. A key, with the names of members, as far a it has been found possible to obtain them, is also given.*

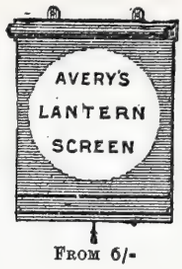
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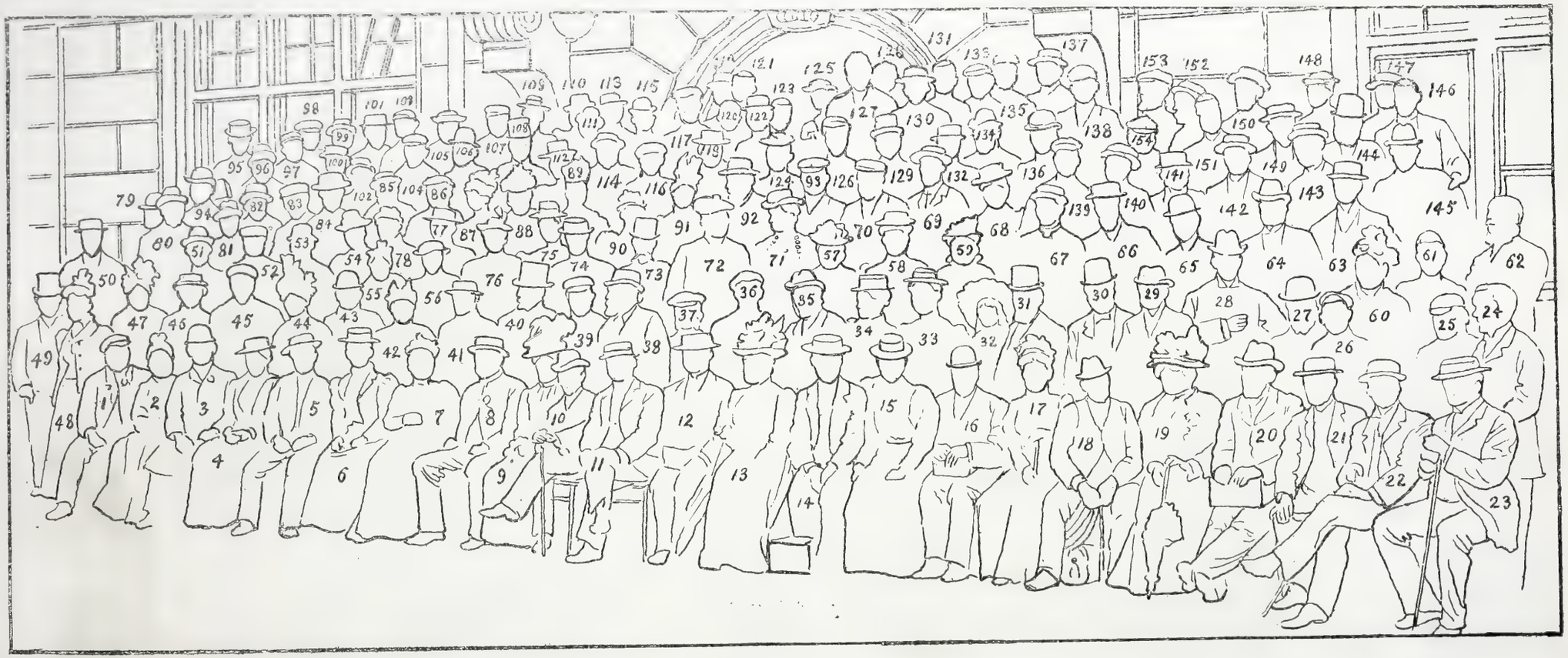
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HELD AT GREAT YARMOUTH, JULY 12-17TH, 1897.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1943 Vol. XLIV.—JULY 30, 1897.

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EX CATHEDRÂ.

It is announced that the French Société d'Encouragement pour l'Industrie Nationale has awarded the Giffard prize of one thousand francs to M. Ducos du Hauron for his work in three-colour photography. On July 2 we drew our readers' attention to the fact that our contemporary, the *Photo-Revue*, had started a subscription for M. du Hauron. We trust that the recognition of his work by the Society will be the means of arousing increased interest in the subscription.

* * *

During the Convention meeting we had many opportunities of observing the skilful manner in which Mr. Charles L. Burdick employed his "aerograph" for producing worked-up portraits. Judiciously employed, the aerograph should be of invaluable assistance to professional photographers, enlargers, &c., as the projection of a fine or coarse stream of deposit is obtainable at will, and the resultant images are very effective. We were much struck by the facility with which, on a monochrome ground, Mr. Burdick produced very good effects in colour by the employment of very dilute water-colour solutions in the aerograph. He also showed us a photograph that had been extremely well coloured in about half the time that a Dansac-Chassagne result was being produced.

* * *

In the course of our many meetings with members of the photographic profession, it is very frequently our lot to be photographed; but, odd to relate, it is seldom that we see the results of the sittings. We are half tempted to surmise that the proportion of failures in the studio must be greater than is generally admitted. Fortunately, not all our sittings prove abortive, as witness two capital groups that are now before us. These come from Messrs. Negretti & Zambra, of the Crystal Palace, who, on the occasion of a recent visit of the photographic press to the Photographic Section of the Victorian Era Exhibition, were good enough to make two exposures on the party. The results are in all respects excellent, the likenesses of the members of the group being well rendered, and the posing, lighting, and retouching having been executed with singular taste and skill.

* * *

We this week print the first part of a translation from the *Bulletin du Photo-Club du Paris* of an article by M. Robert Demachy on the English photographs shown at the Spring Exhibition of the Paris Photographic Salon. M. Demachy's criticisms will enable many English photographers to see their work as a highly gifted French photographer sees it. Alike for the undoubted beauty and originality of his pictorial photographs as well as for the great skill which he possesses in aiming at and securing his effects, M. Demachy's opinions are entitled to respect. More than that, he possesses the faculty of appreciation in a high degree, and thus his criticisms come to us stamped with that authority of knowledge which does not always underlie the exercise of the *rôle* of critic.

* * *

Mr. H. E. Turner, the Hon. Secretary of the Photographic Section of the South-Eastern Union of Scientific Societies, writes us, drawing attention to the fact that the Union is anxious to acquire photographs illustrative of the geology of south-eastern England. The gift or loan of photographs or slides of the Upper Greensand, Gault, and Lower Greensand is particularly desired. The address of Mr. Turner is appended to his letter, which is published in our Correspondence columns this week.

We learn from the journal of the Photographic Society of India that Mr. Arthur Caspersz has resigned the Honorary Secretaryship of the Society, a position he has held for the last two years. His successor is Mr. H. N. Harris. In the last number of the Society's journal the editor suggests the holding of one-man shows. Of the club-room he writes: "When I visit the club-room, I find long chairs and tables covered with drying prints, and the printer Baboo hovering about, turning them over like cakes on a girdle." The Society now numbers over 400 members, and appears, from the annual report, to be in a flourishing condition. From a private source we learn that the Society's journal, which is published in Calcutta, is to have a rival, a new paper appealing to Indian photographers being about to make its appearance.

* * *

For the adornment of the editorial room, Messrs. J. Bulbeck & Co., of 167, Strand, have been good enough to send us a framed enlargement of one of their well-known interior views of Norwich Cathedral. The enlargement is in carbon by the Autotype Company, and does full justice to the original negative, prints from which have more than once secured Messrs. Bulbeck awards in open competition. In recent years there has been a distinct movement in favour of improving the technical and artistic qualities of architectural photography, in which Messrs. Bulbeck have been very prominent. Their work, indeed, is of a singularly high order of excellence, and is uniformly characterised by a conscientious endeavour to utilise the highest skill in selection, lighting, exposure, development, and printing, to secure sympathetic and unconventional treatment of architectural subjects, an endeavour in which they are meeting with admitted success.

THE PORTRAIT BUSINESS.

A few weeks back, it will be remembered, we alluded to the lack of remunerative business amongst portrait photographers, and suggested that the introduction of something of a new or novel style, that would command higher prices, would be desirable. Now, a thing to be novel need not be actually new; something that ceased to be a novelty thirty or forty years ago might prove one now if reintroduced. One is seeing that almost daily by the reinvention of old methods and old appliances, and their being turned to profitable account. Fashions, too, are ever changing, and many of those that became old decades ago become new again, as witness many of the present-day costumes. So it may be in photography. Styles of portraiture that did not take when they were first brought forward—perhaps because at the wrong time—might take now, if again introduced, and prove remunerative to some; and, supposing they required more skill to produce, so much the better for their producers.

Two or three old styles occur to us that might be given a trial by those who are on the look out for little novelties to give a fillip to their businesses. One we were reminded of by seeing two or three examples of eburneum pictures in the Photographic Section of the Exhibition at the Crystal Palace. These pictures were first introduced by the late Mr. Burgess, of Norwich, some thirty years or so ago, and very pleasing they were, when well done, as Mr. Burgess did them. As the name implies, they had the appearance of being on ivory. They were produced in this way: A positive, vignetted, was made from a negative in the camera by the wet-collodion process, the image being toned if necessary. The plate was then placed on a levelling stand, and a mixture, composed of gelatine and oxide of zinc, with a little glycerine to give flexibility, poured on. When this mixture was dry, the picture was stripped from the glass and trimmed. The quantity of mixture applied was such as to yield a film about the thickness of an ordinary visiting card, or perhaps a little thicker.

Of course, the production of the pictures by this method involves a knowledge of the wet-collodion process—a knowledge which many photographers do not possess. But they may be made in other ways, by the carbon process for example, developing the print on collodionised glass. Instead of using the gelatine mixture, xylonite, which may be had in thin sheets, in exact imitation of ivory, might be employed. This might even be coated with gelatine emulsion, such as that used for opal plates, and excellent results secured.

Many years ago some pictures were shown in London that were produced by a Russian photographer—Bergamasco by name—that made a little sensation at the time. They were large direct portraits vignetted, but, instead of being vignetted into the usual white ground, they were graduated into a black or very dark one. The lighting of the heads, which were from about four to six inches, was of a very bold character, and this was the more striking by the contrast with the dark ground and the dark frames in which they were shown. Although these pictures were very fine, Bergamasco had but few, if any, imitators here; possibly because of the prosperous state of the portrait business with the usual styles of small pictures then in vogue. This style of portrait might be worth a trial now, as there is a greater demand for large portraits than there was when these pictures were shown in this country.

Here is another style of portrait that might now be worth notice. Examples of it were shown about the same time as those just referred to, or perhaps a little later, by Denier. These pictures were also of a good size, and are somewhat difficult to describe, inasmuch as they had the appearance of great softness, or, rather, lacking in sharpness; yet, when closely examined, they seemed to be perfectly sharp. They were exceedingly bold and vigorous, and had the look of being on porcelain rather than on paper. They were produced by a "secret process," and it was the intention of Denier to have disposed of the secret to a limited number of subscribers; but, as the number fixed upon was not obtained, it was not sold, neither was the method of their production published, or, at least, with the authentification of the inventor.

There were at the time, as may be supposed, a number of suggestions as to how they were produced. One was—and that was the one that received the greatest credence as being the right one—that two negatives, in exact duplicate, were taken, each being developed only to half the usual density. The two negatives were then placed the one upon the other, the prints being made from this compound negative. Another suggested plan was that the plate was coated on both sides with a thin collodion, so that, while the image on the front of the glass was perfectly sharp, that on the back was, of course, out of focus. One plan that was suggested was to make, say, half the exposure with the lens at its sharpest focus, a quarter with it it racked a little outside the focus, and the remaining quarter with it a little within it.

Here is a method by which pictures, equal in effect to Denier's, were produced, and it answered well even with

egatives not specially taken for the purpose. It was to rint in the usual way until the print was about half done, nd then interpose two or three sheets of transparent gelatine, r a thin piece of glass, between the paper and the negative, nd then continue the printing to the proper depth. By arying the depth of printing before its introduction, and the hickness of the intervening media, a great variety of effects an be obtained.

Alteration of Röntgen Rays by Using an Old Crookes' Tube.—Before the meeting of the Paris Academy of Sciences on the twelfth instant, MM. A. Imbert and H. Bertin-Sands read a paper on the complexity of the bundle of X rays which described an apparently hitherto unknown property of a radiation tube that had been in use for a prolonged time. They found that the rays it emitted were quite different from those produced from a comparatively new tube, for, while the latter rays were obstructed by metallic and other screens, those from the old tube passed through them without appreciable absorption.

The Andrée Polar Expedition.—Herr Andrée has made a start, of that there is no question, but the result is still, up to the time of writing, in doubt. Telegrams have been received that carrier pigeons have been captured that were said to have been dispatched by Andrée from the balloon. Subsequent telegrams, however, throw doubt upon the matter as to whether they were sent off by Andrée; indeed, it seems to be pretty conclusive they were not. Authentic news is now anxiously awaited, both by Herr Andrée's friends and the scientific world generally. Some writers, from the first, have doubted the practicability of the scheme, and others have doubted the practical utility of photographs taken from a balloon, even if the pole were passed by that means. The optimist views on this expedition have not been great, but pessimist ideas have been freely expressed from the time that it was first projected. The result is anxiously waited for by all.

The Science and Art Department.—The Select Committee on the Museums of the Science and Art Department have agreed upon a second *interim* report. This report, it is said, further emphasises the danger of fire under the present conditions. These dangers are well known, and have been for years, as they have frequently been pointed out in the House and well emphasised in the public press. That matter may now, perhaps, receive some practical attention. It is to be hoped, on behalf of the public, however, that the main object for the appointment of the Committee will be carried out, namely, inquiry into the administration of the Department. The public know the danger the Museums are in; what it also wants to know is, whether the large sums annually granted to the Department are expended to the best advantage, and if it gets full value for the money. This object for the appointment of the Committee must not be lost sight of by *interim* reports on the dangers we were already fully aware of.

Photographic Evidence.—A rather amusing case in which photography was concerned was before the Southwark County Court one day last week. A photographer sued for a balance of 21*s.* for photographs taken of a Jubilee stand perspective in the Westminster Bridge-road. A point for the defendant was, that the photograph was taken from the wrong stand, and this was said to be proved by the fact that the picture included a waggonette in which the coachman was fast asleep. Here the photograph was evidence either that it was, or was not, taken from the wrong point. But it was evidence on another point, for the plaintiff said that the owner of the waggonette had purchased a copy of the photograph for 10*s.* 6*d.* as evidence that the coachman was asleep while in charge of his horses and trap. The coachman, it seems, had hitherto always denied that he ever went to sleep while in charge of the horses. At the end of the case, the Court held that the plaintiff must be satisfied with the 12*s.* he had received from the defendant. From the newspaper reports, it would seem that the photograph that was proof that the coachman was asleep while in charge of the horses was also evidence that it was not from the right spot from the owner of the Jubilee-stand's point of view.

Inflammability of Celluloid.—An explosion occurred at the electrical storage accumulator works at Woking one day last week, and it is reported that a large quantity of celluloid was destroyed, as well as the machinery. Since the lamentable accident in Paris with the cinematograph, through the mismanagement of the ethoxygen saturator, there has been a good deal said about the danger of celluloid films; and we have it upon pretty good authority that fire insurance companies are turning it to account by increasing the premiums on insurances where cinematographic exhibitions are given, even when the electric light is used as an illuminant.

There is no question that celluloid, *per se*, is highly inflammable, and, when once it is fired, it is almost impossible to extinguish it. But the case is different when it is coated with gelatine in proportion to its thickness. A thick film of celluloid coated with gelatine emulsion is very inflammable, and very difficult to extinguish if it once gets alight; but a thin film of celluloid, such as is used for the cinematograph, with a coating of gelatine nearly as thick as itself must be reckoned in a different category, for here the gelatine acts as a protection. If such a film is lighted, it is easily put out. In the first rollable film, on celluloid, introduced, that of Graffe & Jougla, of Paris, which is coated on both sides with emulsion, it is difficult to get it to light at all, and still more difficult to keep it burning after it is lighted—much more so than it would be the paper upon which this is printed. But, of course, insurance companies consider dividends and the means of increasing them.

The Metric System.—The Bill for legalising the metric system in this country is making substantial progress in Parliament. It has passed the Lower House, meeting with but little opposition, and last week it was read a second time in the House of Lords, and passed through Committee, with some trifling amendments, so that it is now likely to become law. This Bill does not go nearly so far as the recommendations of the Select Committee of 1895. That Committee was not only in favour of legalising the system, but of, after a brief time, rendering it compulsory, and also requiring that it should be taught in schools; but this Bill does not go to that extent, it simply renders the use of the metric system of weights and measures legal in the United Kingdom. Under the Act which came into force in 1879 all bargains or dealings were to be made according to Imperial weight, or measure, as laid down by the Act. This Act was passed to abolish the use of local or customary measures, and of the use of heaped measures, &c.

It will be interesting to see what effect this Act will have in furthering the adoption, commercially, in this country, of the metric system of weights and measures. Very little, we surmise. The classes that most use weights and measures, in trading, are very conservative, and we surmise they will scarcely be likely to leave the beaten track for the metric system, however much may be said in its favour. If the metric system is ever universally adopted here, some such plan as that recommended by the Select Committee of 1895 will have to be resorted to. That Committee recommended that the metric system be specially taught in all public schools, and that after a time its use should be made compulsory. Now that this system is legalised, it will also be interesting to note if it will be any more utilised in photographic formulæ than it is at present. Its universal adoption in this direction would prove a great convenience when once got used to, seeing that all Continental and many American ones are given according to it, and that they often suffer by conversion into English weights and measures.

Migrant Matter.—Many instances have arisen in which unexplainable images have been produced when developing plates which have been in contact with foreign bodies, and quite recently the volatility of zinc has been adduced as the cause of one set of these phenomena. From some experiments made by Messrs. S. H. & N. W. Emmens at the Argentaurum Laboratory, and published in the *Chemical News*, it would seem possible that most metallic bodies are capable of, if not volatisation, at least of transferability through air. These gentlemen took a circular disc, an inch in diameter, of chemically pure lead and one of gold similar in size, weighed them accurately, placed them in contact, keeping them together by a spiral of copper wire, and then suspended them in a wide-mouthed glass jar by means of a piece of string running through holes in the disc, and suspended through two holes in the cork of the vessel. They had previously cupelled a portion of the lead, and found that it left no residual metal after cupellation. The arrangement was put together on March 5; it was taken out and weighed in ten days, and again on June 2. The results of the three weighings were as follows:—

	Lead.	Silver.	Copper.
March 5	0·8931	0·50845	1·5421
„ 15	0·8932	0·50830	1·5420
June 2	0·893½	0·50810	1·5421

The copper on analysis gave no silver, but the lead disc gave on cupellation a bead of silver 0·00003 gramme. The writers add: "It would appear from this experiment that what is commonly regarded as solid silver is, in part at least, a migrant in one of matter. . . . . We use the term 'migrant matter' because the particles to which we refer are (in common with odours generally) much more akin to Crookes' fourth form of matter than to gases."

ALBUMENISED PAPER.

The valuable and interesting paper by Messrs. Haddon and Grundy, read at the Convention, comes at an opportune moment, when those who have not the opportunity otherwise may, at the Exhibition now open at the Crystal Palace, compare the possible keeping properties of albumen prints through long series of years with other of the older methods, which are usually supposed, partly by virtue of their freedom from albumen, to be more permanent. It will probably be conceded by any one carefully examining the specimens of old work there on view that the albumenised prints have, as a rule, passed the ordeal of time at least as successfully, as a rule, as the plain paper prints, whether produced by development or otherwise, and in many cases far more successfully.

Plain paper photographs, even when produced by the "printing-out" method, have usually been held to have the advantage of albumen in the matter of permanence; but, when the image was produced by development, an additional security was supposed to be afforded, indeed developed prints have been assumed to present the acme of stability obtainable with silver salts. How far these opinions are justified by an examination of the specimens now on view I leave to the judgment of the observer, but the impression I carried away myself is very decidedly favourable to albumen.

It is true that the positives on plain paper, some of which may be direct prints and others developed, though it is not possible in a hurried inspection to separate them as well as the negatives—which, by the way, the Palace authorities are pleased to describe as "collotypes"—are, as a rule, far inferior to very many I have seen in private collections, and do not, I admit, fairly represent the character and qualities that were obtainable by these old processes. They are strongly suggestive of sulphur toning, and, if they present anything like the appearance now that they did when newly produced, a very great change must have taken place in the fashions as regards tone. But to my mind they are most probably examples of change, for I have seen many prints, both direct and developed, as well as negatives that have presented, at the age of between thirty and forty years, an altogether different character.

On the other hand, I did not notice any conspicuous examples of fading amongst the albumen prints. There are, it is true, some that would scarcely pass muster at the present day; but, if we look back at the brown tones that were the fashion in the early "sixties," that is perhaps not to be wondered at. In contrast to these, however, we have only to turn to two of the three large prints shown by Mr. Osmond R. Green, which, although seven-and-twenty years old, are apparently as fresh as if printed yesterday. The two to which I allude are evidently printed on a different paper from the third in this exhibit, or I should judge so, on account of the difference in tone, which is precisely the rich purple-black that is obtained with the gelatine papers of to-day, though without the excessive gloss. On examining these, it is difficult to realise that they have stood over a quarter of a century, for, while the shadows and half-tones possess all the brilliancy and depth of a new print, the lights are absolutely devoid of the least suspicion of yellowness.

The third picture referred to is of a warmer or browner tone, more resembling the old "Saxe" paper, while the two others I should take to be "Rives." While this one does not exhibit the *fresh* appearance of the other two, I could not detect any symptoms of fading, and the difference in appearance I take to be due entirely to the difference in tone. I have one of Mr. Green's prints that has been in my possession a few months short of thirty years, and which is evidently printed upon the same paper as the last-mentioned. Up to three or four years ago this was as absolutely free from any change as a print could be, but it unfortunately hung the whole of one damp winter in a room that was seldom used, and the moisture-laden atmosphere started it in places on the downward track. The condition of affairs may be imagined when I say that in passing a duster over the frame one day, not only the gilt, but the mixture of glue and whiting underneath came away, leaving the wood entirely bare. This was surely a pretty trying ordeal for any silver print to undergo, although it was pasted over with paper at all the joints of the backing; but that this was not much protection was shown afterwards by a very slight yellowing of the whites and high lights following the spaces between the backing boards only. Only a short time since, the picture was taken out of the frame to clean it, when a heavy deposit was found on the inside of the glass, corresponding with the same spaces, showing that the damp must have passed right through mount, as well as picture, and condensed upon the glass.

On examining this picture closely and critically, the shadows and half-tones even in the partially affected area exhibit not the slightest change from the original purple-brown, and it is only in the lighter details of the stone work that the trifling yellowing can be detected. The sky, which is a clear one without clouds, shows a slight tint against the white mount, which is probably rather due to change of colour in the paper or the albumen than to any sulphuration, for, judging from the rest of the picture, there do not seem to be any of the elements of fading present.

This is an example of the resistant power of albumen prints when properly made, in spite of very trying circumstances, but I have other examples that have not suffered from similar adverse conditions, and which are practically as good as when freshly printed. I have two pictures, for instance, from collodio-albumen negatives, by Mr. James Mudd, of Manchester, which must be over thirty years old, which, *as photographs*, are as perfect as ever, though, as in the case of the one already mentioned, the paper or the albumen has become slightly yellow with age, though the yellowing is not visible in the slightest degree in the most delicate parts of the image.

Turning to prints of my own production, I can find samples of over thirty years old that are practically as fresh as when new, and others of a much later date that are palpably going, although I can safely say that the later prints were treated with at least as much care as the early ones. It is the fashion to blame this kind of result upon a gradual change in the character of the paper from strongly to lightly salted, to the adoption of a weak printing bath instead of a sixty or eighty grain one, or, perhaps, to the use of stale albumen instead of fresh; but, in my own case, for various reasons, I do not think any of these causes can be blamed for the reduced permanency of my later prints.

In the first place, some of the oldest and most perfectly preserved of these specimens date from a period, 1864-5, when I was using a

very thin and highly glazed sample of "Rives" paper, that perfumed the whole house as soon as it was opened, so that I scarcely think stale albumen is altogether to blame, though perhaps unpleasant. Then, as regards strength of bath, I never, until quite recent years, used anything less than sixty grains to the ounce; but, at one time, in 1868–9, with a special "highly salted" paper, I was using eighty and 100 grains to the ounce for some of my work. I happen to be able to identify one particular print—from a very thin negative—which, I think I may safely say, was printed with the strong bath, but that is badly faded, as are the majority of others done about the same time. I do not mean to say the strong bath did it, but that the strong bath is no preventive.

The real reason of the difference in my case, as in many others, is, no doubt, to be traced to the method of working. At the time these earlier pictures were done, I had not much spare time for printing, and always toned in small batches of, perhaps, at most half a dozen prints at a time, or, perhaps, it might be only one or two—for that was in the days when you could put your toning bath on one side and go back to it again at any time without any doubt as to its toning powers. Those few prints, however carelessly attended to, had their regulation period in water, and a certain number of changes, and got a fair or proper amount of washing. At the later period I speak of, I was toning sometimes 150 or 200 prints a day; and the inference is that, in spite of mechanical washing arrangements, they did *not* get fair and proper treatment.

Messrs. Haddon and Grundy's remarks as to the sufficiency of short washing, if properly performed, are fully in harmony with my own experience, and, I have not the least doubt, that of other old workers. I have often myself, and have known it done by others, when wanting to finish a print in a hurry, changed it quickly from one water to another, squeezing the moisture out of it between each change with a sponge or by rolling it with a glass rod. I have known a print finished off in that way to be perfectly unchanged after several years, although mounted within ten minutes of fixing.

I am quite of the same opinion as Mr. Haddon, that albumenised paper is worth reviving, for I think, if fairly treated, it offers better prospects of permanence than gelatine. At any rate, the fact that some albumen prints are capable of lasting thirty years or more proves that all have a chance if properly treated. There is one circumstance, however, that will be rather against albumenised paper at the present day, namely, that it will be of no use with half the negatives that are now turned out. W. B. Bolton.

IODATED SALT—A RAPID HYPO ELIMINATOR.

In the current number of the *Bulletin de la Société Française de Photographie* appears a paper by M. P. Mercier upon a new salt which he has introduced for the rapid elimination of hypo, and which quickly eliminates the hypo without in any way affecting even the most delicate silver image. It possesses the property of destroying the insoluble variety of silver hyposulphite, $AgS_2O_3NaS_2O_3$, which is formed by incomplete fixation, and which cannot be eliminated by copious washing.

Most of the eliminators which have been proposed have not been much used in practice, because some of them stain the proofs, as in the case of permanganate, or else they attack the image, like chlorine and the hypochlorites, or else they do not act sufficiently, as in the case of some of the persalts recently introduced.

The iodated salt is satisfactory from every point of view, as it permits of the total elimination of the hypo in the case of proofs insufficiently fixed, and this may be proved by touching the whites of the prints with a brush dipped in a ten per cent. solution of silver nitrate; there will be no yellow stain, proving the absence of hyposulphite.

The salt can be prepared by simply treating iodine with an alkali or alkaline salt, so that a colourless salt is obtained. With the alkaline carbonates or phosphates the decolouration is very slow, but it is immediate if ammonia is added little by little. Iodide of nitrogen is formed if ammonia be used, but this may be prevented by adding also a chloride as suggested below. Borates and sulphites may also be used instead of the carbonates or phosphates. In every case the iodine ought to be almost colourless before it is used, and in this condition it will eliminate the hypo without attacking the image at all. The non-decolourised solution will attack the image.

All that has been said with regard to iodine applies also to bromine, but the bromated alkalies eliminate the hyposulphites less rapidly than the iodates, and they must be absolutely colourless, for with the slightest tinge of yellowness a solution will attack the image very vigorously.

It is difficult to state exactly what are the various compounds in solutions of iodine and bromine thus formed. According to the researches of Schoenbein, Lenssen, and Lewenthal, they contain the hypoiodides, iodides and iodates, but the two latter separately have no action on the hyposulphites. There are probably formed intermediate compounds which have no action on the silver image, but act particularly on the hyposulphites.

The preparation of the iodated salt is tedious, disagreeable, and certainly more costly than to purchase it ready prepared. For those who wish to prepare it themselves the following method may be adopted: mix in a porcelain mortar—

Iodine	3 parts.
Salt	30 ,,

The iodine should be well rubbed down with the salt as this facilitates solution. A small quantity of potassium iodide will help it to dissolve, but it gives a reddish solution which decolourises very slowly. An alcoholic solution of iodine may be used, and this can be obtained from any chemist as tincture of iodine, and thirty-six parts will be required to equal the dry iodine. Then to the above mixture is added—

Carbonate of soda	30 parts,

and the whole well mixed together; it should then be dissolved in 1000 parts of water, and it may be used after twenty-four hours, or, if wanted in a great hurry, it may be gently heated on a water bath or decolourised by adding ammonia drop by drop.

A solution containing two per cent. of the salt may be exposed for a very long time to the air without undergoing any change, and a quart of it is sufficient for about twenty 7×5 plates, and when of this strength it requires for the total elimination of the hypo at least half an hour for negatives and positives on glass, five minutes for salted paper, ten minutes for bromide paper, fifteen minutes for albumenised paper, and one hour for gelatino-chloride paper. The prints may be left for a long time in the bath, or the proportion of iodated salt may be increased without inconvenience; the image will not be attacked. The proportion of salt may be reduced for salted and bromide papers when the time of immersion is increased.

The negatives or prints should be rinsed for five minutes when taken from the fixing bath to remove the excess of hypo and then placed in eliminator and the dish rocked from time to time. It is advisable, when the bath has been used for some time, to use a second and new bath. The prints and plates should, after treatment, be rinsed for some minutes in water.

With imperfectly fixed prints an immersion of ten minutes in the iodate bath will eliminate more hypo than washing for ten hours in running water.

THE PARIS PHOTOGRAPHIC SALON OF 1897.*

I.

The English exhibits at the Photographic Salon are numerous and interesting. If there is not to be found this year any new man of prominence, or any particularly striking effects from the point of view of audacity or originality, we are able, on the other hand, to admire a persistence of effort towards the expression of the beautiful, an absence of the commonplace, an artistic capacity, in fact, which proves that pictorial photography in England, although the distance which separates it from the foreign schools has sensibly diminished of late years, is still able to hold its place at the head of the artistic movement.

Misty landscapes, with striking sky effects, reeds and rushes in the foregrounds, or low tides on marshy estuaries, are again much to the front, and very well treated, it must be admitted. Can this preponderance of a special effect be due to the influence of a master of this style—Mr. Horsley Hinton—or are we to attribute it to the relative facility which is given by the choice of a subject which is, in nature, almost as monochromatic as it is in the photographic print itself? To explain this preponderance by the character of the climate of England would be a concession to Continental prejudices, for, London apart, the sun shines little less over there than here. Overwhelmed by the numbers in which it has previously appeared, the seascape seems to have given up almost completely; on the other hand, if the "derelicts" still show signs of resistance, they also will, no doubt, follow the example of their elders. In portraiture, English art preserves its own particular character; the

* Translated from the *Bulletin du Photo-Club de Paris.*

examples shown, unhappily small in number, are excellent. Groups, however, or subjects involving several figures—a style which several French exhibitors affect to advantage—are scarcely to be seen at all.

The division of photographers into portraitists and landscapists appears to me to be a very arbitrary one. Such specialisations are certainly too infrequent to allow of any classification of the kind. I propose, therefore, to run through the work of the Salon as chance may take me, in a walk round the gallery, without troubling to erect barriers round the authors of the works exhibited, which may perhaps, at the very next Exhibition, be completely overthrown.

Mr. Davison sends us nine landscapes and a portrait. These ten examples are in no way inferior to the work by the same artist which we have been enabled to see at our previous Exhibitions. The tonality which Mr. Davison adopts is somewhat placid; his effects are, therefore, peculiar, keeping always in the key of the middle tones without ascending to the vibrating and extreme notes either of white or black. No. 173 is particularly remarkable. Mr. Davison, without going beyond the limited key which he affects, produces, nevertheless, a very powerful illusion in the pile which starts from the water in the foreground, and is thrown into opposition of values with the lighter portion of the river placed behind it; this, although far from high in tone, gives all the same a marked impression, on account of the very opposition to which we have alluded.

No. 174 (Charing Cross Bridge) gives well the idea expressed by the title *Rain, Steam, and Fog*. The effect is striking; but, in the face of a picture of such remarkable truth to nature, one cannot help regretting the exaggerated perspective of the balustrades on the right and left, which betray too much the influence of the wide-angled lens which produced it. We must notice also No. 177, a charming landscape, in which a powerful effect is produced by the concentration of light on the figure of the cow passing through the gate. In No. 181, *Reflections*, Mr. Davison's art has failed to diminish the troublesome proportion of the barrier in the foreground, which attracts the attention more even than the reflections on the left hand of the picture. No. 175, *From a Landing-stage*, conceived in a similar order of ideas, is in every way excellent, the values of the sombre hull against the diffused effect of the masts in the background are exquisite, the cleverly managed concentration of light accentuates (as in No. 177) still more the general effect. It is a picture of peculiar charm and truth of expression. No. 179, *The Oat Harvest*, in the same key, succeeds, nevertheless, in giving us an impression of a hot and brilliant atmosphere. The *Lake*, *Low Water*, and the *Canal* are, again, excellent examples of Mr. Davison's talent in landscape. As a portraitist his cleverness is shown in No. 182. The head, in full light, is something between sharpness and diffusion of focus. The flesh tones are true in texture, the value of the white shirt collar is perfect, the cloth of the coat is cleverly absorbed in half-tone, and thus does not unduly attract attention, the general expression is remarkably lifelike. Take it all in all, Mr. Davison's collection is one of those whose study should be of the greatest utility to the French amateur.

Mrs. Jeanie Welford's four prints resemble each other. Three of them seem to have been taken one after the other, at a rapid sitting. One finds in them a strong kind of effect, where nature, one would think, would have given a soft and warm light. The transcription is not a happy one. No. 558 is pretty, but why such an irritating centering of the principal figure? One may note, *en passant*, Mr. Dean's two prints, which suggest no idea of original research. Mr. Brooks Thornley sends us from Australia an interesting lamp effect (*Fin du Roman*). The exuberance of the palms is somewhat troublesome, but the pensive expression of the girl, the position, hesitating, as it were, of the hand, are charming, and agree well with the title of the picture.

Studies of the nude in the open air are rare in the Exhibition. Mr. Langfield shows three delicate examples. In *Œnone* and *The Garden of Proserpine* he has boldly posed his model against the branches of a shrubbery in a frame of foliage, through which some beams of sunlight pass, leaving here and there luminous spots of soft light to remain on the bust and on the flanks of the figure. The photographic hardness of the foliage is cleverly softened, the contrast with the flesh tones is not too violent, the pose of the figure is charming, the drapery graceful—in fine, it is a very successful effort. No. 330 (*A Young Greek*) sins only by the too realistic perspective of the leg, which stretches forward towards the spectator on the grass of the foreground. The size of the foot is still more accentuated by the ray of sunlight which delineates it. The figure is, however, delightful in its youthful form, the pose of the left arm cleverly arranged, the masses of light and shade in the background perfectly balanced. Mr. Langfield may be congratulated on his success in a line which is a difficult one from every point of view.

Mr. Maskell, whose pictures last year attracted many and disconcerted others, both by his tendencies and by his manner of working, sends us two frames only, as one might say, simply as his *carte-de-visite*. The two prints, in sanguine (photo-aquatint), represent a young girl in half-length, and a head in three-quarter face. After having captivated our attention by the boldness and originality of his previous manner, he has been content this time to charm us by a simplicity of pose and treatment.

Mr. Lyonel Clark, in four subjects, shows us very different effects, treated in a decidedly personal manner. No. 121 (head of an old lady) seems inferior to others: the shadows are buried, the lace of the collar forms a white and uniform spot. The shadows, on the contrary, in the landscape (No. 123) are superb and the composition very original; the sky, in which the clouds are grouped near the horizon, relieves us, purposely as one may say, from the stormy effects with which we have been too often treated since now some time. The *Landscape in Constable's Country* is a fine effect of colour, which recalls most happily the work of the master. A very interesting effort is (No. 120), *A Sketch*, a head of a young girl, lifelike in expression, diffused in focus without carrying this to exaggeration, altogether original and most artistic.

Mr. Bland's three prints are pretty without being remarkable; No. 58, especially, *Monument in Kedleston Church*, is of a purely architectural character, which would require the introduction of an appropriate figure, or a special effect of lighting to raise it above the position of a simple documentary print.

Two very graceful studies of young girls in the open air by Mr. Manly. The pose of (No. 376) *Aurora*, is delightful, although the hand, rendered rather heavy by the mitten, loses some of its delicacy. This brilliant print gives well the impression of bright sunshine; still, by the use, or abuse, of pure white paper, it gives it to us somewhat brutally, instead of simply suggesting it, by the opposition of a quiet tonality to a simply higher note, leaving the half-tone to remain in the presence of the maximum high light. The study (No. 377) *Gloriana*, is much more harmonious; there is no want of texture, as in its neighbour, the foreshortening of the left hand is not very happy, but the youth and freshness of the model, the aureola of the blonde hair, and the delicate modelling of the figure posed against the light are given in a very charming manner.

Mr. Lewis Cohen's speciality is of the laughing order. The example which he sends us is graceful, and the grimacing photographic grin has been carefully avoided. The white spots in the background are particularly well placed.

Of Mr. Mainwaring's two prints we find first, in No. 381, the classic mist effect unrelieved by the slightest note of originality. In No. 380, on the contrary, the general effect is new, in spite of the triviality of the subject. The attitude of the mower is forcible, the mackerel sky is well in keeping with the values of the landscape.

Mr. Martin's two proofs have particularly attracted attention. The night effect has been accused of falsity, and the lighting attributed to brush work. In point of fact, the public, brought in presence of new results produced by photography, has shown itself, as it always does, to be incredulous, waiting the while until the time arrives when it becomes sick and tired of them. All the same, Mr. Martin's negatives were taken after nightfall, or rather, to be more exact, the exposure, begun in the last gleams of light in order to give the strong outlines of the subject, has been finished in complete obscurity. To the first part of the exposure we owe the depth of the sky and the very delicate relative values of the shadows. Halation has been avoided by the ordinary precautions. Mr. Martin has chosen a rainy day in order to avail himself of the luminous reflections given by the puddles of water on the pavements. The result is extremely interesting, if it is not altogether satisfying. The reason may perhaps be found in the want of diffusion in the light of the gas lamps, which hardly seem to be the source of light which we find reflected elsewhere. It appears to me that, if Mr. Martin had not so completely got rid of halation, if, in fact, he had given us the impression of the luminous rays, which our eyes, by an optical illusion, see radiating around every brilliant source of light, his nocturnes, curious as they already are, would have been altogether more striking.

Two subjects, delicate in tone, by Mr. James. The first, hung without malicious intention next to Mr. Martin's, entitled *Summer Night*, gives the impression of a night which is singularly luminous in comparison with those of London. The other, *Scotland's Flower*, is pretty, without being remarkably clever in composition. Mr. Warren shows us a fine effect at low tide. His picture is saved from the monotony peculiar to this class of subject by the cleverly arranged lines of the pools of water and the graduated harmony of the values, starting from the foreground till they lose themselves at the horizon. The sky is charming.

Mr. Hollyer has sent two examples only of his fine work, and we can but regret this. The portrait of Mr. Gleeson White, whose courteous and interesting criticisms many French exhibitors have undergone in London, is marked by a sobriety of composition and of treatment which should serve as an example to every photographer. No. 203, *Portrait en chapeau*, a long panel picture, is very interesting in its originality of pose. Mr. Hollyer has succeeded in rendering supportable the hideous modern costume, complete from head to foot, even to the chimney-pot hat that we always find so immovably fixed on the heads of our British neighbours. The figure, turned towards the spectator, holds the handle of a door which it had just opened. And here I may permit myself a slight criticism of detail. Would not the effect have been more harmonious if the streak of light which streams through the opening of the door had been less uniform? We get the effect of a pure white margin, the door opens upon nothing. The head is extraordinarily lifelike, and the values of the flesh tones against the shirt collar, that redoubtable neighbour, are perfectly just and true. Mr. Hollyer has succeeded in this *tour de force*, as he seems to succeed in all that he undertakes.

Mr. Cameron also shows portraits only. That of Master Jimmie Marshall is charming; very simple and lifelike. The portrait of Watts is equally interesting, at least, in the upper part, for two-thirds of the picture are made up of a minute reproduction of the home-spun waistcoat of the sitter. Not much attempted in No. 110, *Violet*. Another portrait is by Mr. Knight-Bruce, a lovely head of a child, in delicate grey tones, much diffusion, and poetical in feeling. But why that large green spot on the left shoulder?

The *Quay*, by Mr. Bennett, is fine in colouration, and a good composition, but we feel upset by a fuzziness pushed so far as to destroy texture, to such a point, in fact, as to render it impossible to discern the exact nature of the foreground. The *Fog Effect* (No. 30) is charming, and in the *Telegraph Post* Mr. Bennett gives us very truthfully the impression of the most absolute dreariness and desolation; and I assert that this post, which many people considered to be ridiculous, is necessary to this effect, and that it accentuates it to a degree that the public of which I speak has not for a moment suspected.

Three landscapes and a view of the cathedral at Dordrecht, by Mr. Karl Greger, may take rank amongst the best pictures in the Exhibition. Mr. Greger's style is studied, quiet, and perfect in delicacy; his (No. 252) *On the Beach* is of a charming truthfulness of soft grey tonality; in (No. 253) *Afterglow*, he has succeeded in giving us a very truthful impression of the rushing waters of a mountain torrent, thanks to the diffused focus of the eddies in the foreground which are not frozen up as in so many subjects of a similar nature. *A Woodland Idyll*, charming in sentiment and colour suggestion, would perhaps have gained by a little severity in cutting down; the right-hand side is wanting in interest.

ROBERT DEMACHY.

PRINTS IN TURNBULL'S BLUE.*

BESIDES the use of coloured pencils on the finished print, I should not omit to mention that retouching may be done, before toning, with Paris blue or Turnbull's blue. The colour may be obtained by adding one part of red prussiate of potash to 1·26 parts of sulphate of iron.

It is also possible to change the blue colour to purple brown. For this purpose freshly developed prints must be taken and immersed for a few minutes in a five to eight per cent. hot solution of tannin, to which has been added a trace of pyrogallic acid. As soon as the picture begins to turn lilac it may be taken out. It is then rinsed and immersed in a one to two per cent. solution of caustic soda, which will at once turn it purple-brown. Unfortunately, I have been unable to obtain pure whites, and even with the quickest possible manipulation they retain a tinge of rose. With suitable subjects, fine effects can be obtained. The process will be acceptable for reproducing engravings, &c.

The specimens of colour modification that I have obtained may be classified somewhat as follows:—

A. Shortest cold lead bath, alone = azure blue or blue lilac.

B. Shortest cold lead bath followed by sulphocyanide = grey lilac, reddish.

C. Hot lead bath = lilac.

D. Hot lead bath, followed by sulphocyanide = lilac, reddish.

E. Sulphocyanide bath, alone = moss green, pale to dark.

* Concluded from page 460.

F. Sulphocyanide bath with lead = green black, violet black.

G. Tannin-caustic soda bath = purple brown, paler.

H. Tannin-pyro-caustic soda bath = purple brown, darker.

The processes are well known by which blue prints may be changed to black, either as ink or silver prints.

Of the ink processes I would recommend the following:—The blue prints are immersed in a five per cent. bath of carbonate of soda (or dilute potash lye) until they turn a pale yellow colour; after slightly rinsing they are toned in a bath of 4 grammes of gallic acid to 500 c. c. water, to which is added one-third gramme of pyrogallic acid. They are then washed. Gallic acid alone tones violet only, and, proportionate to the amount of pyrogallic acid in the bath, the tones vary from violet to lilac to black.

A combined bath of soda and tannin has also been used. The soda decomposes the Turnbull's blue and precipitates ferric hydroxide, which is converted to ferric tannate by the tannin.

Black silver prints are obtained by floating well-washed blue prints on a one to two per cent. solution of silver nitrate. The Turnbull's blue is changed to ferricyanide of silver, and the iron to basic nitrate of iron, and the image disappears. After the nitrate of iron and excess of silver nitrate have been removed by washing, the prints are fumed for a short time with ammonia, exposed to light, and finally treated with oxalate of iron developer, that is to say, the ferricyanide of silver is reduced to metallic silver. But other direct printing methods will be preferred to both these black processes, on account of their complexity.

To complete this account, I would like to add the following formula given by others for the preparation of solutions for the blue process. I have a large collection. The chief point is that the ferric salt shall always be present in excess, as the precipitate then only is insoluble. If the red prussiate is in excess, a soluble compound is produced, which for this purpose is useless.

Feuerbach recommends: A, 10 grammes red prussiate of potash in 32 grammes of water; B, 15 grammes ammonio-nitrate of iron in 32 grammes of water. A and B to be mixed and filtered.

Schnauss: 78 parts of chloride of iron, 71 parts of ammonium oxalate, 73 parts of red prussiate of potash, to be dissolved in a suitable quantity of water.

Vogel: A, 10 grammes of red prussiate of potash in 100 grammes of water; B, 10 grammes of ferric potassium oxalate in 100 grammes of water, &c.

Watt recommends the addition of a small quantity of boracic acid to the solution to increase its keeping quality: A, 96 grammes of ammonio-citrate of iron, and 1 gramme of boracic acid to 190 grammes of water; B, 90 grammes of red prussiate of potash in 190 grammes of water. For use, take equal quantities of both and mix.

The following is another method: A, 6 grammes of red prussiate of potash in 50 grammes of water; B, 9 grammes of ammonio-citrate of iron in 50 grammes of water. Mix A and B together. The paper is first wetted and the surface then dried between filter paper. The prints must be vigorous and show bronziness in the shadows. They are quickly dipped in water and transferred to a bath of about 3 drops of ammonia to 100 grammes of water, in which they turn violet and then bleach. Lastly, they are immersed in a six per cent. solution of sulphate of iron, in which they turn a blue-black colour.

A well-prepared blue print, upon good paper, with pure chemicals, is full of vigour, with detail in the shadows. The colour is brilliant blue, with lustrous coppery shadows and a pure white ground. If neatly trimmed and well mounted on plate-sunk mounts, which I specially recommend for the purpose, they may almost be taken for photogravures, especially if the character of the picture is dark and vigorous, with deep shadows. The blue colour will be found most suitable for marine subjects and moonlight effects.

In conclusion, I would mention a few other applications where prints in Turnbull's blue may be used with effect, and which may be of interest to those to whom they specially appeal. Their fine vigorous colour makes them valuable for transparencies, and for this purpose they should be saturated with paraffin. Instead of paper, good canvas may be used as a support for painting, &c. In this case it is desirable to first stiffen the canvas with a warm one per cent. solution of gelatine and to flatten it after drying, although neither may be a necessity. Lastly, the similarity of the colour to that of the old Delft pictures may be utilised for imitating tiles if suitable subjects are selected. For this purpose the prints should be stuck upon a hard, smooth surface, such as glass, and then coated with Dammar varnish. The imitation of the glaze is still more complete if the plates are coated several times with gelatine before varnishing. Oak is very suitable for the frames.

OSCAR BOLLE.

THE OPTICAL EFFECTS OF INTENSIFICATION.*

Ammonia.

I have not yet worked out the exact chemical changes that take place when ammonia is used to blacken the whitened image, but I have certainly proved that the change is not uniform. This want of uniformity is amply confirmed by the optical method of examination. The following table shows the multipliers of the opacity logarithms obtained in four series of experiments, the opacity logarithms of the original plates ranging from ·14 to 1·49 :—

Same strength of dilute ammonia	1 minute	1·0	1·0	1·0	1·23	1·33	1·62	1·68	1·62
	15 minutes	1·0	1·0	1·07	1·24	1·33	1·46	1·43	1·37
Same time of application	weak ...	1·0	1·33	1·38	1·35	1·46	1·48	1·53	1·54
	strong ...	1·0	1·0	1·04	1·21	1·30	1·35	1·39	1·40

The figures show unmistakably that the action is uncertain, that there is a reducing or thinning action as well as an intensification, and that this thinning of the image increases as the time of application or the strength of the ammonia increases. I pointed out many years ago that a reducing or thinning action of this direct character could not be proportional in its effects, and this was afterwards confirmed by Messrs. Hurter & Driffield. An intensifier that reduces as well as intensifies is generally called "clean working," but such cleanliness is no recommendation in negatives of half-tone subjects, especially as one can never know now much of it he is going to get.

Silver Potassium Cyanide.

This is another "clean working" reagent and consequently uncertain and uncontrollable. It is obvious from the following figures (multipliers of the opacity logarithms) that prolonging its action tends to reduce the density, but the same effect is not reproducible except by accident. The effect is irregular, and the chemical changes that take place, and have already been described, make it impossible to hope that it can ever be otherwise. It may be added that the images resulting from the use of this reagent, and also from ammonia, are liable to subsequent change. Probably they never remain without change.

Treatment.								
Short	1·12	1·26	1·51	1·62	1·70	1·71	1·74	1·71
Long	1·00	1·17	1·32	1·34	1·40	1·44	1·41	1·42
Short	1·43	1·70	1·72	1·77	1·91	2·06	2·16	2·04
Long	1·43	1·65	1·65	1·68	1·56	1·76	1·79	1·77

Messrs. Hurter & Driffield, in their original paper, read before the Society of Chemical Industry in May, 1890, describe the results of two experiments with this intensifier, and their results tend to confirm what I have stated, although they infer from their experiments that the ratio of the opacity logarithms is not altered. The range of density that they dealt with was too small to show the variation, but the average multiplier obtained in the two experiments is different, 1·95 and 1·82, although it is probable that they did not of set purpose vary the treatment. The opacity logarithms of the original plates in my experiments ranged from ·16 to 1·44 in the first pair of experiments, and from ·07 to 1·31 in the second.

It follows from these results that, if it is desired to intensify the negative of a black-and-white subject, to make the one part dense and keep the other parts clear, and if the negative is not to be preserved for longer, say, than perhaps a few weeks or a few months, the mercury and ammonia, and the mercury and silver-cyanide methods are exactly suitable. For keeping the clear parts clear, ammonia is especially to be recommended, as it does not intensify the thinnest part of the negative at all (or it intensifies and then reduces them), and in some cases I have observed that the thinnest parts have finally been, if anything, rather reduced in density than otherwise by the operation. But examination of the same plates a year later showed, without doubt, that the thinnest parts had spontaneously increased in density.

It is rather risky for a mere investigator to offer advice to practical people on points that they have almost hourly experience with; but, if a photo-mechanical worker with gelatine plates asked my advice as to the intensification of black-and-white negatives, I should unhesitatingly advise mercury and ammonia rather than the silver-cyanide, or any other method; but it must be ever remembered that the resulting image is liable to after-changes.

* Concluded from page 458.

Sodium Sulphite.

I have previously, from the results of the chemical changes produced by this intensifier, advised it as safe, though of little use, because the increase of density that it gives is so small. I find, however that it is not safe, that it alters the ratio of the opacity logarithms, and the chemistry of its action shows how this is, though alone it would not have justified the condemnation of the method.

The following figures are the average of two experiments on plates with opacity logarithms ranging from ·15 to 1·51, and are, as before, the multipliers of the logarithms :—

1·0 1·0 1·10 1·14 1·18 1·21 1·19 1·17.

Here, as with ammonia and potassium silver cyanide, there is a marked reducing, as well as an intensifying action, which leads to no increase of density in the thinner parts, and an increasing increase towards the denser parts. The ratio of the opacity logarithms is quite altered.

The effect of this intensifier is to replace half the silver of the image with rather less than an equal weight of mercury (216 to 200), and as the specific gravity of mercury is greater than that of silver, and there is contraction when mercury and silver combine, the total bulk of the resulting matter that forms the image must be considerably less than that in the original plate. It is curious, therefore, that there should be any increase of opacity at all, and it must apparently be due to a change in the disposition of the particles. This may be the cause of there being no increase of opacity in the lower densities, the disposition of the particles being different there.

But I have shown in previous communications that the sodium-sulphite solution, which contains half the silver of the original image, when left in contact with the solid product of the reaction, causes a partial solution of the mercury and disposition of silver instead of it. Now, as the exchange of silver for mercury has increased density, it is not surprising that a change back again of some of the mercury for silver should give a diminution of density. I fear, therefore, that this reagent, like the ammonia and silver potassium cyanide, causes a reduction of density after the intensification effect, and is, like them, unreliable and uncertain.

The results of these methods of intensification have been plotted as curves for their more ready comparison. The densities of the original plates were not in all cases quite identical, but there was not much difference, and the results have, for the purposes of these curves, been proportionally adjusted to make them all comparable together.

Chapman Jones, F.I.C., F.C.S.

PHOTOGRAPHIC SURVEYS.

[Paper read before the Royal Photographic Society.]

The value of the exact and permanent records acquired by photographic surveys has been so thoroughly established by various writers and workers during the last few years that it is quite unnecessary to make any further attempt to justify the formation of associations for their production.

We are at present more concerned with the systematic organization of the respective bodies who have taken up such work or are contemplating participation in the scheme. It is, I think, of vital importance that, in what promises to become one of the greatest achievements of photographic art, something like uniformity of results should be aimed at, and any society which purposes undertaking even a small local survey should therefore make itself acquainted with what has been done elsewhere. Possibly it is for this reason that I have been asked to tell you something of the Warwickshire Photographic Survey, which has now been in operation some seven years.

Whoever may have been the originator of the suggestion, there is no doubt that the credit for reducing the scheme for a County Survey to a practical and workable shape is due to Mr. W. J. Harrison, F.G.S., who in December, 1889, read a paper on "A Proposed Photographic Survey of Warwickshire," before a specially convened meeting of the Birmingham Photographic Society, of which he was a Vice-President. The ideas he then formulated constituted the basis of the scheme, and from which various rules and regulations have since been elaborated.

Previous efforts had, I believe, been confined to the illustration of a district merely—not a county—and the chief aim had been the production of lantern slides. The county was adopted as a unit for obvious reasons. The geographical boundary is easily defined, and the division

into "hundreds" is a still further convenience. The alternative suggestion of, say, a twenty miles radius of Birmingham would have included portions of some half-dozen counties, and, if the circle plan were followed by other towns, great gaps would be left in the margins. No such fault can, of course, be found with a county boundary.

Years of working have naturally shown the weak places in the system, or the want of it, and enabled us to adopt means of correcting our errors. As a preliminary of the utmost importance, I would impress upon survey societies the absolute necessity of organizing and conducting their affairs in a businesslike, methodical, and accurate manner, and of appointing responsible officers who are known to possess qualities of this nature. However desirable this may be in ordinary society routine, it is not only inconsistent, but positively ludicrous, that an association, which has for its primary object the production of records for the benefit of posterity, should carry on its work in a slipshod, erratic way that will not bear investigation. It is also desirable to have a few men at the head of affairs whose well-directed energy will keep all in motion, and so act as the key to the success of the undertaking.

A Survey Section of the Birmingham Photographic Society was formed to carry out the details of the scheme mentioned, and the co-operation of various scientific, literary, and artistic societies was invited. The services of their members, while not appearing so much on the surface, has been of a very valuable nature.

The ordinary amateur photographer has frequently more enthusiasm than knowledge of the special kind requisite for this purpose, and a partnership with, say, architect, archæologist, or historian, will often produce results of an instructive character. This, again, may lead to our becoming students as well as photographers, certainly one great good arising from the task.

How to Conduct a Survey.

The method of working may be considered as requiring careful regulation. We have adopted the 6-inch scale ordnance map as a basis of subdivision, and the lines of the hundreds for larger boundaries; Warwickshire consisting of the hundreds of Hemlingford, Barlichway, Kineton, and Knightlow, with the city and county of Coventry. Each square of the map, containing roughly six square miles, is regarded as a distinct field for one or two workers, and may be allotted by selection or ballot an allotted square being withdrawn if no work is done in a reasonable time.

The systematic continuation of this arrangement would, as may be easily seen, quickly lead to a completion of the scheme, but it is difficult, in fact, almost impossible, to induce a member to concentrate his attention to the district in a particular square, especially if it should, as many do, contain more or less uninviting objects.

The natural aptitude of the individual for a certain style must be recognised, and as all the work is voluntary from first to last, in regard to both time and expenditure, it is but reasonable that he should be able to choose his own ground. A distinct objection, however, must be raised against the sort of "dog-in-the-manger" plan, by which one man (perhaps with a view to medals) carefully skims the most attractive features of a district and leaves the less pictorial portions for others. The man with a special subject or hobby is generally to be encouraged, although he does not always prove the most helpful. For instance, he may decide to take one or perhaps two photos of every church in the county—no light task—but, as the attractions of very few churches indeed may be exhausted by a couple of pictures, I think it would be better to confine the attention to one, and secure a representative series of that one before rushing on to others. It may be said that the church enthusiast will ultimately complete the work he has begun, but this, I am afraid, will rarely happen. It will be found that he will rather take up another subject, or—accidents will happen—he may unearth a grievance with the officials and retire altogether, when, in either case, it is probable that nothing more at those churches will be attempted by others, who would say, "Oh, So-and-So has done those."

The opposite view is that of the pushing member who stays at the hall for a week and photographs every nook and corner of the establishment, with the family of his host, the dogs, cows, horses, and pigs, and sends in some fifty views of a place that may be well represented by half a dozen.

Excellent, therefore, as the system of subdivision of districts, with a gradual completion in progressive order, may appear on paper, in practice it is found impossible to adhere to, and the better plan is to accept everything offered, even if a judicious weeding out has to be effected.

Ordinary society excursions may be utilised to obtain pictures, although care should be taken to avoid duplicating. It would be well for a few members to apportion the different views of the object or objects amongst them, and thus secure a good illustrative collection.

Attractive as architectural subjects always are to the photographer, I think greater attention should be paid to the manners and customs of the people, especially in villages and country towns. School boards and parish councils are rapidly revolutionising the quaint habits and occupations of rural populations, and unless the opportunity of portraying them is quickly seized, it will be lost for ever. We are, in fact, making history at a high rate of speed, and should provide illustrations of contemporary life taken on the spot, instead of leaving them to be filled in afterwards by the imagination.

The trouble and annoyance to which the operator with a whole-plate camera is frequently subjected in the streets of large towns may account for the little work of this kind sent in. There seems, in fact, some danger of the towns being neglected altogether. Our busy thoroughfares are often the scenes of incidents of which an accurate record would be invaluable, and, in order to secure some of these, I would recommend the careful use of a hand camera, the negatives being afterwards enlarged to whole-plate size. This would give us a number of pictures difficult, if not impossible, to obtain in the usual way.

The current year promises such a wealth of incidents which will become historical that it behoves us to make special efforts to secure accurate representations. A Birmingham newspaper, in commenting upon the Survey at its institution, facetiously suggested that it might be good policy to commence by photographing some of the very modern erections of the jerry builder, as being less likely to withstand the effects of time and the elements than the nobler structures which have been objects of admiration for centuries!

The granting of permits to photograph on behalf of the Survey should be distributed with great care. In fact, it seems advisable for permission to visit certain places to be officially obtained as required rather than a standing authority be given to an individual who may use it in a manner prejudicial to the interests of the Survey.

The 6-inch maps mentioned, while useful for reference (the plans of buildings and indeed every tree being clearly depicted), are too cumbersome to carry about, the one-inch being more serviceable in this respect. There are, for instance, nearly 200 of 6-inch maps for Warwickshire against sixteen of the smaller ones. If a complete list of objects of interest is made from the 6-inch map, or the parish map of twenty-five inches to the mile, with the assistance of a local history and guide, the smaller map will be sufficient for all purposes of identification. A convenient method of using these maps is to cut each sheet in half-a-dozen sections and mount them on strong black calico, when they can be folded up in a small compass, and several may be carried in the pocket without being bulky.

With regard to county histories and books of reference, it is perhaps too much to ask that a society undertaking a survey should purchase copies, even if they could obtain all of them, but a list of books on the subjects contained in the local libraries might be hung in the club rooms, and as much information as possible be given as to the means of procuring cheap and modern guides.

Survey Prints.

The standard size of the pictures is the popular whole-plate, although prints of other dimensions are not refused. The mounts are made to take one whole-plate or 10×8, two half-plates or four quarters. This one, which I hand round, consists of a light buff mount with a cut-out portion of grey granulated board over. These colours suit the prints and will bear handling with little sign of wear. The cut-out form should always be adopted as the best means of preventing rubbing during examination and storage, and the top and bottom boards should be of equal size. This one is 14×11 outside, the cut out being $9\frac{1}{4} \times 7\frac{1}{2}$ for whole-plates. The aperture may be varied for other sizes. The mount has been copied by several other societies. The back has spaces for the following particulars: Subject; date; time; focus of lens; printing process and paper; remarks; contributor; address.

Perhaps it would be preferable to have this information on a separate form, which could be filled in by the contributor and afterwards attached to the mount. One, two, or four labels could then be affixed to correspond with the number of prints.

It is well to include a brief and accurate descriptive account of any item of information calculated to add to the value of the print, and to make the title as comprehensive as possible.

The cost of these mounts is 2*s*. 6*d*. per dozen, or, including trimming and mounting, 3*s*. This is borne by the city authorities.

The permanency of the printing process should, of course, be unques-

tionable. The majority of those hitherto accepted have been in platinotype, the more recent work being in carbon. Developed bromide prints may be acceptable, but all gelatino-chloride, albumen, and all P.O.P. prints should be rejected. A great incentive to work is an exhibition of the pictures before finally disposing of them.

The Birmingham Society usually displays the year's contribution at its Annual Spring Exhibition, when the pictures of each member are hung together, all being uniformly mounted and framed. The 500 frames available are of one-inch oak mouldings with detachable backs, and are the property of the Survey. Prints are handed to the Curator at any time during the year, and he superintends the mounting, &c. Exhibitions have also been given by the city authorities in the Art Gallery of pictures handed to them.

The disposition of the prints after production is a matter for serious consideration, and it is, I think, conceded that the municipal authorities of the principal centres of population are the most suitable custodians.

Birmingham has an excellent reference library, where we have deposited upwards of 1800 pictures, 1000 of these as a first contribution being given at the end of two years. This large number, of course, included prints from negatives already in hand, and did not represent the work of that period. The pictures have been bound together in books containing twenty-five to thirty boards, and may be inspected by the public during the usual hours. An alphabetical index is compiled as the prints are added.

While the pictures are as far as possible classified by our Curator before being handed to the library, there are of necessity others from the same districts sent in year by year; therefore it does not seem advisable to immediately carry out the binding operation. I incline to favour a box or pigeonhole classification, which might be added to as required for a number of years before finally binding.

A complete catalogue with copious index will be found useful, and a copy should always be hung in the Society's rooms, to enable members to see what has been done and to prevent duplicating.

As regards the botanical and geological aspect, such pictures should, I think, be kept separately from the general collection and each form a series of its own, with scientific classification.

I do not think a society should be content to deposit just one print from a negative in the city, but should have, say, at least three prints made—one for its own use, one for the central library, and one for the British Museum.

This brings us to the greater scheme for a national survey. I may here give you the rules of the Warwickshire Survey, which have just been revised.

RULES OF THE PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.

1. That this Association be called "The Photographic Survey of Warwickshire."

2. That the work of the Survey shall be to obtain records of all objects of interest in the county of Warwick, and to deposit such records with municipal or other authorities, where they may be safely stored, and be accessible to the public under proper regulations.

3. That the constitution of the Association shall be as follows: (*a*) Representatives of the photographic, scientific, literary, and artistic societies in the county, not exceeding five per cent. of their respective members. Each society shall pay an annual subscription of one guinea for every three or smaller number of representatives; (*b*) elected members, whose qualification shall be (1) a contribution of photographs to the number of six approved prints per annum; or (2) a subscription of not less than 10*s.* per annum; (*c*) Hon. Vice-Presidents, whose qualification shall be 1*l.* 1*s.* per annum. Voting for election to be by show of hands.

4. The business of the Survey shall be transacted by a Council, consisting of President, Hon. Secretary, Hon. Treasurer, and Hon. Curator, and five elected members, all of whom shall retire annually and be eligible for re-election.

5. Ordinary general meetings shall be held in January, July, and October. The meeting in January to be the annual meeting, when a report and a statement of accounts shall be submitted, and the Council be elected for the ensuing year.

6. The meetings of the Council shall be held in alternate calendar months, viz., January, March, May, July, September, and November, and at such special times as may be required.

7. Annual subscriptions shall be due on January 1.

8. The Council shall have power to fill up any vacancy in their own body, and to make by-laws, such by-laws to have the sanction of an ordinary meeting before coming into effect.

9. These rules shall be altered only at an annual meeting or a special general meeting called for the purpose. Notice of alteration to be given in writing to the Hon. Secretary before the date of such meeting.

It will be seen that the Association consists of society representatives, individual workers, and subscribers.

If a survey upon similar lines were organized in every county, it would be but a step further to form a "national" one, consisting of representatives from each county, with a London secretary, and the British Museum as a repository.

Our energetic President, Sir J. Benjamin Stone, M.P., who has taken a deep practical interest in the survey of our county, is now forming a committee to promote the national scheme, and has invited the leading societies to send representatives to discuss the details. He has presented 100 prints of Westminster Abbey from his own negatives to the British Museum as a nucleus, and there seems to be no reason why success should not crown his efforts.

It would, perhaps, be too much to expect or desire that a copy of each picture deposited with the local authorities should be sent to the British Museum, but a judicious selection of objects of general interest may be made from each collection.

Another feature should, I think, be included in this scheme for a vast store of photographs. It may be said, and with some degree of truth, that in a few years' time the hundreds of pictures lodged at the libraries will become buried and lost to view to all but the occasional patient searcher.

Why not take advantage of the popular educational value of the optical lantern, and make up sets of slides with well-written descriptive lectures, which could be enjoyed by thousands of people in every town and village in the country?

There are men in nearly every society who would willingly give their services in showing their less favoured neighbours pictorial presentments of their own or surrounding locality. The village parson or schoolmaster would have a large fund of information for his delighted audiences. Sets could also be exchanged with other counties, and the worried society Secretary, in search of items for his programme, would have an endless source of supply, which would gladden his heart and help to save that last wrinkle on the face, or tinge of grey in the hair, added with each year of office.

I strongly recommend the addition of the lantern slide to the other three copies from the negative, and am inclined to think there is even more scope in this method, as calculated to give greater pleasure to, and create deeper educational interest in, the larger number of the community.

Let us, then, make the most of these valuable photographic collections, and give every one a chance of seeing them in their most enjoyable form.

C. J. FOWLER.

ON THE ACTION EXERTED BY CERTAIN METALS AND OTHER SUBSTANCES ON A PHOTOGRAPHIC PLATE.*

A SECTION of a young larch tree gave a good picture, showing clearly the different rings and the layer of bark, which was the darkest part of the picture. The same section, when a film of gelatine was interposed between it and the plate, still gave a good picture. Wood which is thoroughly dried and hardened is also able to act in the same way.

A piece of mahogany 3·5 mm. thick, which had been in this form for at least thirty-five years, and been carefully preserved in a dark cupboard, gave, after a week's exposure, a good picture, and the bottom of an old cigar box acted equally well. Bodies such as straw, hay, bamboo, oiled silk, and, no doubt, many others, act in the same way. If wood, however, be painted with metal paraffin, it is no longer active. Ordinary charcoal also depicts itself on a photographic plate; but, if it be heated for some hours in a covered crucible, it loses this property. An ordinary piece of wood, if it be charred on one side by heating it with a Bunsen lamp, becomes remarkably active, as shown by placing it behind a screen with a pattern cut out. The action passes readily through different media, such as gelatine, tracing paper, &c., vegetable parchment, &c., and the structure of the charcoal is shown when the action has taken place, even through a sheet of vegetable parchment. Coal and coke, sulphur, sugar, on the other hand, exert no action of this kind. When trying whether a copy of a lithographic picture could be obtained by placing behind it a plate of zinc, some curious results occurred. It would seem that printer's ink, in most cases, is not capable of acting, like copal, on a photographic plate, but that there are many cases in which it is a remarkably active substance. Specially so is the ink used in printing many of the newspapers. The *Westminster Gazette*, for instance, is printed with an ink which very readily acts on a photographic plate. A portion of this paper, with printing on only one side, laid with the blank

* Concluded from page 439.

le on the photographic plate, in a few days gives a remarkably black id distinct picture. If there be printing on both sides, then two ctures are obtained, the darker printing becoming most evident on hichever side it may be. Interpose a sheet, for instance, of goldbeater's in, and still the picture is obtained. The *Standard* and *Daily Graphic* e also very active, and the *Times* only a little less so. The *Evening ews* is only slightly active, and the *Morning Post*, *Pall Mall*, *Echo*, and *ily News* have not the property of acting in this way; at least, those pies experimented with had not. An admission ticket to the Society of rts laid on a photographic plate, the ink away from the plate, also ve a very distinct picture.

Another singular case of an action of this kind was met with when experimenting with the uranium salts. Not having a sufficient number of nall, clear glass bottles for a certain set of experiments, one of the compounds, the black oxide, was placed in a pillbox, believing that the ction of the uranium would take place through the bottom of the box, nd on developing the plate a dark circular space where it had stood was isible. The experiment was therefore considered very satisfactory, and, ith different salts and for different objects, it was several times reeated. Ultimately it was forced upon one that the uranium salts acted nore strongly when in pillboxes than in any other way, and, on placing a illbox without any uranium salt in it on a photographic plate, it was ound that action had occurred, as shown by the dark circular space produced.

The experiment was repeated over and over again, with the result that nost pillboxes have the power of acting on a photographic plate. Both ew and old pillboxes from different sources were experimented with, nd almost all of them found to be active. There are, however, xceptions, and these, it was noticed, were always the more expensive nd elaborate boxes. On examining the structure of a pillbox, it as found that it is usually made of what is known as strawoard, covered with a thin white paper; on separately testing hese two materials, it was apparent that the white paper was ithout action on the plate, and that the strawboard was very active nd produced exactly similar effects to those produced by the active illboxes. The inactive ones proved to be made of white cardboard, hich is not an active substance. Samples of strawboard from several ifferent sources have been tried, and all found to be active, and when eparated from the photographic plate by means of screens, like the opal and the zinc, it gives a clear action. Different substances of a ke nature have been tried, such as brown papers, &c. Some of them re more or less active, but none more so than common strawboard. Ir. Bevan was good enough to examine a piece of this active strawboard, ut was unable to find any material other than straw present. Writing aper and, as mentioned before, white cardboard, have not this power f acting on a photographic plate, but many kinds of brown paper and o doubt many other bodies have the property. Many of the boxes in hich photographic plates are packed are made of strawboard, but, as he action does not pass through glass, the plates are but little or not at ll acted on; but, if a plate be laid face upwards in one of these boxes and eft there for a week, it will be very appreciably affected. If a small piece f glass be laid on the plate, it protects the film beneath, and shows clearly he amount of action which has occurred. If a box of this kind be painted nside with melted paraffin, this action does not take place. It happened hat a few months before making the above experiments others were in rogress in which black net was placed on a photographic plate simply to how clearly whether the plate had been acted on, and continually a eversed picture was obtained; this at the time could not be accounted or, but now the experiment was made of simply placing the black net on he photographic plate and leaving it there for some days; then, on levelopment, a clear picture of the net was produced. The action is due o some material in the black dye, for white net does not act in the same way.

The action of the vapour from a few liquids on a sensitive plate has been tried. The plate was placed about half an inch above the liquid, and a screen, with holes cut in it, was fastened against the plate. Methylated spirit acted slightly on the plate; pure alcohol and ether had no action; benzine, coal tar, crude wood spirit, linseed oil also had no action, but turpentine and oil of cloves produced a slight amount of action.

Such, in outline, is an account of the experiments which have already been made on this subject. One point has led on to another, and some of he results were so unexpected that the experiments had to be repeated nany times before full credence could be given to them. On the present occasion it is desired to do little more than record facts; further experiments, it is hoped, may lead to explanations not now evident. The supposition that all these active substances, the metals as well as organic bodies, give off a vapour capable of acting on a photographic plate, naturally suggests itself, and that copal does give off a vapour, which, directly or indirectly, is active, there can be no doubt. At the same time, it is at least difficult to suppose that the activity of such a body as strawboard should, after the treatment it has undergone, give off at ordinary temperatures sufficient vapour to produce the effects described, and the same applies to old dry wood, &c. Still more interest attaches to the action of the metals; do they emit a vapour so delicate in constitution and in such a quantity that it can readily permeate celluloid, gelatine, &c., and produce a picture of the surface from whence it came, or is it a form of energy (possibly what has been called dark light) that these bodies emit? Zinc kept and polished in the dark loses none of its activity. An experiment has been made with the object of reflecting the zinc action from glass. This did not succeed; whether this arose from the glass not being capable of effecting such a reflection, or whether a fortnight was not sufficient time to produce in this way a visible effect, is not known, but the experiment is being repeated. A photographic plate, suspended, film upwards, over a copal plate, was acted on round the edges in the way one would imagine a vapour to act. A similar experiment is being made over a zinc plate. The action of glass proves that there is at least a marked difference between the action exerted by metallic uranium and that by zinc and other metals.

It should be stated that it is only the most sensitive photographic plates which, without extremely long exposures, give the results described. The Mawson plate has generally been used in the foregoing experiments, but the Ilford special rapid plate acts equally well, and Edwards's isochromatic snap-shot plates are particularly sensitive to the action of the uranium salts. Lumière's extra rapid are not so sensitive as the Mawson and Ilford plates, and still less sensitive are the same firm's plates for yellow and green, and for red and yellow. Other sensitive plates have not been experimented with.

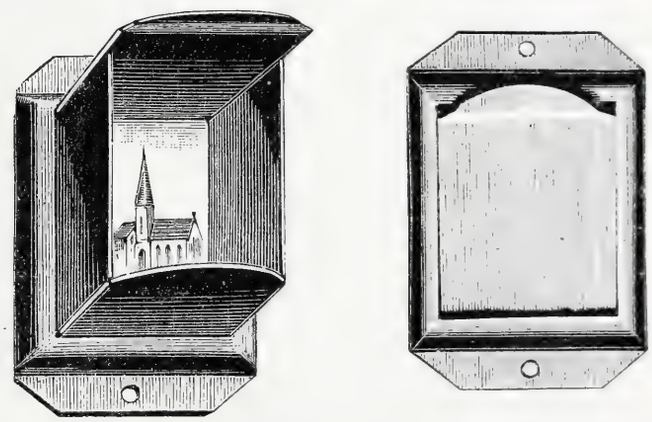
W. J. Russell, F.R.S.

Our Editorial Table.

The Birkbeck Finder Shade.

E. G. Platt, Birkbeck-road, Dalston, E.

The illustration depicts a useful adjunct to a finder, viz., a collapsible shade, which is shown open. When closed, by the mere raising of one flap the whole immediately springs up into a firm position. The



flap closes down flat by a slight pressure. For excluding extraneous light from the finder image this four-sided collapsible shade should be found of considerable service.

Photography in a Nutshell.

By "The Kernel." Iliffe & Son, 3, St. Bride-street, E.C. Price 1s.

A new edition of this useful little book, which we have noticed on many previous occasions, has just been published. Besides being revised and brought up to date, there is added a comprehensive chapter on Radiography by Dr. Hall-Edwards, who is a master of his subject. We learn, according to the preface, that "The Kernel" is the sobriquet of Lieutenant-General H. P. Hawkes, C.B. There are some capital half-tone illustrations scattered throughout the book. *Photography in a Nutshell* is full of well-selected information.

Diamond Jubilee Photographs.

Marion & Co., Soho-square, W.

No better memento of the Queen's Procession on June 22 last could be desired than the album of half-tone views issued by Messrs. Marion. The photographs were taken from a highly favourable standpoint in Trafalgar-square, with the National Gallery in the background, and in the sixteen views practically the whole of the Procession has been included. The photographs have been well reproduced, and this, with the fine quality of the printing, makes the album a remarkably good one. Descriptive letterpress accompanies each picture. The views are also issued on Mariona (glossy) paper; and Messrs. Marion have further secured a series of animated photographs. They inform us that they have also made arrange-

ments for the publication of photographs, in album form, of the Naval Review at Spithead, from negatives made by Messrs. West & Son, of Southsea. These photographs give a very comprehensive idea of the miles of ships present on that occasion.

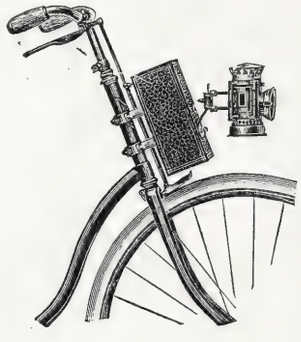
Kodak Bicycle Cases and Attachments.

The Eastman Photographic Materials Company, 115, Oxford-street, W.

The lightness and unbreakable character of film make the Eastman Kodaks particularly suitable for carrying on the cycle, and, in addition, the Company have devised special means for safely securing their cameras to the machine.

The carrying case for the No. 4 Cartridge Kodak is of very simple and efficient design. It is strongly made of wood, covered with fine-grain leather and lined with cloth, and is fitted with springs on the inside, which take up the vibration of the wheel and prevent injury to the camera. By means of two single thumb-screws, which securely grasp the tubing, the case may be attached to the head of the machine, or suspended from the top bar, inside the frame. Although carrying a camera giving so large a picture as one five inches by four inches, the case is only three and three-quarter inches





in thickness, and in no wise inconveniences the rider when hung from the top horizontal bar, nor does it run much chance of injury in case of a fall. The clamps can be attached to any side of the case (except, of course, the door), and, in using it on the bicycle head, the door may be at the top, at either side, or directly in front, in which latter position the case presents almost no "wind resistance." There being no play at the points of contact with the machine, it will not wear the enamel. The outside measurements of the case are $3\frac{3}{4} \times 5\frac{1}{4} \times 8\frac{7}{8}$ inches.

The door fastens with a strong brass catch, which is very ingenious, and can be opened with one hand, yet cannot jar open, and will not rattle.

By means of a set of adjustable washers, the case may be held far enough in front of the bicycle head to allow for the free passage of a brake rod. It may also be provided with a lamp-bracket attachment. A set of washers are furnished with each case, and by their use the clamps will firmly grasp any tubing from seven-eighths of an inch to one and a quarter inches, both inclusive. No wrench, screwdriver, or other tools are necessary in making the attachment.

The Jubilee Souvenir Border Negative.

W. Tylar, High-street, Aston, Birmingham.

Mr. Tylar sends us a specimen Jubilee border negative on celluloid, quarter-plate size. On the border are artistically arranged portraits of the principal members of the Royal family and views of Windsor, Balmoral, &c. An opening of $2\frac{1}{4} \times 1\frac{3}{4}$ inches is left so that a small view or portait photograph may be printed in. These tasteful and elegant border negatives should be in great demand among amateurs and others.

Over the Northern Heights.

By Alfred Holiday. R. E. Taylor & Sons, 19, Old-street, E.C.

This is one of the firm's well-known Rambles Round London series, and supplies the pedestrian with a clear guide to walks in the neighbourhood of Windsor, Ruislip, Colnbrook, Uxbridge, Datchet, Eton, Burnham Beeches, Slough, Taplow, Stoke Poges, &c. All these places lie due west of the metropolis, so that the title of the book is scarcely correct; but this is a trifling fault.

The same publishers send us a copy of Nature Chat, by Edward A. Martin, F.G.S. (price 1s.) This, in the author's words, "deals i a simple manner with some of the most familiar objects which ar met in one's daily contact with nature." Flowers, trees, birds birds' nests, insects, fishes, and most of the natural history phenomen of the seasons, have come under Mr. Martin's observation, and hi recorded notes are calculated to be useful and informative to mem bers of rambling clubs and others given to the study of nature.

The Primus "So-li-to" Camera.

W. Butcher & Son, Blackheath, S.E.

This is essentially a cyclists' and tourists' camera. A quarter-plat weighs two pounds, and it is of the field-glass pattern with mahogan body. It is covered in leather, the fittings are oxidised, and carries a single lens with rotating stops. A time and instantaneou shutter with adjustable speeds, Edwards's metal double dark slide



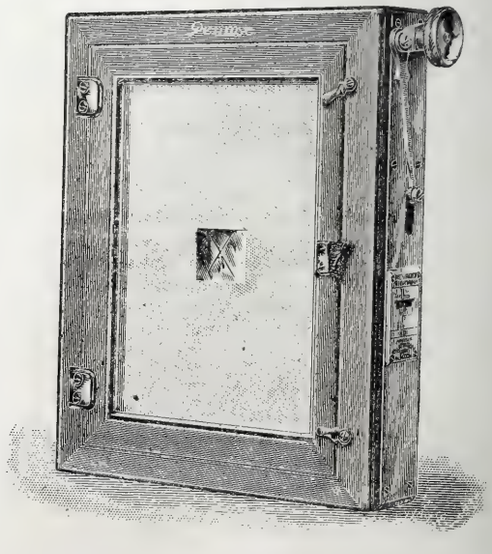


and a ground glass view-finder are among its other features. Th manner in which it is employed may be gathered from the followin instructions:—Remove the dark slides from inside the body of camer place the dark slide in position, and press the sides of the came (which fold down) up into position, set the shutter by means of th cord, remove the shutter of dark slide, and when the picture seen on the view-finder release the shutter.

The Penrose Screen and Plate-holder.

Penrose & Co., 8, Upper Baker-Street, W.C.

The particular object Messrs. Penrose have had in view in makin this slide has been to provide a means by which any one desiring t work the half-tone process on a small scale may be able to do s with any existing camera, instead of being deterred by the heav expense of a special camera. The screen and plate-holder is mad as closely as possible to the usual sizes of dark slides of ordinar



cameras, so that with an adapter it will fit most cameras. The slid is somewhat thicker than an ordinary one, to allow for the mechanism for moving the screen, and, to avoid altering the register of th ground glass, there is provided a separate ground-glass frame whic fits into the slide in the plane of the sensitive plate. When th focussing has been done and the screen adjusted, the shutters of th slide are reinserted and the plate put in. The invention is probabl

in the way Messrs. Penrose have solved the difficulty of obtaining a mechanically actuated parallel movement of the screen in such a small compass. Although the half-plate slide is only one and a half inches thickness over all, they get a movement of a quarter-inch for the screen, besides allowing space for the screen and plate-carriers and shutters. Nevertheless, all the parts are strongly built. The ruled screens can be set as to distance by the most up-to-date methods, either by means of the ivory scale divided both into one-thirty-second parts of an inch and millimetres, or by means of observation, with a microscope on the transparent patch of the focussing screen. Those who desire to try their hand at half-tone direct from nature can readily do so by means of an apparatus of this kind, which can be fixed to their landscape camera. This screen and plate-holder was shown and described at Great Yarmouth on the occasion of Mr. Gamble reading his paper on half-tone.

On English Lagoons.

By Dr. P. H. Emerson. Cheap edition, price 3s. London: David Nutt, 270, 271, Strand, W.C.

At a time when the attention of so many photographers has, by reason of the recent visit of the Convention to East Anglia, been turned towards the river and broad country of Norfolk and Suffolk, the publication of a cheap edition of Dr. Emerson's book occurs with peculiar appropriateness. It is a record of a year's yachting, fishing, and shooting, the voyage being made in a small wherry, *The Maid of the Mist*. In the very first chapter the author avows himself a lover and frequenter of mists, as well as of bright sunshine, and this prepares the reader for the singularly catholic view of nature which Emerson takes throughout all the fascinating narrative of his wanderings on these eastern waterways. It is a thoroughly Bohemian voyage that he tells us of, but his keen eye missed no single incident of nature life in the panorama that passed before him during those enviable months. Nor does the picturesque in human life and character escape his notice, and thus the book is eminently racy of the soil in all respects.

There is no waste of words in this lovingly delivered song in praise of the true life of the Eastern rivers and broads, among which Emerson has so long thought and wrote. Here are one or two characteristic examples of his style. The wherry has been snowed up: "I went for a two hours' walk in the moonlit, snowy landscape, for such a scene is dear to me beyond expression. The silent, pure, radiant beauty of the world at such an hour seems to fill your life." This is the outburst of the nature lover in reference to the loss of a friendly kingfisher: "A few days afterwards an idiot from Beccles shot him . . . to sell to another fool to be stuffed and set up in a glass case, to be bought by the third and biggest fool of all, that vain creature—the collector." Here is a reflection which carries a great home truth in it: "Much of the false pity and sentiment in life is due to second-rate art, for your mediocre craftsman always describes humanity from his standpoint, as he imagines he would feel were he in the position of the pitied; but the sufferers seldom realise misery as does the sentimental writer."

On English Lagoons directly appeals to all lovers and students of nature, for it is the work of a sympathetic hand. There are some half-tone reproductions of the author's photographs given.

Artistic Lighting.

By James Inglis. Chicago: The Photo Beacon Publishing Company.

This is a book that should prove helpful to many of our readers. The author is a photographer of thirty years' experience, and, in the course of half a dozen chapters, which are illustrated by examples, he gives much valuable information concerning the lighting of the face and the variety of effects that may be obtained. The "single-slant" or side-light studio is the one in which he has worked, and his remarks on the manner in which the light may be controlled in such a studio are very useful and practical. A couple of chapters on at-home portraiture are added to the book, which is priced to sell in America at one dollar.

De la Propriété Artistique en Photographie.

By E. Sauvel. Paris: Gauthier-Villars et Fils.

The author summarises the French law with regard to copyright in photographs, and quotes numerous cases bearing on the matter. The copyright laws of other countries are also referred to. If we compare the French law of copyright with that obtaining in these islands, there does not appear much to choose between them—in both countries the relations of sitters and photographers appear to be pretty much the same, so far as the operation of the major provisions of the copyright law is concerned. M. Sauvel is an authority on the subject, and his book is, doubtless, of great interest to French readers. We note that English copyright law is condensed into three lines!

Die Entwicklung der Auskopier-Papiere.

Ed. Liesegang, Düsseldorf.

Dr. R. Ed. Liesegang has made the development of printing-out papers a special study, and this work embodies the results of his numerous experiments with various developers. The subject is treated from the theoretical and practical standpoints, and we recommend the work as one of great interest to those in search of new effects in printing upon chloride papers.

K. K. Graphische Lehr und Versuchsanstalt in Wien.

We have received the programme of the Imperial Technical Institute in Vienna. There are now four Departments:—

1. School for Photography and Mechanical Processes.
2. School for Book Printing and Illustration.
3. Experimental Department for Photographic Chemistry and the various branches of book production.
4. The Collection and Exhibition of Specimens, Apparatus, &c.

Details of the curriculum are given, as well as the conditions upon which pupils are received.

Die Kunst in der Photographie.

Julius Becker, Berlin, S.W.

The third number of this interesting and artistic periodical has reached us, and in it the editor, Herr Franz Goerke, gives an account of the formation and success of the Paris Photo-Club. The folio comprises six photogravures of works exhibited at the last Salon of the Photo-Club. They are by French amateurs, and have been selected to represent the art of the French School of Photography. These pictures are by Paul Bergon, Maurice Bremard, Maurice Bucquet, F. Coste, Robert Demachy, C. Puyo. The *Actstudie*, by Bergon, is a very chaste study from the life, and Puyo's picture, *Eingeschlafen* is a very fine study of a sleeping girl. There are also some very good process pictures in the text, and Bucquet's *Musician* deserves special mention.

Catalogue Received.

Archer & Sons, Lord-street, Liverpool.

Messrs. Archer's Catalogue extends to 116 pages, and it contains illustrations, prices, and particulars of a great variety of apparatus suited to the requirements of the modern photographer. The Catalogue is excellently produced, and gives prominence to the firm's specialities in cameras, lanterns, &c.

News and Notes.

Professor W. Crookes will be nominated as President of the British Association for the Bristol meeting of 1898.

The Convention Group.—No. 84 is Mr. Arthur W. Green; No. 86, Mr. Archer Clarke; No. 139, Mr. P. R. Salmon. No. 135 is Mr. G. W. Tottem (not "Tollens," as printed).

Sensitiveness of the Retina to X Rays.—Mr. E. Braun writes to *Nature*: "Is it not possible that the persistence of an image on the retina is due to phosphorescence? This would at once explain the sensitiveness of the retina to X rays."

The North Down Postal Photographic Club.—Mr. T. Le Spencer, of North Down, Wrotham, Kent, writes: "There are a few vacancies in the above Club, and I shall be pleased to receive the names of any ladies or gentlemen wishing to join such a Club. The album circulates once a month, and the subscription is 1*s*. Application for membership should be accompanied by two specimen prints."

At Guildhall Police Court, on Saturday, July 24, Pat N. Conroy, a young Irishman, was charged with obtaining money by false pretences. It appeared that on May 14 last the prisoner called on Mr. Meek, at the *Photographic News* office, and, on the faith of the representation that he was known to Mr. Wall, the Editor of the paper, succeeded in obtaining the sum of 2*s*. 6*d*. Mr. Meek having given evidence, Mr. Wall was called, and stated that he had no knowledge of the prisoner, whom he had not seen before. The prisoner was remanded till this day (Friday).

MESSRS. FUERST BROTHERS, of 17, Philpot-lane, London, E C., write: "It may interest your readers to know that we are in a position to supply four scenes of the Aldershot Jubilee review (1897), including the Queen's arrival and departure. Of the Royal Henley Regatta (1897), we can supply the final race for the Grand Challenge Cup, and the final race for the Diamond Sculls. The above films can be had either with Lumière or Edison perforation."

Re ARTHUR HOLDSWORTH LEACH, Photographer (late of Brighouse, now residing in lodgings at Halifax) —The public examination of this debtor took place at the Halifax Bankruptcy Court, before the Registrar, on Monday. The statement of affairs filed by the bankrupt disclosed liabilities amounting to 247*l.* 14*s.*, and there were little or no free assets. The liabilities consisted principally of damages and costs given against the bankrupt in the action Crowther *v.* Leach, for breach of promise of marriage, tried at the Leeds Assizes in March last. A short time before the action, the business was turned into a limited company, and he had divested himself of all proprietary interest in it. The nominal capital of the Company was 500*l.*, held chiefly by his mother, sister, and friends. He admitted that his name appeared among a plan of local preachers. After a long examination as to his financial transactions, the examination was ordered to be adjourned until October.

THE alleged reflexion of kathodic and Röntgen rays have been made the subject of two independent but closely allied investigations by Professor A. Battelli (*Nuovo Cimento*, v. 4) and M. P. Villard (*Bull. Société Française de Physique*, 95). Professor Battelli's conclusions are as follows: (1) It cannot be asserted that kathodic rays are reflected according to the regular law; (2) rays coming from the speculum of a focus tube have the same properties as direct kathodic rays; (3) the same properties are possessed by rays coming from the anterior face of a very thin lamina, on whose posterior face kathodic rays impinge; (4) a pencil of such rays seems to be constituted of different kinds of rays which, when they fall on a thin body, appear to traverse it in somewhat the same manner that they would traverse a filter which allowed some rays to pass through more freely than others. M. Villard finds that kathodic rays that have fallen on a thin metallic lamina, emerge in the form of a diffused pencil, whose general direction is normal to the lamina, but the phenomenon appears to be a kind of refraction. Reflexion is more easily obtained, and the phenomenon can be photographed; the reflected rays possess all the properties of kathodic rays, and are strongly deflected by the repulsive action of the kathode. Experiments show that this reflexion, though evidently anomalous, is perfectly definite.

THE PREPARATION OF ORDINARY ETHER.—M. Prunier says: "In the study of the preparation of ordinary ether by means of sulphuric acid and alcohol, most workers have omitted to take notice of the presence of sulphonic acids and their derivatives. This group of bodies is, however, to be found in notable quantities in commercial ethers, it is also found in considerable proportions in the oils which have been used in the rectification of the raw product. By direct experiment it is possible to prove the formation of several sulphonic derivatives, especially towards the end of the operation. To separate the derivatives actually formed by the action of sulphuric acid, it suffices to heat sulphovinic acid with dilute sulphuric acid to 140°, then add a little alcohol. By this means a small quantity of ordinary ether is formed, and several sulphonic derivatives of varying volatilities, some of which even distil over with the ether. They are formed in greatest abundance when the temperature exceeds 140°, and, above all, if undiluted sulphuric acid be used. It is exactly the same as in the preparation of ethylene; if the operation be interrupted when the liquid becomes dark (165° to 175°), we can at that moment detect the presence of a large quantity of sulphonic compounds which exist in the liquid, along with the sulphuric acid in excess, traces of sulphovinic acid, neutral sulphuric ether, polyethylenic compounds, and also sulphurous acid.

EXPERIMENTS ON COMMERCIAL ALBUMEN.—M. P. Carles says: "The adoption of albumen as a clarifier by several industries has brought a number of different brands on the market; some can be used with every confidence, but, unfortunately, with a view to cheapen its production, there are also brands carelessly made, and, what is worse, adulterated. Some samples have been found to contain from twelve to twenty-five per cent. of insoluble coagulated matter, having no clarifying power whatever. Gum, dextrine, and gelatine are also used as adultrants. To examine the purity of albumen, 2 grammes should be made into a paste with distilled water, then more water gradually added, up to 200 c. c.; if the albumen be free from coagulated particles, the solution will be translucent. To 100 c. c. of this solution add 35 c. c. of a one per cent. solution of tannin, then 0·2 gramme of powdered bitartrate of potash. Shake well and filter. To 1 part of the filtrate add a few drops of a solution of 5 parts per 1000 of grenatine, and to the other a few drops of the tannin solution above mentioned. If there is no change, the albumen is pure; if the grenatine gives a precipitate, it shows that there is tannin in excess, and therefore that the albumen is either adulterated with some inert body, or has been over-heated in making. If, however, the tannin gives a precipitate in the last tube, it proves the presence of gelatine in the sample, as gelatine will precipitate, weight for weight, four times as much tannin as dried albumen can.

DEATH FROM PYROGALLIC ACID POISONING.—Dr. Bradshaw Reilly writes in the *British Medical Journal*: "On May 1, at ten a.m., I was summoned to Mrs. H——, married, aged thirty-two, by her father, who stated that he thought his daughter was dying; he also stated that she had had trouble with her husband, was living apart from him, and had seen him the previous evening. She was in good health the night before, and had enjoyed good health previously. Her condition on my arrival was as follows: Her face was of a dirty grey colour, with the exception of her lips, cheeks, and ears, which were dark blue. She was conscious, her pupils normal, and her skin cold. The heart was acting feebly, and she took no notice of anybody, but would answer questions put to her. The tongue was dark brown and dry, and she had vomited for two hours before my arrival, but that had now ceased, and the vomit had been thrown away. She complained of no pain, and exhibited no tenderness on pressure over the abdomen. I found no disease of the heart or lungs, and her mother informed me that she had menstruated a fortnight before. I then asked her relatives to leave the room, and questioned her as to whether or not she had taken poison; this she firmly denied. The room was then searched and nothing suspicious found except a pudding basin under the bed, which appeared clean. Large doses of ether, ammonium carbonate, and digitalis were given, mustard applied over the heart, and hot-water bottles to the feet, the result being that after some time the heart acted slightly better, but there was very little improvement. Shortly after diarrhœa set in and continued throughout the day, and the urine which was passed consisted principally of blood. On May 2 the diarrhœa ceased, but her appearance was unaltered; she then complained of severe headache, but had no other pain, and seemed in a drowsy condition, answering questions when spoken to. Later in the day her mother told her she thought she was dying, and then she confessed that she had taken poison, and that the bottle was hidden under the carpet, where it was at once found. It was an ordinary one-ounce bottle of pyrogallic acid, used by the father for photography, practically empty, and was said to have been half full the day before. She had mixed the contents with water in the basin found under the bed, and swallowed the fluid. On May 3 she was decidedly worse, her face was deathlike, yet she could understand when spoken to sharply. Later in the day she became comatose, and died at four a.m. on May 4, or about sixty-eight hours after the first symptoms were noticed. I tested what little remained in the bottle, and found it to be pyrogallic acid. At the post-mortem examination all the viscera were intensely congested; the kidneys were of a dark purple colour, the bladder contained blood, the heart cavities were full of clot, and the stomach and intestines showed patchy congestion. *Remarks.*—The absence of gastric pain or tenderness after a large dose (half an ounce), the intense cardiac depression, apparently not relieved by the ordinary cardiac stimulants, the cyanosed condition with hæmaturia, and the slowness of death, appear to me worthy of notice. I am unable to find any record of death in the human being from this poison."

Patent News.

THE following applications for Patents were made between July 14 and July 21, 1897:—

LENSES.—No. 16,520. "An Improved Method of Grinding Astigmatic Surfaces." G. PRESCOTT.

COLOURED PHOTOGRAPHS.—No. 16,584. "Improvements in the Production of Coloured Prints or Photographs." J. W. COLLINGS.

PHOTOGRAPH FRAMES.—No. 16,923. "Improvements in, and Additions to, Frames for Displaying Photographs, Menu Cards, and the like." A. A. WOODWARD.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
2.....	**Hackney**	Excursion: Longcross. Leader, J. Wilmer-Cole.
2.....	**North Middlesex**	Excursion: Rochford. Leader, J. C. S. Mummery.
3.....	Aintree	Flowers and Faces.
3.....	Birmingham Photo. Society ...	Excursion: Banbury. Leaders, S. H. Beale and C. J. Fowler.
3.....	Hackney	Open Night.
4.....	**Photographic Club**	Open Night
5.....	Bradford Camera Club	*One Hundred Finished Prints, and How Obtained.* W. Harmsworth.
5.....	**Oldham**	Excursion: Bolsover Castle. Leader, J. S. Dronsfield, J.P.
7.....	Darwen	Excursion: Clitheroe (for Waddington). Leader, Geo. Butterworth.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 22,—Mr. A. Haddon in the chair.

THE COLOUR OF THE NEGATIVE.

Mr. RICHARD PENLAKE spoke of some trouble he had met with in developing Lumière's plates, being much bothered with yellow negatives, despite the fact that he had used everything which suggested itself to him as likely to yield a negative in black and white. He was well enough pleased with the colour of the negative himself, but the party for which he was working required black-and-white negatives. He was in a peculiar position, the plates, chemicals, &c., to be used being provided for him, and to these he was tied down. He then gave the proportions of the sulphite and other ingredients composing the developer, which was that recommended for the plates by the makers, and was a pyro-soda developer.

It was unanimously considered that the proportion of sulphite of soda was inadequate to secure a black-and-white negative.

Mr. PENLAKE, however, stated that he had suspected that, and had accordingly increased the quantity of sulphite, but with indifferent success.

Mr. MACKIE had not found the slightest difficulty in getting black negatives with a pyro developer, and advised an increase in amount of the sulphite.

Mr. WELFORD was of opinion that no amount of sulphite with a pyro-soda developer would bring out a black negative.

The CHAIRMAN remarked that it was quite likely that the particular specimen of sulphite used was contaminated with a large amount of carbonate, which would explain matters considerably.

Mr. A. L. HENDERSON recommended the use of the developer given below:—

A.

Hydroquinone	100 grains.
Metol	40 ,,
Sulphite of soda	960 ,,
Water	20 ounces.

B.

Soda hydrate	100 grains.
Carbonate of potass	120 ,,
Water	20 ounces.
Potassium bromide	*quant. suff.*

For use, equal parts of A and B are taken. This formula works very well with Lumière's plates.

Amongst the objects of interest on the table, was a little finder shade, which, when not in use, folded down into very small compass. Also a camera, lately put on the market for the especial use of cyclists, which folded up into a narrow case so as to be carried within the frame of the machine, and, unlike most cyclists' cameras, did not interfere with the leg motion. It was notable for its extreme portability and the shape such portability took, the leather case containing a 5×4 camera of the usual folding pattern, with rising front, Bausch & Lomb shutter, and three double slides. It was made by the Rochester Optical Company of America.

Mr. HENDERSON passed round some lantern slides of the late Convention meeting, and made a few remarks on the proceedings, which he was pleased to say passed off very successfully. As regards the Chassagne colour process, he had little of a favourable nature to say, and energetically protested against the representation of its capabilities which had been offered to the public.

Some discussion ensued on this subject.

Some prints from the film exposed at Yarmouth by Mr. Prestwich's apparatus for animated photography were passed round, Mr. HENDERSON remarking very favourably on the cleverness displayed in its construction.

An album of Convention views was also shown by Mr. Welford.

Mr. P. EVERITT showed one of the component parts of the Zeiss Convertible Anastigmat, working by itself at 12·5 without a stop. The foci of the two components were 9½ and 11 inches. When coupled together, the doublet so formed makes a lens of 5¾ inches focus, working at *f*·7. The single components made remarkably fine single lenses, and the speaker thought it one of the greatest achievements of the new glass, that we should have a single lens working at 12·5 giving fine definition without any stop, and covering a pretty good angle. In the whole lens we have three distinct lenses, and the stop being so near to the lens minimises the distortion of the single lens.

Hackney Photographic Society.—July 17, Mr. Rawlings in the chair.—Mr. HENSLER gave his paper,

A FEW REMARKS ON TONING,

in which he dealt with platinum toning with matt surfaced paper. Some very fine results, with a wide range of tone, were shown.

North Middlesex Photographic Society.—July 19, Mr. H. Smith in the chair.—The President announced that an outing would take place on Bank Holiday, August 2, to Rochford. He had arranged for dinner at the White Hart, and hoped there would be a good muster. Mr. MACINTOSH then gave a demonstration on

ALPHA PAPER.

The lecturer said the process was not apparently so widely used now as formerly, but it was a process capable of exceedingly beautiful results, and of great range of colour, but required care in using. The paper kept well, and that which he was using that evening was two years old, and the results bore out his remarks. The finished prints, when properly prepared, kept as well as any silver print, and he passed round the Club Album, which contained four or five prints made by himself at various times, some quite five years old, which were as perfect as when made. He went into the chemistry of the paper, saying it contained bromide, chloride, and citrate of silver; the former enabled it to be printed by gaslight, the two latter allowed of warm tones being obtained. A weak ferrous-oxalate developer is used, and, after clearing in weak sulphuric acid (about 1–200) and washing, the prints are toned in a combined bath. He exposed four prints, from one minute to four minutes at six inches from a bat's-wing burner, and successfully developed them. When you know what exposure to give for a certain negative, you can get similar results in the finished prints. A correctly exposed print showed a violet-brown tint in the shadows when developed; if of a red colour, it was caused by over-exposure. Under-exposure gave a greenish-black colour, very difficult to tone. If the toning was continued long enough, it passed from red, through brown, to blue. If the paper is properly treated, it never gave double tones. In the competitions for prints of the Harpenden and Theydon Bois outings Mr. H. Smith was first and Mr. A. H. Lisett second.

FORTHCOMING EXHIBITIONS.

1897.		
Sept. 1–Oct. 13	Glasgow International.	W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
December 9–11	Aintree Photographic Society.	

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE POINTS OF A LENS.

To the EDITORS.

GENTLEMEN,—In your report of the Convention meeting of Thursday, 15th inst., I find I am credited with the following remark: "An angle of 60° did not give distortion at the sides of a plate." Among other slides kindly lent me by Mr. Debenham, I purposely showed one of some balls, the angle included in taking the subject being the "conventional angle of 60°," which was supposed not to show distortion at the sides of the plate. I pointed out how necessary it was, even with this angle, to keep the eye central in order to be able to view the balls at the side of the picture as round, and how terribly distorted they were when looked at centrally! Further, had the balls been replaced by beautiful heads, that those depicted at the side would have just cause to complain of the "likeness."

The views of Richmond Bridge, that Mr. Hepworth was kind enough to take for me, illustrated the four different uses to which the Stigmatic lens can be applied, showing the varying sizes of images obtainable and the different angles included.—I am, yours, &c.,

THOMAS R. DALLMEYER.

25, *Newman-street, London, W., July* 26, 1897.

THE NEW ERA IN LENS CONSTRUCTION.

To the EDITORS.

GENTLEMEN,—Is Mr. Jourdain so forgetful that he fails to see why I did not give the amount of astigmatism in the Cooke lens? It was given, by reference to the *Amateur Photographer*, in his own letter of July 9, and I then pointed out that astigmatism in the *f*·6·8 lens (Steinheil's Orthostigmat, type ii.) only began at about that point of the corrected field, where it was greatest in the Cooke, by Mr. Jourdain's own showing.

What are the leading facts of this correspondence?

Messrs. Taylor, Taylor, & Hobson's photograph with a Cooke lens, Series III., at *f*·8, includes an angle of 54°.

The photograph I sent the Editor, taken with a Goerz lens at *f*·7·7, includes an angle of 67°.

Steinheil's Orthostigmat, type ii., *f*·6·8, has a corrected field of about 65°, and I have quoted the measurements up to 70°. As proof a reproduction of an astigmatic test is given in their catalogue.

More than eighteen months ago, I stated that the five-inch Cooke lens I then tried was not rectilinear near the margins of a 7½×5 plate. I repeated this in my last letter, and it has not been contradicted.

Yet, notwithstanding these facts, Mr. Jourdain would have us believe the "unsurpassable excellence" of the Cooke lens, in substantiation of which claim Messrs. Taylor, Taylor, & Hobson have only submitted comparisons with an old type of lens, the rapid rectilinear. I ask for comparative tests with the best of modern anastigmats.

I have not had an opportunity of trying the Stigmatic lens, but I have seen some photographs taken with it, and I have good reason to believe that comparative tests of the Cooke and Stigmatic lenses have been made by an independent person. As a pendant to the correspondence of nearly two years ago, Messrs. Dallmeyer might publish such tests as evidence of what they can now produce.

Mr. Jourdain would do well to test the Convertible Anastigmat *f*·6·3 and consider the results in comparison with the Cooke. I use one of this series on a hand camera. The focus is 5¾ inches and the aperture *f*·7. It gives me two other foci, 9½ and 11 inches for larger figures or distant views. These single lenses work without a stop at *f*·12·5. I also use the same lens on a 7½×5 camera. The 5¾-inch combination is an excellent wide-angle lens for this size, and the two single lenses are the finest of the kind I have seen. For the longer side of a 7½×5 plate the 11-inch lens is nearly rectilinear. When the Cooke can rival the universality of this lens with the same degree of perfection, it will be nearer the goal of its ambition.—I am, yours, &c., PHILIP EVERITT

88, *Evering-road, N., July* 24 1897.

[This correspondence here terminates.—EDS.]

BACKING PLATES.

To the EDITORS.

GENTLEMEN,—We notice on p. 479 of this week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY a letter from Mr. A. L. Henderson in which the words occur, "I would very much prefer a backing that is soluble and innoxious in the developer; but this necessitates coating after the emulsion, and this would not tend towards the keeping of the plates," &c.

We would suggest to M. Henderson that our "Anti-halo" series just "fill the bill." The backing is soluble, and will not hurt development or stain the negative. It is not coated after the emulsion, and there cannot be the slightest question as to the keeping qualities of those plates. While on this subject and in extension of your remarks on p. 450,

July 16 issue, we would like to mention that we have supplied ready-backed plates for nearly four years.—We are, yours, &c.

The Grove, Hackney, London, July 22, 1897. B. J. EDWARDS & Co.

GEOLOGICAL PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—In connexion with the S. E. Union of Scientific Societies, a section for geological photographs has for some time been established with the following objects:—

(1) To stimulate interest in the observation and recording of geological phenomena.

(2) To form *annually* a set of lantern slides dealing with some part of the geology of S. E. England, and to circulate these, with an explanatory lecture, amongst the affiliated societies during the winter session.

(3) To form a *permanent* collection of geological slides and photographs, which shall illustrate, as completely as possible, the structure of our district, and be available for use at any time by the affiliated societies.

(4) To help forward the national collection of geological photographs which is being formed at the Jermyn-street museum under the auspices of the British Association.

We are at present at work on the Upper Greensand, Gault, and Lower Greensand, and should be grateful for the gift or loan of slides, or for the gift of photographs illustrating these formations. If any of your readers should feel inclined to help us in the above scheme, I shall be very glad to furnish them with further particulars.—I am, yours, &c.,

H. E. TURNER,

Hon. Sec. of Photographic Section, S. E. Union of Scientific Societies, Bank-street, Ashford, Kent, July 26, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

F. Poxton, 26, Albion-street, Scarborough.—*Photograph of the Colonial troops' procession at Scarborough.*

Thomas Wallace, Eskbank-road, Dalkeith.—*Photograph of group of members of the Franco-Scottish Society.*

Thos. F. Forde, 15, Waterloo-place, Sunderland.—*Photograph of the Mayor (Alderman William Barns) and Corporation of Sunderland, June,* 1897.

French & Co., 1, Railway-terrace, Wallington.—*Photograph of their Royal Highnesses the Duke and Duchess of York and orphan girls at the Royal Victoria Patriotic Asylum.*

PHOTOPHIL; COPYRIGHT; J. M.; W. H. WHEELER; INQUIRER; CAVEAT EMPTOR.—Received; in our next.

M.—No. 1.

R. H. PRESTON.—Thanks. We will retain the correspondence for a short while, as we shall probably make reference to the matter.

CARBON TISSUE.—HUNTS. If the tissue has become mouldy through being kept in a damp place, it is a waste of time to sensitise it with the idea of getting good prints upon it.

"SUET-PUDDING" RETOUCHING.—S. R. BREWERTON asks: "What is 'Suet-pudding' Retouching?"—In reply: We take it that Mr. Pringle, the author of the phrase, alludes to over-retouched portraits.

FLASHLIGHT.—AUTUMN. Personally we have had no experience with the apparatus referred to, though we have seen some very good work that has been done with it. Why not call at the agent's and see it used?

ROUND FIELD IN LENS.—R. BLAYTON. The three photographs sent, focussed on different points of the subject, prove conclusively that the lens has a very round field, much rounder than is usual in modern lenses of that type. The only thing we can suggest is to return it to the dealer for exchange.

ANIMATED PHOTOGRAPHS.—ST. CLAIR says: "Will you kindly let me know where I can procure animated books wholesale, which I understand are now on the market, I mean the small books that give a lifelike action by turning the leaves?"—In reply: Of Mr. S. Lubszynski, 4–6, Königsstrasse, Berlin.

MOUNTANT.—S. ROBERTSON. The cement mentioned is a very adhesive one, but what effect it may have on silver prints we are unable to say, as we do not know its composition. It is a very good adhesive, and that is the only thing we can say for it. We have never heard that it is specially recommended for mounting photographs, however.

HYPO.—In the case you cite, much would depend upon the distance of the dark rocks; but, assuming them to be, say, from thirty to a hundred yards from the camera, we should be disposed to give, other things being equal, somewhat less of an exposure than to the landscape, as we take it that there would be a greater preponderance of diffused and reflected light than in the other case.

IMPERFECT NEGATIVE.—T. WADE. The "curious appearance" on the negative is due to hyposulphite of soda crystallising out of the film. Had the negative received ordinary care in the washing, it would have had no such curious appearance.

MUDDY TONES.—A. PETTIT asks: "Can you tell me the reason why, when I try to get rich, deep tones, I always get the dirty, muddy tones like the enclosed? When I try for reddish-brown tones, I get what is satisfactory. The paper I get from ——."—The reason is that the paper will not bear being toned beyond the red-brown stage without becoming mealy, and like the samples sent. Some other brand will perhaps suit our correspondent better.

REGISTRATION.—NOTTS writes thus: "I have invented a new hand camera, but I do not care to go to the expense of a patent for it. I am told that, if I register it, registration will be as good as a patent. Will you please say if this is so, provided the apparatus is marked registered?"—Yes, if you do not wish to keep the invention to yourself; if you do, then the only way will be by a patent. Registration in such a case is of no use whatever. It would be a waste of money.

COPYRIGHT.—PURCHASER. In purchasing the business and the copyright negatives, it will be necessary to have the copyright in each of these negatives duly assigned to you, and the assignment registered, or it will not pass to you. Unless that is done, you will have no property in the copyright, although you have in the negatives themselves; that will remain the property of the author or his assignee, although he may not, and probably would not, make use of it. Others would not be debarred from pirating the picture so far as you are concerned.

STUDIO.—F. BLACKBURN says: "I should feel obliged if you would answer the following questions:—1. How many feet of glass are required in a studio twenty-six feet long, if I only require to work at one end? 2. At what distance from the end should the glass begin? 3. Would a No. 3 Ross take a full-length in that length studio?"—In reply: 1. About thirteen feet. 2. Three feet six or four feet. 3. If a No. 3 cabinet lens, the studio will not be long enough for a full-length cabinet portrait. But it would be long enough to take a full-length *carte* picture with that lens.

BROKEN NEGATIVE.—S. C. S. Of course it is very vexing to have a negative that is prized broken at the printers', particularly before the first print was completed; but your idea of suing for five pounds for a quarter-plate negative is absurd, particularly as it is only of an ordinary landscape subject. It is a recognised thing amongst trade printers and enlargers that, although they take every care, they will not be responsible for negatives while in their possession. Probably your negative was on uneven glass, and that is why it broke in making the first print.

LENS.—S. MATTHEWS says: "In a discussion between three or four amateur friends, one said that if two periscopic spectacle lenses were mounted, with their convex surfaces outward, at the end of a tube, and used for taking photographs, the combination would give straight lines. Is this not wrong? and to get straight lines must not the lenses be achromatic?"—Such an instrument would give straight lines, provided the stop were placed midway between the two glasses. The combination would, of course, have a chemical focus, but that has nothing to do with its rectilinearity.

STRIPPING NEGATIVES.—FILM asks: "Could you kindly inform me of a reliable method of stripping gelatine films? As I travel about a good deal, I find the weight of glass considerable and very awkward of storage. I never destroy good negatives, as I frequently require a reprint. Most of them have been in alum bath."—If the plate be immersed for a few minutes in water slightly acidified with hydrofluoric acid, the film will become detached, and then they can easily be removed. If the films are well alumed before they are treated with the acid, they will retain their original dimensions; if not, they will enlarge somewhat.

STUDIO BUILDING.—PYRO says: "I am intending to build a studio and shall be greatly obliged if you will kindly inform me whether the pattern I enclose is such as you would recommend. Would it not be as well to have the door at the end instead of where it is? if so, one could get the full benefit of the twenty-four feet length, whereas, by having the door by the side, some three feet or so of space would be occupied by the stand at times when perhaps those three feet might be useful. As to glass, I propose it to begin three feet from one end, to extend twelve feet, and the remaining nine feet to be boarded; can you kindly suggest what you think an improvement on this arrangement?"—The design is good and cannot well be improved upon, and we should certainly advise that the door be at the end as proposed, and of a good width. Then the camera, when necessary, can be taken outside, and thus, practically, several feet may be added to the length of the studio, a great convenience when taking groups, &c.

SECONDARY IMAGE.—F. B. WILLIAMS writes: "I have on several occasions, when photographing church interiors, had the negative rendered useless, on account of an inverted second image of the east window. I should be much obliged to you for your opinion as to whether this is likely to be an individual fault of my particular lens (Dallmeyer's rapid rectilinear), or whether, under identical conditions, the same would occur with other lenses of similar construction? The camera in every instance was tilted up as much as possible, and the front raised to its full extent, the plate being, of course, perpendicular; stop used, *f*-32."—The same would happen with any lens, whatever its construction, if the same camera be used. It is the camera that is at fault. There is a minute "pinhole" somewhere that acts as a lens, thus producing a secondary image of the bright object. If the plate were exposed on the subject for the requisite time without the lens being uncapped at all, this image would appear on development.

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EX CATHEDRÂ.

In the late summer and early autumn months many photographers visit the metropolis for the purpose of acquainting themselves with the newest productions and phases of photography. It may not be amiss if we remind intending visitors that the Crystal Palace Victorian Era Exhibition, of which the Photographic Section is signally complete in its illustrations of the various processes from Daguerreotypy downwards, remains open until the end of September. It is well worth visiting and studying by all interested in the manipulative and mechanical developments of photography. One of the curiosities shown is a camera turntable, complete and practical, made in the year, 1855! It is lent by Mr. George Mason of Glasgow. In our next we shall refer at greater length to some of the most salient characteristics of the Exhibition.

* * *

A reminder of the approach of the autumn Exhibition season reaches us in the shape of the prospectus of the Royal Cornwall Polytechnic Society's Exhibition, which will open at Falmouth on August 31 next. As usual in the section devoted to photography, medals are offered for professional and amateur work and for apparatus. This section will, as hitherto, be organized by Mr. W. Brooks, Laurel Villa, Wray Park, Reigate, of whom all information may be obtained. We may add that the Falmouth Exhibition this year reaches its sixty-fifth anniversary, and promises in variety of scientific and artistic interest to be unusually successful.

* * *

The regulations of the Exhibition, affecting photographic competitors, are as follows :—

All work sent for competition must have been executed within eighteen months of the date of this Exhibition.

Carte-de-visite portraits are excluded from the Exhibition, except when illustrating some special process or novelty. All enlargements for competition must be the work of the exhibitor.

Medals are offered for meritorious productions in the following subjects :—

Professional Outdoor Photography.—1. Landscape not less than 20 by 16 inches. 2. Landscape, 12 by 10 inches, and under. 3. *Genre*. 4. Architectural (exterior). 5. Instantaneous, including Marine. 6. Animals. 7. Enlargements.

Professional Indoor Photography.—1. Portraits, not less than 20 by 16 inches. 2. Portraits, 15 by 12 inches, and under. 3. Home portraiture. 4. Still Life, Flowers, &c. 5. Interiors, Architectural or otherwise. 6. Enlargements.

Amateur Section.—1. Landscapes. 2. Architectural, exterior or interior. 3. Alpine scenery, including Caucasian. 4. Hand-camera work not less than twelve examples. 5. Instantaneous including Marine. 6. Still Life. 7. Enlargements.

With a view to offer facilities to photographic apparatus manufacturers to bring their specialities prominently before the public in the West of England, the Society will apportion space for photographic apparatus generally, including the lantern and its appliances.

* * *

On the subject of the keeping qualities of dry plates of extreme rapidity, Messrs. Cadett & Neall, in *Dry Plates*, make the following announcement: 'In the case of plates of the very highest speed it is improbable that their qualities will remain unimpaired for more than three months. We are hard at work at the problem of making rapid plates which have keeping qualities equal to those of ordinary rapidity. As soon as we succeed—and we hope success will not be delayed—we wil give the photographer the benefit of our advance. Meanwhile we think candour is best for all parties.

The last number of the Royal Photographic Society's journal should be found of especial interest by portrait photographers. It contains eight very well-executed half-tone reproductions of portraits by Mr. Harold Baker, of Birmingham. Five of these illustrate in a general manner Mr. Baker's long-proved skill in producing effectively posed and lighted studies, and the success he invariably achieves in obtaining an individualised expression in the faces of his sitters. Three of the pictures have an educational value. They were prepared to show the great difference that can be made in the lighting of the face by varying the strength of the background. In all three cases the plates received the same exposure, and were developed in the same dish. Few who have not tried the experiment, says Mr. Baker, can quite believe that the background only is responsible for the great difference in the faces. In the first example with a dark background the face appears over-exposed and flat, yet it received exactly the same exposure as the others; in the second example, the background of middle tone gives the face in about its right depth, but the third, with the white background, makes the face appear much too heavy, and suggests under-exposure. These phototypes will pay for careful study and scrutiny, and too much praise cannot be given to Mr. Baker for his communicativeness, a characteristic with which it is seldom our lot to credit professional photographers.

* * *

The following is the text of the new official Order relating to the storage of calcic carbide: Since the Order in Council of February 26, 1897, in virtue of which certain parts of the Petroleum Acts, 1871 to 1881, were applied to carbide of calcium, the question of the expediency of exempting small quantities of this substance from the operation of the Order has occupied the attention of the Home Office, and, the Secretary of State having been advised that such exemption might be safely extended to quantities of carbide of calcium not exceeding 5 lbs., when kept in separate substantial hermetically closed metal vessels containing not more than 1 lb. each, an Order in Council was made on July 7, 1897, authorising the keeping of not more than 5 lbs. of carbide of calcium, in vessels as above described, without a licence; and the original Order of February 26 has been amended accordingly. The amending Order appeared in the *London Gazette* of July 9, 1897. It is to be observed that, where the carbide of calcium is not kept in vessels as above described, no quantity may be kept without a licence.

THE SPEED OF PLATES: MESSRS. HURTER & DRIFFIELD'S THEORY PRACTICALLY TESTED.

I.

The work of Messrs. Hurter & Driffield in the determination of plate speeds has now been before the world for several years, and it still remains what it was at once recognised to be by the few who grasped the salient features of the original paper upon its publication,* viz., the only scientific attempt to express the absolute and relative sensitiveness of a dry plate by numerical agency. The fundamental law of the Hurter & Driffield system, that the speed of a plate can be estimated by the quantitative measurement of the amount of silver deposited by development, is extremely simple to realise, and forms, as it were, the key to the whole system. So far it has not been disproved, and has perhaps not been seriously assailed—a fact of considerable importance to bear in mind having regard to the objections that have from time to time been directed at less important branches of the theory.

It will be remembered by many of our readers that Messrs. Hurter & Driffield's first paper appeared to disturb the beliefs of most photographers that development gave them control over the ratios of gradation of the negative, and that the light action on the sensitive salt could be largely modified or augmented by the developing solution. We do not think we exceed the limits of the case in stating that the position taken up by Messrs. Hurter & Driffield has not been seriously shaken, notwithstanding what might have been apparently adduced in the way of practical disproof of their theory; and we are doubtful if many persons could now be found to maintain that development was anything more than complementary to the light action on sensitive plates, instead of, as was formerly generally held, a supplementary operation of a discriminative character which placed in one's hands the power to virtually ignore light as the determining factor in the production of the negative, qualitatively considered. We understand, however, that Messrs. Hurter & Driffield are at present engaged upon an investigation of development within much wider limits than were covered in their original research, and we believe their results will shortly be ready for publication.

It is of interest also to recall the circumstance that Messrs. Hurter & Driffield's rigid adherence to correct physical and chemical phraseology produced much confusion in the minds of many photographers, whose vocabulary, we must regretfully admit, is by no means free from loose and unscientific terms and expressions. Thus, with most photographers, density and opacity are taken to mean the same thing, viz., the purely physical condition of the negative image, whereas Messrs. Hurter & Driffield assign altogether different meanings to the terms, opacity, as they have more than once pointed out, being the optical property of silver to impede the passage of light through it, while density implies the relative quantity of silver deposited per unit area.

It may be well if we here endeavour to state in simple terms the chief points of Messrs. Hurter & Driffield's theory, adopting, as far as practicable, their own language. We have the greater disposition to adhere to simplicity of expression from the fact that these articles will concern themselves less with the theories involved than with their practical applications, and therefore, some familiarity with the principles of the system being assumed, our readers can the more readily follow the experiments we shall subsequently describe.

(1) "The theoretically perfect negative is one in which the opacities" (that is, the light-stopping properties) "of its gradations are proportional to the light reflected by those parts of the original subject which they represent," and therefore, with correct exposure, "there is a certain relationship between the opacities of a negative and the light intensities which produced them."

(2) There also being a comparatively simple relationship between the density (or weight of silver) of a negative and the exposure, the quantitative measurement of the silver is likewise a measurement of the light action.

(3) The relationship between the density and opacity is expressed by saying that the former is the logarithm of the

* *Journal of the Society of Chemical Industry*, May, 31st, 1890.

latter. The common logarithm of 2 (the opacity of a deposit of silver which transmits one half the original light) is 0·3. By a simple multiplication the density of a deposit is converted into the weight of silver per unit area, and consequently a measurement of the density provides a means of estimating the quantity of silver present.

(4) Transparency is the inverse of opacity, and is measured by that fraction of the original light which a substance transmits.

We might reduce these principles to their simplest form of expression by saying that a negative is of itself a measurement of the light intensity that produced it, and that therefore this light intensity or time of exposure can be given a definite numerical value. It follows also from this that, the density, opacity, and transparency of the negative having been ascertained, the calculation of the time of exposure for developed positives as well as negatives is a matter of comparatively simple arithmetic.

Such, indeed, is the practical outcome of the Hurter & Driffield system of plate-speed measurement, as we shall subsequently endeavour to illustrate. The experiments to be described were made under our eyes by Mr. Driffield himself, in whose laboratory we recently had the advantage of passing a considerable time.

We might here remark that we shall for convenience sake assume on the part of the reader, not only an acquaintance with the theory upon which Messrs. Hurter & Driffield's system of speed measurement is based, but also the method adopted in making the graduated exposures on the test-plate strips, and the photometrical reading of the resultant densities. The reader who desires to refresh his memory with the details of this part of the subject is referred to the original paper, the source of which has been previously given, as well as to a paper on the subject that was presented by the authors to the Plymouth meeting of the Photographic Convention of the United Kingdom.* A brief paper by Mr. J. Sterry is also accessible by those who desire a simple exposition of the system.†

We have already attempted to explain that the ultimate simplicity of the Hurter & Driffield system of calculating the speed of plates is such that the question of correct exposure resolves itself into merely a matter of elementary arithmetic. This is an obvious deduction from a careful study of the system. How much more clearly, then, is its simplicity apparent when, without any data whatsoever to work upon, the system, applied in practice, emerges successfully from trial and fully confirms and bears out theory? In other words, if, upon placing in the hands of Mr. Driffield a number of unexposed plates of the name and alleged rapidities of which he was purposely kept in ignorance, the photometrical readings of their densities supplied the estimation upon which their speed was based and that speed was afterwards successfully translated into correct camera exposures, may we not consider that this beautiful system of measuring and expressing plate speeds has successfully withstood a most rigid test and established its practical photographic utility?

A Query.—We have on one or two occasions referred to the strange queries relating to photography that sometimes appear in one of the evening papers that has a Notes and Queries column, which is open to any one who chooses to write. Here is a query that appeared one day last week: "PHOTOGRAPHY.—Is it possible to make up hydroquinone for developing plates, and would it pay to do so? If it would, would some one kindly inform me how to proceed?" The first part of the query strikes one as being highly amusing—and possibly, if it is replied to, the answers may be equally so—they usually are in the case of photographic queries.

* THE BRITISH JOURNAL OF PHOTOGRAPHY, vol. 40, p. 456.
† THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1895, p. 787.

Old London.—The old buildings of London are fast disappearing to make room for more modern ones. One more is doomed. The Old Bell Inn, Holborn, is to be pulled down to make room for a new hotel. This hostelry is one of the few, if not the only one remaining, in London, that has an inn yard with the old-fashioned galleries round it, so frequently described by Dickens. Next door to it is another old inn with similar galleries round its yard, though they are now no part of the hostelry itself; that, too, is to come down with the other. Those who desire to secure a photograph of an old inn yard of former generations should lose no time in visiting the "Old Bell." While alluding to old buildings, it may be mentioned that Kew Bridge is condemned, and will soon be taken down. Hence, those who desire photographs of it before its destruction should secure them without delay.

Value of Silver.—Photographers are not now so directly interested in the price of silver as they were in the wet-plate days, when silver baths had to be prepared, both for the plates and also for the sensitising of the paper. The only direct interest they now have centers more in the direction of the returns they get for the residues. For years past silver has been declining in value, and one day last week it was quoted on the market at $26\frac{3}{8}d.$ per ounce. This is the lowest point it has yet reached, and beats all previous records. Photographers are frequently recommended to make their own chloride of gold, and, in doing so, to use the current coin of the realm, as that represents the full value of the metal it contains. Not so with the silver coinage, for, at the price just quoted, the value of the metal in a crown piece is but a fraction over two shillings, as that coin weighs some forty grains less than an ounce. No one, we imagine, now makes his own nitrate of silver, or, if he does, he is not likely to use silver coins for the purpose.

COMPLAINTS are very often made as to the small returns made for residues by the refiners, and they must necessarily be small in comparison with what used to be the case years ago. Thirty years ago silver was considerably over double its present price, and was quoted as high as $60\frac{7}{8}d.$ per ounce. But that is not all; as we have explained before, in the old days strong baths were used for sensitising the paper, hence its ash contained a considerable quantity of silver. The case is different now, as, with the modern papers, they contain but little free silver. Furthermore, most of the gelatine and collodion papers are surfaced with sulphate of baryta, which is very heavy, and so increases the weight of the ashes, and that often leads to the supposition that, because so much weight of ash was sent to the refiner, a proportionate sum should be returned. When it is considered the small amount of silver the present residues contain in proportion to their weight and the exceedingly low value of the metal when recovered, the small returns made by refiners is easily accounted for.

A Novel Patent.—Comments have frequently been made as to the way patents are granted in this country. Here, so far as the Patent Office is concerned, a patent for anything, or even several patents for the same thing, may be obtained if the usual fees be paid. The Office simply takes the money and asks no questions. Two or three weeks back a patent was sealed for the following novelty (?). "Improved Flexible Photographic Positives" is its title. The specification is exceedingly brief, the descriptive part of it only occupies about twenty lines, and that is embodied in the one claim which is this: "Positive photographic prints transparent, colourless, or

coloured, obtained by superimposing the sensitive film upon thin colourless or coloured celluloid sheets substantially as described." In the specification no mention is made of any particular sensitive film, or method of making or applying it to the celluloid. The patentee of this "novelty" hails from Holland, and is described as a manufacturer, and the patent has been taken through an English patent agent.

ALTHOUGH the Patent Office take the fees and ask no questions, it is candid in the matter. Here is an extract from the circular of information it issues. "The patent laws of this country make no provision for an official search as regards novelty, and consequently British patents are taken out at the risk of applicants, who are expected to cause a search to be made as to the novelty of their inventions either before they make, or before they complete, their applications." "It is left to every person to protect his rights by opposition or otherwise. A patent is granted upon an application which passes the prescribed stages and is unopposed, whether the invention be novel or not." It is really astonishing that so many inventors take out patents without making any inquiry as to what has been done before, or as to their probable validity when obtained

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DIGRESSIONS.

No. XX.—Eyes and No Eyes.

EVERYBODY has got it now, or will have it, for it is published for a penny on every bookstall; but many must remember reading in their youth a simple little story, entitled *Eyes or No Eyes; or, The Art of Seeing*. Who was the author? Was it Dr. Aikin or Mrs. Barbauld, or which of the writers for the young folk, of whom there were many in the first half of the century? The new editor has omitted the name, and I am ashamed to say I do not remember it.

This little tale was read to me very early in my life, I saw it again many times afterwards, and have been haunted and helped by the memory ever since, but have never been fortunate enough to find a copy until I met with the recent reprint. I do not hesitate to say that I owe more to the extraordinary effect this tale had on my almost infant brain than anything educational that came afterwards, or was it the sound foundation it laid that directed the rest and made knowledge come easier?

The once familiar tale describes the experiences of two of the pupils of Mr. Andrews, who, like all the tutors of the period knows everything, and, like Mr. Barlow, in *Sandford and Merton*, would certainly be called "a bit of a prig" in the present easier times. He examines the young gentlemen on their return from their half-holiday walks. The one had seen nothing, thought it very dull, and would have preferred the high road to the green lanes. He had left his friend William in the lane. He was so tedious, always stopping to look at this thing and that. Robert had travelled from Dan to Beersheba, and found all barren. Then William arrives, overflowing with delight at his pleasant walk, and his handkerchief full of the treasures he has collected; and, I may add in a parenthesis, if he saw all that is set down in one afternoon, he was fortunate. He met with much variety of natural history and beautiful scenery, and has the pleasure of puzzling his not-often-puzzled tutor with geological finds, the cause of which was not understood at that time. The recital of these simple little experiences, and the talk over them cannot fail to interest even the learned reader. But Robert, who had no eyes or taste for these things, saw none of them. As Mr. Andrews gravely explains to him, "One man walks through the world with his eyes open, and another with them shut; and upon this difference depends all the superiority of knowledge the one acquires above the other," an observation that may be open to some little dispute, but near enough to the truth for our purpose.

It seems almost an impertinence to tell people they don't see; but, as a rule, it is true enough that few see five or ten per cent. of what is before them. Even our latter-day amusements, not open to Robert and William, and which it may be thought would lead to greater knowledge of nature, do not help us much; the photographer rambles through the country looking for the kinds of bits he has seen others take, to the exclusion of new ideas and individual treatment; the cyclist goes a great distance, but he cannot stop to observe, and usually seems too interested in the track before him to raise his eyes to the scenery around.

Doubtfulness as to what to take and how to take it is a main fault in amateurs. A habit of rapid observation is useful in counteracting this defect, and in making up the mind to act. There are many subjects that will not allow of much dilatory thinking. I may perhaps be permitted to give a personal experience. The other day, in Wales, I went out to photograph a castle, and returned home with every plate expended on a flock of geese. The castle could wait. My rule is never to depend upon accidents, but never to refuse them when they occur, and on this occasion, if that limited camera had held more than a dozen plates, I don't know where I should have stopped. To my mind this was one of the most interesting dozen I had ever exposed, but I had to use the camera more like a mitrailleuse (giving consideration, however, to every shot) than a hand camera, with the exposure elaborately thought, or over-thought, out. Yet, notwithstanding the quickness, it was not forgotten that there were such qualities as composition and expression, even in geese, for certainly in one case I made the gander swear, and the expression is amply expressed in the photograph.

The painter has the advantage over the photographer in being compelled to look at his subject direct. Photography takes people among natural scenes, and is said to induce a love of nature, but I fear it is, as I have said, to some degree antagonistic to a love of observation. The landscape painter *must* observe; it is not absolutely necessary that the landscape photographer should do so; that is, he can produce some sort of picture, as is every day demonstrated, without taking more than a very superficial glance at his object. Perhaps that is the real reason why so few photographs are nothing more than the usual thing. Want of observation, or want of the love and feeling for nature, which is created or assisted by observation, may account for much commonplace result.

The nature of his work compels the painter to observe, and I think it would be found that the cleverest of the sincere impressionists (I say nothing of those who impressed impression into their service as a business because it was a fashion, created by genius, but maintained by charlatanism) have had the kind of education that required the most minute observation. We all know the case of Millais and the pre-Raphaelites, who used to think they had done a good day's work if they had accomplished a square inch from nature in a day. In after-years Millais could paint an acceptable picture with a few strokes of the brush, thanks to the knowledge and skill his early and painful observation gave him.

Perhaps there were never pictures painted giving more the absolute verisimilitude of nature than the late Henry Moore's seas. He would begin and finish a large one in a few days, and used to say he could not get the breezy, healthy, open-air, spontaneous effect in any other way. He began his career with minute finish. I possess some drawings of plants and insects of his that are quite amazing in their minutiæ. He was a close observer of nature in many ways, and did not confine himself to what would be useful in his art. He painted to the last from nature, although he had so trained his habit of observation that he could remember a sea subject in all its details as it flashed on his retina, "engrossed by swift impress," as quickly as with the shutter of a hand camera. It has been said by good critics that his pictures were too like nature, or, what was perhaps more true, the art was hidden too completely.

Nothing but close study of the subjects met with will give the power of seeing them adequately, and nothing but the power of close insight will enable the artist in any material to represent them properly; if you want to see pictures, you must become acquainted with art. A technical photographer will sometimes produce a picture, often to his very great surprise; but, as a rule, they will only appear to those who know how to seek. If you want to see a moth or butterfly, you must know something of entomology to see them properly, or, indeed, at all. You may hear a bird singing if you listen, but it is only those who closely observe and note who could tell whether the song came from a thrush or a blackbird.

Photographers are much given to the use of note-books, but they are chiefly used for observations affecting the technical treatment of the plate. Less of these kinds of notes would be no detriment to their negative, but elaborate notes of the effects on their subjects would be much to their advantage.

In connexion with this subject may be mentioned a system of sight memory that I have found of great assistance. Here is a short outline of it. Look at a scene with a view to its pictorial possibilities, look at it as a whole and in detail, and fasten the facts in your mind. When you return home, make the best sketch of the scene of which you are capable from memory, and afterwards correct the sketch from nature. Carry the exercise still further by extending the time between looking at the scene and the sketch from memory until you can allow a month to elapse and still give a tolerable faithful memory sketch; you will then find you will be able to remember almost everything you see better than when your mind was little more than an uncultivated waste.

The habit of observation, besides being useful in camera work, may afford amusement on those days when the practice of our art is impossible. On a blank day as regards picture-making, when nature seems to resent being made picturesque, when the east wind blows, and all is dull and flat, not poetically melancholy, but, as is sometimes but fortunately rarely seen, "right down stupid," it is well to have the power to use other faculties, to hear and see the birds, and flowers, and insects, and the little unconsidered fur-clad dwellers in the woods, and fields, and streams. H. P. Robinson.

BACKED PLATES.

It is not often I am inclined to differ from my good friend, Mr. Henderson, on subjects photographic; but, with regard to his letter on collodion-backed plates, I can only say that I am amused at his amusement at the Editorial remarks on this subject, every word of which, as quoted from a correspondent referred to, I can heartily endorse. It is all very well for a retired veteran, who has earned his spurs, to spend leisure time in Monkey-branding his plate-backing, but, to a busy professional or his assistant, the waste of time alone involved in removing the collodion is simply appalling. I dare say Mr. Henderson had in mind a hand camera or a stereoscopic-sized plate—and there is nuisance enough even then in the work—but I am sure his amusement would be turned into wrath if he had to deal with plates of larger though even moderate dimensions. Let us say he returned home from a hard day's work with a dozen 12×10 negatives, and, after development, desired to remove the backing before retiring to his arm chair. I defy him to do the work under an hour's time, even excluding getting his materials together and removing and clearing up the *débris*. I know it, for I have been there myself.

Old wet-plate hands like ourselves are accustomed to stained fingers; but, nowadays, one is able to carry out one's preference for unstained digits. To remove this coloured collodion backing, even with water and an abrasive powder, there is enough staining to be a nuisance; while, if the old collodion solvents be used, the result is simply maddening. *Apropos* of the latter, I cannot resist repeating a joke against the travelling representative of the firm who have been sending out these plates, and who recently called upon me. He quite pooh-poohed the difficulty when I alluded to it, and said "a little ether and alcohol would get it all off in a minute." With a grave face, I replied, I felt it would take a longer time than that, but perhaps he would like to try. "Certainly," he replied. We went into the laboratory, and I prepared to get the necessary materials. "How much do you want?" "Oh, about an ounce of each." "All right, but that puts nearly a penny on each plate," I replied. He set to work, and by the end of nearly ten minutes' time he had removed about a third of the back of a 12×10. "That's enough," he said, "we will leave it at that; now, how must I get this stain off my hands" (they were well stained, back and front, with deep yellow)? I could only tell him there was no ready means; he might use a little ammonia, which would slightly reduce it, but in a few days' time it would wear away. I forgot to add that I had previously told him that we found a little very fine emery and water rubbed on with a piece of cotton-wool was the best way to remove the plate backing.

For very many years I have had almost all my plates for outdoor use backed, but I found that it absorbed so much time to do this on one's own premises that I asked one firm of manufacturers to do it for me, and for some time past they have done so for about a penny or less per plate; but I have never been entirely satisfied with their way of doing it, and have long impressed on them the desirability of using a black paper, made carefully adherent, in optical contact with an easily soluble or easily softened substance. First they used a red ochreous powder, which was unpleasant in the developing solution. Then they used orange paper, and the first batch they supplied I had to return, for it was only attached by its margin, the rest being non-adherent. Finally they gave way to me, and used black paper. This was very good when the plates were only a week or two old, but after a month or two it became so firmly attached that nothing but friction would remove it during the development when one wished to examine the negative by transmitted light. Hence, when I saw their collodion announcement, I was inclined to cry, "Eureka!" especially as I should not have to wait for the plates to be backed for me specially. But, alas for the vanity of human expectations! everything was admirable during development (there is not the slightest need to scratch the film to see the density, the wet collodion absorbs scarcely any of the dark-room light); but, when it came to removing the film, the remarks of the correspondent quoted by the Editor fairly represent my own experience. I may say that the very day of writing these remarks I have had half the prints in a batch of platinotypes stained by floating particles of the collodion, which my assistants have not entirely cleared up after cleaning a number of negatives. I may also say that already I have had two valuable negatives cracked under their hands during the cleaning process, although I had provided suitable pads of filtering paper for resting them on during the operation.

I think I have said enough to show the unsuitability of collodion, and I may conclude by informing the readers of the Journal that the Company who issue these collodion-backed plates are giving up the use of this kind of backing; they have written me that they are introducing a backing that will come off automatically during the process of development, and long before the operation is concluded.

G. Watmough Webster, F.C.S., F.R.P.S.

INTENSIFICATION SCREENS FOR X RAYS.

[Photographisches Wochenblatt.]

Starting with the assumption that the Röntgen rays do not act directly on the bromide of silver, but must be first converted by the gelatine or the glass into fluorescent light in order to be photographically active, it naturally follows that an intensification of the photographic action must ensue if the rays are converted into fluorescent light immediately in contact with the film. This was proved in April, 1896, by placing a screen of paper covered with platino-cyanide of barium in contact with the film. Although this action was recognised, yet it has found but little use in practice, but now such screens can be obtained commercially. One disadvantage of these screens is in the granularity of the film, since the platino-cyanide of barium only fluoresces when it has a particular crystalline form. The chemical factory of C. A. Kahlbaum, of Berlin, has now placed screens very evenly and thinly coated with a fine grained platino-cyanide, which give excellent results, but, of course, the platinum salt is still very high in price.

It is therefore advisable to try and find a cheaper material which shall be equal to platino-cyanide. Edison was the first to suggest a cheaper salt, the calcium tungstate, and in its native form of Scheelite it is an approximate substitute for the platino-cyanide. The Allgemene Electricitäts Gesellschaft, of Berlin, have placed on the market a screen prepared with this salt, and although the fluorescence of this screen is less than that of the other visually, it still increases the photographic action, and, since it fluoresces with a bluish-white light, ordinary dry plates may be used with it, whilst for the platino-cyanide, which fluoresces with a yellowish-green colour, erythrosine silver plates must be used. The grain of the tungstate screen is very prominent.

Lately Kahlbaum & Co. have introduced a tungstate screen, which not only possesses far greater fluorescent properties than the old form, but possesses scarcely any grain, an important point as regards the definition of the image.

In order to test the intensifying action of these salts, sheets of paper were coated with them, as well as with Dr. Melckebeke's double fluoride of ammonium and uranium, and strips were pasted side by side on a sheet of cardboard, measuring 13 × 18 cm. No. 1 strip was left bare, so as to determine the action of the X rays alone; No. 2 was the ammonium and uranium fluoride; No. 3 the calcium tungstate of the Electricitäts Gesellschaft; No. 4 Kahlbaum's tungstate; No. 5 Kahlbaum's platino-cyanide.

In order to determine the action of these salts on ordinary and other plates, a 13 × 18 plate was cut in two, and one half bathed in erythrosine silver, in order to sensitise it for yellowish green, and dried. The two halves were now placed, together with the above-mentioned compound intensification screen, in contact with the film, and then wrapped in a double thickness of black paper, and exposed for thirty seconds to the X rays in such a manner that they had to pass through the screen before reaching the plate. A coil of 10 cm. spark with rotating mercury contact breaker was used, and the tube was 25 cm. from the plate.

The deposits on the orthochromatic plate were numbered from 6 to 10 and the experiments were performed by Dr. Baurath.

On development, some interesting differences were noted, and the density of the deposits was approximately measured — not absolutely accurately, but still they give satisfactory conclusions as to the action. The following table shows the relative densities of the deposit, that without the screen on the ordinary plate being taken as unity. For No. 14 strip the photometer was too low, and the number is probably much too low in consequence :—

Without screen.	No. 1.	1·0	1·5	No. 6.
Ammonium and uranium fluoride.	No. 2.	0·5	1·0	No. 7.
Calcium tungstate (A. E. G.)	No. 3.	2·0	2·5	No. 8.
,, ,, (Kahlbaum).	No. 4.	4·3	5·0	No. 9.
Barium platino-cyanide (Kahlbaum).	No. 5.	0·5	14·0	No. 10.

From these figures a series of deductions may be drawn which will be important in practical work.

1. The orthochromatic plate shows a much stronger action over the ordinary without the screen, and they increase the action of all the screens. It is thus shown that, for X rays, only erythro-silver plates should be used. The increased action should be ascribed to the fluorescence of the erythrosine.

2. The fluoride of ammonium and uranium reduces the action of the rays to one-half on the ordinary plate, and to about two-thirds with the orthochromatic plate, and ought not therefore to be used for this work.

3. The calcium tungstate of the Electricitäts Gesellschaft doubles the action, and Kahlbaum's preparation quadruples the action on ordinary plates, and gives a yet greater action on orthochromatic plates.

4. The platino-cyanide screen gave a very interesting result. With the ordinary plate, which, as is well known, is very insensitive to yellowish-green light, there was no intensifying action, but just the reverse, the screen reduced the action by one half. From this it follows that this screen had converted the greatest part of the X rays into yellowish-green fluorescent light. The orthochromatic plate showed the most intense blackening of all.

By these extraordinary differences may possibly be explained the different opinions of others who had obviously used unsuitable plates. The blackening of No. 10 was so strong that it is obvious at the first glance that the use of a platino-cyanide intensification screen, but only with an orthochromatic plate, must be the most economical method of using the Röntgen rays.

As regards the granularity of the images, it was the same with all the screens with the exception of Kahlbaum's tungstate screen—Nos. 4 and 9, which only showed the grain of the plate itself. In No. 10 the density was so great that no grain could be discerned, but it was visible in No. 5. The cause of this phenomenon was due to larger crystals, which at some corners emit much more light.

The numbers here given have only a relative value, since probably other tubes would give discordant results; but still they give one a general idea, and allow us to formulate general rules.

The general result of these experiments is, that for visual examination Kahlbaum's platino-cyanide screen gives the best result, as well as the greatest action, in combination with an orthochromatic plate, which is sensitive to yellow-green. Kahlbaum's new tungstate screen is the best and cheapest substitute for the above, and has the special advantage that it can be used with an ordinary plate, and shows no grain in the image. Such a screen may be obtained for only 7*s*., or, in the form of a special slide, into which the plate may be placed, for 16*s*. 4*d*. J. Gaedicke.

THE PARIS PHOTOGRAPHIC SALON OF 1897.

II.

Amongst Mr. Howard Esler's four frames may be noticed No. 292 (*The Edge of the Pool*). It is a delightful little picture, which gives us at the same time the strength of an etched plate and the delicate effect of water colour. Impossible to do better of the kind. By the side of it the trivial lighting of the interior, No. 291, and the pretty, but scarcely original, composition of Nos. 290 and 293 are all the more striking.

The best of Mr. Hankin's three pictures is the portrait (No. 264). The two others show us the same model in the same costume, differing only by a slight movement of the head, and attract no attention. Further on are a charming landscape by Mr. Dawes, *A Thistle Field*, and a low-water effect against the light, *The Old Hulk*, by Mr. Job, which differ little from many other compositions of the kind. Very delicate are the three little landscapes of Miss Florence Watson, set in a key of black to grey, very pleasantly composed and with a good moderation in focussing.

Mr. Sutcliffe's collection is important in number, very interesting, and very varied in effects. It is pleasant to find a different idea in almost every example of this amateur's work, and to note that the interpretation in each is carried out to the last degree. The two portraits, Nos. 514 and 515, are lifelike, the only criticism which we might be allowed to make of the first being the really troubling want of drawing in the hand of the figure turning the pages of the book. The eye, passing rapidly from the definition of the head and bust, is startled and revolted by the puffiness of fingers without any outlines. Nothing of this kind appears in No. 515 (*Lulu*). The broad and truthful treatment is particularly attractive, but would not the artist have done well to suppress the much too strong lights on the right cheek and on the nose? *Fog* (No. 506) is most delicate in poetry. The masses of light and shade in *Port* (No. 512) are admirably managed, the tone and vibrating warmth in charming opposition to the soft tonality of its pendant, No. 507. A pretty study of sheep, a morning effect (*Pastoral*), and another fog very artistically washed in, as it were, are among the best numbers of this excellent collection.

The *Connoisseur*, by Mr. Chaffin, represents a white-bearded man examining by the light of a candle in full daylight a collection of coins. But why this lavish expenditure of light?

A delightful little landscape, with figure, by Mr. Walter Welford. The values are perfect to a degree. In spite of the small dimensions of the picture, we are given an impression of the soft and warm light which, no doubt, were present when it was taken. No. 563, analogous in idea, is pretty, but does not come up to the perfection of its neighbour. No. 564 is a charming little sketch with a stormy sky, which lowers, however, our estimation of its pendant, *Return of the Flock*, in which we find none of the qualities we have previously noticed.

Mr. Craig Annan continues to set us an example of quiet composition and quiet tonality, producing thereby a powerful and absolutely personal effect. Mr. Craig Annan is, without dispute, at the head of the artistic movement in photography. It is rare to see a position so rapidly and triumphantly acquired sustained with so much authority. His portrait, *A Lady in White*, has often been compared to a Terburg, and certainly one finds in it the qualities of the Dutch master. The folds of the dress are perfectly arranged—one can hardly find fault with the curved line in the stuff of it, formed by the back of the chair, which it covers, rather than by the figure itself. The value rendering of the dress is exquisite, in true relationship to the flesh tones of the face, the profile in full lighting separates itself without harshness from the dark background in which the hair of the figure is lost without being confounded, the accessories are quietly rendered; the whole picture has colour, warmth, and life. This portrait would suffice for Mr. Annan's reputation, but he does not stop there. In No. 137 we see him in another light, and he attempts, with success, one of the greatest difficulties of photography—the allegorical. To make one forget the personality of the model, the reality of the landscape; to address himself solely to the imagination of the spectator instead of confining himself to an appeal to memory; to succeed, in fact, in creating a dream by means of the most realistic method of procedure which exists—this is what Mr. Craig Annan has tried to do, and has succeeded in doing, but all the art and all the delicacy of an artist so remarkably talented as he is himself has been required to obtain this result, and I dread, in the years to come, the painful imitations of the tribe of plagiarists. This picture is entitled *The Church and the World*. The young girl in white, crowned with roses, seems to hesitate between the life of frivolity symbolised by her costume, and the rough road into which the two monks, in sombre habits

and with cowled heads, seek to lead her. It will be noticed that the tonality of the picture has purposely been kept in a low and uniform key; nevertheless, thanks to the white dress of the young girl and to the colour of the pony upon which she is seated, there is a necessary and very marked contrast between herself, personifying youth and gaiety, and the two monks, who are typical of serious and ascetic life. It is a triumph of the just relation of values which, with a uniform lighting, give to the eye a very strong impression of two masses of light and shade.

No. 136, *Eleanore*, is the result of a similar tendency. It is the paraphrase of the lines written beneath the print on the lower part of a very original and decorative frame:—

"As though a star in inmost heaven set,
So full, so deep, so low;
Thought seems to come and go
In thy large eyes, Imperial Eleanore."

The head of the young girl in ecstasy, the pose of the hand feverishly grasping the long tresses of hair, the clever arrangement of the background, the low, almost unreal, light, combine to give us very fully the impression which the artist has wished us to feel. This superb collection is completed by an excellent group of two young girls (No. 138), and a charming Venetian landscape, most original in simplicity of composition.

Mr. Sinclair's three pictures are altogether different from the low tonality generally adopted by his compatriots. His *Lake Lugano* is filled with light, the colour warm and transparent, and the high note formed by the white cap of the woman washing clothes in the foreground is thoroughly well imagined. His *Dutchwoman* is extraordinary in strength of tone, in full light. The *Décadent* is less to my liking—the wall has lost texture, the high lights are violent rather than luminous. Altogether, this little humorous piece has been scarcely raised in treatment to the level of a work of art.

Five little frames by Mr. Barron. *The Mower* is naturally posed, the sky quiet, and not so violently artificial as in the other two. Mr. Croft sends four pictures. Two nudes (a bust and an "altogether") do not appear to us to offer much evidence of artistic effort. The landscape, *A Bad Road*, is pretty, simple, and restrained. Mr. Smerdon Roe's landscape (No. 500) is pretty, somewhat trifling, but altogether spoilt by the introduction in the foreground on the left of an unimportant and confused figure. One cannot help feeling that this little fisherman is only fishing for the sake of the camera. Of the three landscapes by Mr. Keene (Derbyshire scenery), Nos. 318 and 320 are charming, contrasts well managed, the composition straightforward and not petty. No. 319 doesn't give what was offered by nature; the complication has been exaggerated by the lens, the result is mixed up.

Three mist effects in miniature by Mr. Grove are very interesting, giving an impression which one would have hardly expected to get in so small a size. No. 225 is particularly interesting; the little luminous point of sunlight alone makes the whole picture. Mr. Ashton has made a speciality of Oriental subjects. We should be grateful to him for having succeeded in producing for us artistic photographs of scenes which, until now, had furnished by means of the camera nothing more than "documents," with hard and unpleasing contrasts, tiresomely dry, without colour or warmth. *The Pyramids, Evening*, is dramatic in its effect; and Mr. Ashton, breaking away from the conventional rendering of Eastern skies, has dared to give us clouds, an innovation which has roused in the English papers the incredulity and indignation of stay-at-home tourists. The lighting of *One of the Faithful* is brilliant without being hard, the colouration rich and warm, the effect particularly successful. I like less *The Hour of Prayer*, perhaps on account of its more uniform lighting and of the greater importance given to the architectural side in comparison with the proportions of the figures.

Rain and Wind, by the Rev. F. Lambert, a landscape in the dramatic style, is a very truthful impression, in spite of the too intense colouration of the tree foliage, which, to the exclusion of the lower part, has participated in undue measure in the printing of the added sky. No. 326, *Wind*, is a little *chef-d'œuvre*. The masses are cleverly contrasted, the figure of the woman gives just the necessary point at exactly the right spot; it is the only black note of the picture, and is well placed. In principle, we regret the admission of photogravures into an exhibition of pictorial photography, the personality of the artist being in part replaced by that of the etcher. Mr. Lambert is, however, "hoist with his own petard," for the etching which he has sent us is very bad, and, if one may judge by the others which he has contributed, the original print was probably much superior to this hard and inharmonious transcription.

The subject of Mr. Wilkinson's, *Mise à la Mer*, is not new, and the interpretation, careful and correct as it may be, fails to add much interest to it. Farther on are four landscapes, by Mr. Brownrigg, nice in feeling, No. 94 especially, being lit in an interesting manner. Two head studies, by Mr. Cruwys Richard, Nos. 155 and 156. The latter would be perfect if the right shoulder of the figure were more in evidence; there should, at least, be an indication of it.

The landscape (No. 372) by Lord Maitland is difficult to understand. Of what kind are the huge leaves which are grouped on the left hand? If Lord Maitland was trying for a decorative effect, he seems to us not have been successful, the long-drawn-out triangle of this mass of vegetation being hurtful to the composition rather than the contrary. On the other hand, the exaggerated fuzziness in No. 373 diminishes in nothing the somewhat trivial character, and has the fault of entirely destroying all difference of texture between such dissimilar things as flesh, background, and stuffs. No. 374 is pretty.

The *Wrecks*, by Mr. Taylor, would certainly have attracted attention a year or two ago, but nowadays will pass almost without notice amongst the crowd of similar effects which fill our Exhibitions. Mr. Thomas's *Winter Morning* is somewhat in the same category. It is a pretty little picture, in a soft-grey tonality, but it has too many *confrères* in the English school to make itself especially remarkable.

Amongst Mr. Horsley Hinton's five pictures, faultless in surety of execution, we may place first *Requiem* and *On Feldee Shore*. Possibly this preference may be due to the fact that they recall less than the others the previous work of this artist. Any how, the peculiar poetry of *Requiem*, and the fine effect of light in *Feldee*, count for something in the matter. In our Exhibitions the public is always desirous of being able to see as a whole the contributions of each exhibitor. Mr. Hinton's are, therefore, hung side by side, and we regret this, feeling sure that they would gain by a separate examination of each. There is in them a similarity which is apparent only, but which incontestably injures the *ensemble* of this very remarkable collection.

Mr. Ralph Robinson shows four very interesting landscapes. At the head of them I may name *A Village by the Sea*, of a great simplicity in composition and as true in effect as it is powerful. Notice how little necessary is the introduction of an angry and dramatic sky for the obtaining of a fine natural effect. The sky of this landscape is throughout of a light grey. A few luminous streaks suffice to give it atmospheric depth; in fact, it lights up the landscape, and one feels that the light which bathes it really comes from the sky. The effect would appear to be as easy to get as to describe, but a glance at the greater number of the landscapes which we see exhibited will prove the contrary. No. 461, *Ebb Tide*, in a lower key, with shadows of fine quality, is admirably arranged, from the point of view of masses of light and shade. In No. 459 we have the decorative silhouettes of a group of storm-blown trees in a flat and desolate landscape. In *Fresh from the Ebbing Tide*, the values of sky and sea, possibly on account of the different colouration, appear to form see-saw, and the clouds are well to the front. The general effect is, however, very striking.

Of two nice prints by Mr. Bolton the *Calm River* answers well to its title; in *L'épave*, by Mr. Smedley Aston, the sky is remarkable, though we regret the importance given to the foreground in relation to the subject of the picture. Such a criticism would be misplaced if applied to No. 499, which is called *Foregrounds*. All the same, we can scarcely believe that the eye can take in so wide an angle as the lens which Mr. Aston seems to have used.

Mr. Atkinson has been so much taken with the fine effects of blue smoke in his *Weed-burners* that he shows us scarcely anything different in No. 10 *bis*. He has forgotten that the smoke in question only forms the motive of the picture in the framework of the landscape, by means of the contrast of colour and line and by its form, in opposition to the strongly drawn lines of the ground itself and the background. He allows us to see one portion only of what he has seen, and the title is necessary in order that we may understand the subject. I like better Mr. Marsh's enlargement, *Gas*, in which the smoke rolls in broken-up bits amongst the black and rough materials of the retorts. We have here a contrast which is lacking in the work of Mr. Atkinson.

Mr. Crookes' collection is undoubtedly one of the most remarkable in the English division. We find in it, at a glance, two entirely different manners. Two portraits (Nos. 152 and 153) are treated in the style of the old steel engravings of the *Keepsakes*. The arrangement of the margins, of the lettering, and of the frames show, in fact, that this resemblance is not the result of chance; on the contrary, the portrait of Miss MacFarlane and the large portrait of a lady are entirely different in manner and colouration. Very interesting and profitable to study is the portrait of Alexander Curle. The quality of the blacks is surprising by the side of the warm and transparent half-tones. The pose is most natural; not for a moment is the idea given of the lens fixedly regarding

the sitter, and the simplified treatment of the hands is remarkable. The picture hanging on the left is perfectly well placed; it clears the background without bringing into it too high a note. We have here, indeed, a really fine work. The portrait of a lady is also fine, but it has not obtained so much success as the other, in spite of its incontestable qualities of composition. The tonality a little too even of the forehead, the cheek, the neck, and the bosom is continued by the whiteness of the fichu and the flowers; one fails to find in it the warmth, the softness, and the modelling so remarkable in the superb portrait of Miss MacFarlane, charming in its youth and freshness.

We regret to be unable to do more than name Mr. Palmer, whose *Rainy Day in London* is cleverly arranged; Mr. Craigie, who sends us two heads in very diffused focus; Messrs. Dean, Dodson, Duplessis, Barron, Ellis, Emanuel, Goldie, Harrison, Howell, and Norrie. We must regret also to have had no opportunity of speaking of Messrs. Walter Colls, H. P. Robinson, Calland, Cadby, and others, whose talent we know and appreciate. Let us hope that their abstention will not be continued next year. ROBERT DEMACHY.

CONCERNING HALATION AND SOME ANTIDOTES.

II.

VARIOUS CURES FOR HALATION.

FROM a consideration of the previous article it will be gathered that, although halation is in a large measure curable, there is no one remedy which is, under all circumstances, efficacious. The antidotes to halation may be broadly grouped into three main divisions:—

(1) Plates.
(2) Manipulations regarding exposure and development.
(3) Backing.

Taking the above in the order given, where a choice amongst ordinary plates is available, the best plate is a slow, thickly coated one; if it has been dyed for isochromatising purposes, so much the better.

Besides ordinary plates, there are now procurable other kinds, specially made to counteract the native tendency to halation met with. Of these the oldest and best known is the Sandell multiple-coated plate. This depends upon the principle already alluded to, *i.e.*, that a thick and non-actinic film will effectually suppress such light as might otherwise, by reflection from the back of the glass, bring about the injurious effect under consideration.

In order to ensure this, the glass is first *thickly* coated with a slow emulsion; this transmits mainly light of low actinic value, and of that so very little that one may almost neglect it. Upon the the top of this first coating *an extra-rapid emulsion* is spread. On exposure in the camera the actinic rays which form the high lights of the image, and which pass through the uppermost film, are nearly all absorbed by the lower one, and, moreover, imprint upon the lower film an image which, if needful, can be developed up so as to strengthen, or entirely replace, the image upon the uppermost film. From this brief description it will be gathered that there is but little chance that any possible harm (due to halation) can befall a negative whilst using the above plates.

For cases where the risk of halation is unusually great (such as sunshine upon a clear glass window) a triple-coated plate is provided. In this case the under coat is of an emulsion similar to that used for transparency work, and is one which absorbs nearly all but the red rays. Where an ordinary exposure has been given, any developer may be used, the development being best judged by an examination of the plate by reflected light, as the great thickness of the film makes it, at times, difficult to judge by *looking through*. Another method to pursue is to develop by time, *i.e.*, observe the appearance of the high lights, and, using a suitable factor, which depends upon the developer employed and upon the printing quality desired, leave the plate in the dish until the time is up. Thus, if the high lights appeared in one minute, and the factor employed were seven, the plate would be done in seven minutes. Where, however, as is sometimes the case with a considerable over-exposure, one is aiming to develop the image upon the second film, a somewhat prolonged development is called for which is not subject to ordinary methods of either examination or judgment.

In such a case the best course to pursue is to employ a weak metol solution, and, leaving the plate in it for an hour or two, fix without washing; if, on examination after fixing, the negative, as is probable, is on the side of over-density, reduce it to the required amount by immersing it whilst still saturated with hypo for a minute or two, more or less, in weak solution of ferricyanide of potassium.

Another make which has gained considerable approval for its anti-halation quality is one brought out a few years ago by Mr. Oakley. In this it was sought to solve the problem by applying a stain between the sensitised coating and the glass, the active principle employed being potassium permanganate. This certainly very effectually cut off such light rays as would be likely to do harm.

As regards manipulatory precautions against halation, experience indicates that, other things equal, the worst cases of halation ensue where under-exposure has been given.

Prolonged forcing of a much-under-timed plate is apt to change what would otherwise be merely a slight trace of halation into a very pronounced case. It is here convenient to describe the following method for reducing contrast in a negative the effect of which will be to nullify the evil results of slight halation. Having ensured the total elimination of hypo, soak the negative until it is soft in—

Potassium bichromate	10 grains,
Potassium bromide	20 ,,
Water distilled	2 ounces;

then pour this off, add about five drops of nitric acid, and reflow the mixture over the plate, which should then bleach thoroughly, wash, immerse in potassium metabisulphite one to twenty of water wash again, and develop with—

Pyro	2 grains,
Ammonia	2 minims,
Water	1 ounce,

until the shadows show from the back that they are developed, the high lights remaining apparently unaffected. Directly this stage is reached, at once fix in hypo, and wash as usual. The above is due to Mr. McIntosh, and further detailed instructions upon the procedure necessary are to be seen in the Transactions of the Royal Photographic Society. Whatever may be the exposure given, where the subject is one which seems to threaten halation, use a developer in which the pyro, or other similar developing agent, is small. A strong, heavily restrained developer, such as would produce a hard negative, is sure to aggravate any incipient halation.

As already stated, it is inadvisable to delay development after exposure.

BACKING PLATES.

The most largely used antidotes to halation as yet availed of in ordinary practice have been various applications to the back of the plate, either by the makers or by the photographer. Quite recently several brands of backed plates have been put upon the market, all of which appear to be eminently serviceable for the purpose in view. Thus the Paget plate has upon the glass a coating of orange collodion, which the writer has found to be in many respects very satisfactory to use. It is absolutely clean and free from every suspicion of causing dust, and does not affect the developer by mixing with it, nor does it greatly interfere with the judgment of the correct density when viewing the plate by the transmitted light of the ruby lamp.

The photographer should, however, make a slight allowance for the extra vigour in the shadows which the backing lends to the plates. Fixing and washing proceed as usual. Whilst the plate is still wet the collodion backing should be scraped off. The best way of doing this is to put the negative, with the gelatine film down, in a retouching desk-holder, or in any other frame which will just support it by the edges. A spoilt plate may then be used to plane off the collodion from the back. The collodion should be entirely removed with this and with a cloth, and the plate be then set aside to dry. Ether has been recommended to help in removing the collodion, but the writer much prefers the before-mentioned method as being both simpler and safer.

Other brands, such as Edwards's, and the Imperial, have backings which are more or less soluble in water. These are either removable with a wet sponge before or after development, or allowed to come off in the developer. Preparations applied to the plate by the photographer take various forms. Most widely used is probably the sienna and caramel backing. This can be obtained in convenient form ready mixed. Thus Powell's anti-halation backing is a good standard preparation, put up in shilling tins, which may be relied upon. Of similar value and efficacy is Forester's patent backing, which is conveniently sent out in a collapsible tube, such as oil colours are contained in.

Those who prefer to make their own backing should proceed as follows: Take enough of powdered caramel to make a thick cream when mixed with a quarter of a pint of water, to this add a few drops of glycerine. The use of the glycerine is to prevent the mixture getting "bone dry," in which condition fine dust is apt to come off, and, settling upon the front of the plate, produce pinholes.

Some consider that burnt sienna is an improvement to the caramel; in

which case equal parts by weight of gum, caramel, and powdered burnt sienna form a convenient mixture.

In applying the above the course usually adopted is to place the dry plate face downwards upon a clean, soft material, a blotting pad answers very well; pour a little of the backing on to the centre of the plate, and spread with a piece of cloth, a brush, or a squeegee, according to the consistency and make of the backing. Another, and perhaps the best way of all, is to pour a little of the backing into a saucer and dab it on with a "dolly;" this last is made of a piece of chamois leather stuffed with cotton-wool. The backing should be allowed to dry before being put into the dark slide.

Some people clap a sheet of paper on to the wet backing and straight away put the plate into the slide. This is not to be recommended, inasmuch as a damp atmosphere is liable to form around the plate, which is calculated to be inimical to the efficacy of the sensitised gelatino-bromide film.

Another method of killing reflection from the back of the plate is by using paper or some other substance which is in "optical" contact with the glass. By "optical" is meant *complete* contact, in the sense that no air should be shut in between the glass and the backing. The index of refraction of the backing should also be as nearly as possible the same as the glass.

No absolute accuracy as regards this point, however, seems necessary, providing that the paper, or other application, is capable of absorbing all, or most, of the actinic rays.

Various makes of orange papers are commercially put up with one side gummed; these are damped and rubbed in to complete contact with a squeegee. Should any part of the paper not be in actual contact, upon development a patch will appear upon the negative slightly darker than the rest of the film, due, of course, to the fact that the light rays, instead of being absorbed, are, more or less, reflected from the back, and hence the film, at that particular portion, has received more exposure than elsewhere. Those who like to prepare their own backing paper can do so by covering brown paper, cut to size, with a mixture of gum, glycerine, and burnt sienna, thinned with water.

Another device, which is extremely handy and free from all messiness, is the *Prosser-Roberts anti-halation pad*. This is composed of a sheet of waterproof cloth, one side of which is coated with a thick soft layer of a black pigmented gelatinous substance. The pad is squeegeed to the back of the plate before exposure, and is readily stripped off before development.

These pads can be used for many plates in succession, and keep well for years. In using them it is needful to ensure that no air bubbles are enclosed between the backing and the glass.

Reverting to plates, which are backed with burnt sienna and caramel, and with similar preparations, it should be said that many practitioners are in the habit of removing the backing with a wet sponge before proceeding to develop; this is, no doubt, a wise precaution, at the same time a large proportion of photographers never trouble to remove the backing, but let it wear off during development. Many negatives which the writer has examined seem none the worse for the addition to their developers of this foreign matter. None the less, one cannot be too cautious in introducing mixtures which may have a harmful physical or chemical effect either upon the negative or upon the developer.

Furthermore, it is to be remembered that, unless the backing be removed before developing is proceeded with, very great difficulty may be met with in gauging the correctness of development. The usual methods relied upon for finally deciding to stop development, *i.e.*, examining the ghost image on the back, and judging density by looking through the plate, are unavailable where caramel and similar preparations, which are daubed or brushed on to the back, are availed of. The irregular density of the backing effectually prevents one from forming a judgment as to the relative opacities of different parts of the image.

As far as the writer's experience and information go, the most desirable of backed plates are those sent out with an orange collodion backing. These combine cleanliness with the ability to judge densities by means of transmitted light, and contain nothing likely to injure any of the solutions. The only addition to the ordinary work attaching to negative-making is scraping off the backing, which is a perfectly easy and not very lengthy operation. HECTOR MACLEAN, F.R.P.S.

WHOLESALE PRICES FROM 1851 TO 1896.

HAVING attempted, in a former article (June 25), to tabulate the retail price of photographs from 1839 onwards, with the purpose of arriving at a comparison of the state of commercial photography at different times, I now intend to carry the subject a step further by dealing with wholesale prices, that is, the prices of material and other things that enter into cost of production as working expenses, apart from wages, leaving wages for separate treatment. As with retail prices, owing to a lack of matter, this is not readily done, the desired information being in private hands, and the little available in public libraries involving considerable research amongst dusty volumes to bring it to light. Commercial knowledge of this description is supplied for the passing hour, and only preserved by accident at the end of bound volumes in the form of advertisements. When, therefore, no efforts have been made to record current prices in the trade journals, or in a permanent form, very little survives after ten or a dozen years. It is curious how completely the facts are lost, for in one of the best collections of photographic books in the kingdom, containing almost the whole photographic literature of importance, I have failed to trace a scrap of information for the years from 1863 to 1880. Very few books were published during this period, and the bookbinders carefully removed the advertisement pages from publications like THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, which contain a wealth of trade details. Since 1880, however, the crop of photographic literature has been abundant, surpassing in amount that of the previous forty years; price-lists and trade handbooks are now stacked in many libraries, and the future investigator is likely to suffer from a surfeit rather than a dearth of material.

A history of wholesale prices cannot well commence before 1851, as until then the photographic dealer, having a separate existence from the chemist and optician, was scarcely established. In the census of that year only fifty-one professional photographers are enumerated, the demand for photographic material was still small, and hardly of sufficient importance to create its own independent prices.

The price of apparatus and appliances has not been tabulated, these being charged upon capital, and, beyond wear and tear, not entering into working expenses from which profits result. The price of apparatus does certainly affect profits indirectly by its influence on competition, for instance, in 1851, cabinet printing frames were priced at from 1*l.* to 6*s.* Presuming prices ruled on the same scale at present, considerable capital would be needed to start a business, and the profession would be closed to a considerable number of small capitalists.

The rapid progress that has taken place in photography is a difficulty in the way of an exact comparison of prices, because of the consequent change in processes, materials required, and business needs. In the early years glass plates were a serious item of expenditure. Since the introduction of gelatine dry plates they have become but a small percentage of cost of production. Other things have entirely passed out of use; thus gallic acid was in every list in 1852, now it is not quoted in the price-lists of photographic dealers. A strict comparison between the earlier and later years cannot therefore be made; it only remains to enumerate the articles of greatest importance at each period, and balance their relative costliness. After 1886 this difficulty disappears; from that time until 1896 a close comparison is possible.

Besides material, it is necessary to consider rent, rates, and taxes that enter into working expenses, their rise and fall altering the relation between retail prices and profits. Photographic rent in the various years should be obtained from an average of individual cases, the figures from official sources being of too general a character to meet a particular case, such as the rent of photographic premises. It is certain that rents of every description have gone up enormously; according to Giffen, 130 per cent. for small houses between the years 1837 and 1887. Another estimate for rents of all kinds gives the increases as twenty-two per cent. for the ten years from 1875 to 1886. The rise of rent given in the table is under rather than over the actual increase in rents. Rates and taxes also cannot be derived from official sources with any approach to the truth. Both rates and taxes show an upward tendency; according to one authority, all rates have increased as under:—

	s.	*d.*	
1841	2	7	in the pound.
1868	3	4	,,
1874	3	4½	,,
1891	3	8	,,

By another estimate the increase was:—

44 per cent. from 1841 to 1868.
13 ,, 1868 ,, 1880.

The only photographic account I have secured compares as follows:—

	1886.	1897.
Rent	60*l.*	100*l.*
Rates, taxes	25*l.*	40*l.*

an increase of thirty per cent. would thus be an average estimate for rates and taxes.

The accuracy of all quotations of prices depends on the larger or smaller quantity of data from which they are averaged. In 1886 gelatine dry plates were quoted at from 1*s.* to 2*s.* 4*d.* for quarter-plates, and 2*s.* 3*d.* to 5*s.* 3*d.* for half-plates per dozen, the average of 30 different brands coming out as in the table. Taken from a number of quotations such as 30, the price arrived at may be regarded as a safe approximation

to market rates, whereas isolated examples, as 5*s.* 3*d.* for a dozen half-plates and 1*s.* for quarter-plates, err considerably from general rates. The prices of chemicals do not require this careful compilation, because the price in one list varies but little from that in another, level prices being general amongst dealers in chemicals. In the table, when a number of quotations could not be obtained, the medium price has been put down, leaving it open to correction and addition.

	1851.	1852.	1856–60	1862.	1876.	1886.	1896.	Decrease per cent.	Increase per cent.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*		
Rent	100 0 0	102 0 0	116 0 0	120 0 0	140 0 0	160 0 0	180 0 0	...	80
Rates, taxes	30 0 0	30 10 0	32 0 0	33 13 0	35 6 0	36 15 0	39 0 0	...	30
Coal (wholesale, ton)	.....	.....	0 19 0	0 10 0	0 11 0	0 8 4	0 14 0	—	—
Gold chloride, 15 grains	.....	0 3 6	0 2 9	0 2 6	.....	0 2 0	0 1 9	50	—
Silver nitrate ..... 1 ounce	0 5 0	0 5 0	0 4 6	0 4 6	.....	0 3 6	0 2 6	50	—
Collodion ..... ,,	0 2 0	0 1 0	0 0 9	0 0 9	.....	0 0 6	0 0 6	75	—
Pyrogallic acid..... ,,	1 10 0	1 10 0	0 6 6	0 4 9	0 2 6	0 1 2	0 1 0	96	—
Acetic acid ..... ,,	0 1 0	0 0 8	0 1 0	0 0 2	.....	0 0 2	0 0 2	83	—
Gallic acid .... ,,	0 3 6	0 3 6	0 1 6	0 1 0	0 0 9	0 0 6	0 0 4	90	—
Potassium bromide ,,	0 4 6	0 4 0	0 2 0	0 1 6	0 0 5	0 0 4	0 0 3	95	—
,, cyanide ,,	0 0 8	0 0 6	0 0 3	0 0 3	.....	0 0 2	0 0 2	75	—
Hyposulphite soda ,,	0 3 6	0 0 3	0 0 1	0 0 1	.....	0 0 3*	0 2*	—	—
Ammonia ..... ,,	0 0 3	0 0 3	0 0 2	0 0 2	.....	0 0 1	0 0 1	66	—
Gelatine ..... ,,	.....	.....	0 0 6	0 0 4	.....	0 0 4	0 0 4	33	—
Mercury ... . ,, ...	.....	0 0 4	0 0 3	0 0 3	.....	.....	0 0 4	—	—
Daguerreotype plates, $6\frac{1}{2}\times4\frac{3}{4}$, dozen ...	.....	3 6 0	3 1 9	.....	——	——	——	—	—
,, ,, $4\frac{1}{4}\times3\frac{1}{4}$, ,, ...	.....	1 12 0	1 10 4	.....	——	——	——	—	—
Glass ,, $6\frac{1}{2}\times4\frac{3}{4}$, ,, ...	.....	0 8 6	0 3 6	0 3 6	.....	.....	0 3 6	60	—
,, ,, $4\frac{1}{4}\times3\frac{1}{4}$, ,, ...	.....	0 5 6	0 2 0	0 1 3	.....	.....	0 1 0	80	—
Collodion dry ,, $6\frac{1}{2}\times4\frac{3}{4}$, ,, ...	.....	.....	0 8 6	0 9 0	.....	.....	0 3 0	64	—
,, ,, $4\frac{1}{4}\times3\frac{1}{4}$, ,, ...	.....	.....	0 5 6	0 5 0	.....	.....	0 1 3	75	—
Gelatine dry ,, $6\frac{1}{2}\times4\frac{3}{4}$, ,, ...	.....	.....	.....	.....	.....	0 3 0	0 2 3	25	—
,, ,, $4\frac{1}{4}\times3\frac{1}{4}$, ,, ...	.....	.....	.....	.....	.....	0 1 4	0 1 0	25	—
Albumenised paper, quire	.....	.....	0 12 0	0 8 0	0 6 0	0 7 0	0 6 3	49	—
Positive ,, ,, ...	0 4 6	0 4 6	——	——	——	——	——	—	—
Mats $6\frac{1}{2}\times4\frac{3}{4}$ dozen	.....	.....	0 6 0	0 0 6	——	——	——	—	—
,, $4\frac{1}{4}\times3\frac{1}{4}$,, ...	.....	0 5 6	0 1 3	0 0 3	.....	0 0 $3\frac{1}{2}$	0 0 8	—	—
Preservers $6\frac{1}{2}\times4\frac{3}{4}$,, ...	.....	.....	0 4 0	0 3 0	——	——	——	—	—
,, $4\frac{1}{4}\times3\frac{1}{4}$,, ...	.....	.....	0 0 10	0 0 6	.....	0 0 $4\frac{3}{4}$	0 0 8	—	—
Passe-partouts, cabinet ,, ...	.....	1 0 0	0 8 6	0 8 0	——	——	——	—	—
,, ,, C.D.V. ,, ...	.....	0 10 0	0 4 0	0 4 6	——	——	——	—	—
Mounts, cabinet, 100	.....	.....	.....	.....	.....	0 3 7	0 3 8	—	—
,, C.D.V. ,, ...	.....	.....	.....	0 1 4	.....	0 1 4	0 1 4	—	—

* Per pound.

On examining the above table, it will be noticed that not a single article has risen in price, the fall being general for manufactured goods; individual cases, such as hyposulphite of soda, and pyrogallic acid, to a remarkable extent. Another feature brought out is that the price of articles tends downwards to a natural level; thus mercury and gelatine have varied the least in price, because they had already been forced down, whilst pyrogallic acid and hyposulphite of soda, being of recent demand, created by photographers, dropped quickly, and are still falling. They have, however, approached the limit and their price will now remain steady, provided no improved method of manufacture is discovered.

From 1851 to 1861 pyrogallic acid fell from 1*l.* 10*s.* to 4*s.* 9*d.* per ounce, from 1886 to 1896 from 1*s.* 2*d.* to 1*s.*, showing that it is slowly nearing its limit. Taking fourteen articles, the decrease ranges from forty-nine to ninety-six per cent., the average being seventy-two per cent. Against this decrease has to be balanced the increases of eighty and thirty per cent. in rent, and rates and taxes, the only items that have steadily risen.

The full import of these figures cannot be stated until wages have been considered, and the percentage that every item enters into cost of production compared with the percentage of its increase or decrease in price as the case may be. In a future article I hope to draw up a comparative statement of the rate of wages during the last few years.

JOHN A. RANDALL.

TECHNICAL EDUCATION IN RELATION TO PROCESS ENGRAVING.

[Abstract of paper read before the Society of Arts.]

CANDIDATES for the Honours stage in Typography at the City and Guilds of London Institute examinations are required to possess a general knowledge of the subjects of electrotyping and stereotyping, but no intimate acquaintance is presupposed with the details, nor is it necessary in the case of typographical candidates. Such papers constitute at present the only recognition of these subjects in any series of technical or technological examinations.

With regard to process work there is quite a different story to tell. In comparison with its age, probably no craft is at the present time so well provided with facilities for efficient technical instruction, at any rate so far as London is concerned. The numerous processes of engraving which are founded upon photography have all been introduced into this country within the last twenty-five years. For the first half of that period no substantial progress was made and the productions of English process workers compared unfavourably with those obtained abroad. The methods which involved a combination of lithography with pure photographic operations (such as collotype) were relegated to comparative obscurity—those which were capable of being used in conjunction with letterpress printing might, for their intrinsic merits, have shared the same fate but that a combination of circumstances compelled development. The two most important factors in determining this development were the great increase in the number of illustrated newspapers and magazines and the rapid spread of a general interest in and pursuit of photography and pastime. The earliest workers in these letterpress printing processes were mostly French refugees who found an asylum here after the political troubles of 1871. These men in turn were set to train youths who were employed without any reference whatever to their aptitude for the somewhat delicate operations they were to perform. There was no selection, no recognised system of apprenticeship, no particular inducement was offered to the workman to efficiently teach his assistants, and in the result a number of workmen were engaged in the trade who had a rule-of-thumb method of working, but who had no acquaintance with the principles upon which the various stages of their work rested, and who consequently carried their performances to a certain level, but were unable to get beyond. To these succeeded a rather superior class, men who had been through a course in photography, at some one of the Polytechnics where the subject was taken, and so possessed the rudiments of a technical training. With the introduction of the more elaborate half-tone processes which were to supplement, and which are bidding fair to altogether supplant, the old line processes, the need for more highly organized and more completely specialised training became pressing. While in the main one general idea was followed, in detail a very varied practice prevailed. Consequently much confusion arose whenever an alteration occurred in the *personnel* of the staff. A new comer had probably been trained under different conditions, and the employer frequently had to choose between preserving the traditional practice of his workshop, or adopting the innovations suggested by a more or less varied experience elsewhere. No test could be applied and the value of an innovation could be determined only by the result.

The rapidity with which the importance of the industry had grown, and the fact that many of the institutions which had originally devoted some portion of their energies to the fostering of a really efficient

technical instruction in photography had found in course of time that their efforts were, from lack of pure directness of purpose, calculated only to encourage the amateur, induced the Technical Education Board of the London County Council to take the matter in hand, and to provide what should prove to be a really efficient technical school, working under conditions which should meet the requirements of the case. Premises in Bolt-court, Fleet-street, formerly used by the Stationers' Company of London for their day schools, were placed at the disposal of a joint committee composed of members of the Technical Education Board and of the National Society of Lithographic Artists. These were altered and adapted for the purposes intended, and were fitted with a modern equipment of adequate capacity. Of necessity, the school was allied with art classes of the ordinary description. The class teaching has been graduated so as to present a very comprehensive view of the subjects dealt with and is so arranged that the maximum number of students present does not exceed the number which can be properly dealt with at any one time. This limitation of number is always desirable; too little regard is paid to it generally in commercial or literary subjects, and in pure and applied science; but in technology its importance cannot be overrated, for the constant contact between teacher and pupil is absolutely essential.

Besides the ordinary class teaching, opportunity is afforded to facilitate as far as possible the progress of students by allowing those who have reached a certain standard to attend the school for independent practice.

Originally the classes were open only during the evening, but for the past eighteen months they have been also at the disposal of students during the day time; the fees are moderate, and are certainly within the means of any member of the trade desirous of joining the classes.

The complete course of instruction at present arranged deals with the production of negatives and positives for the various photographic processes, with the transfer of the image on such negatives so as to prepare printing surfaces; with the making of photo-litho transfers, and with the preparation of collotype films ready for printing. For the "relief" or letterpress process the work is continued through the various stages of etching and fine etching until the completed block is produced ready for the printer. At present the course stops short at this point, but it would be advantageous if room could be found for the necessary appliances to add to the equipment so as to secure a really sound training for those workmen in the trade who are engaged in the final operations of clearing up and mounting the blocks. This part of the business is at present somewhat neglected, and it might be arranged for as a special department of the work to be undertaken in connexion with electrotyping. Although comparatively speaking a detail, it is yet a very important one, and in one's daily experience it not infrequently happens that blocks upon the preparation of which a great deal of care and attention have been expended are damaged, if not wholly destroyed, by careless mounting. Since the introduction of half-tone work of finer grades than formerly prevailed, more delicate surfaces have to be handled, and the need of greater attention to this matter is imperative.

Notwithstanding the fact that the provision of adequate facilities must in this as in all other industries be a work of time to impress upon the average English workman the benefit which he will derive in his ordinary daily occupation from attendance at a technical school, it is satisfactory to learn from the last report of the London County Council Technical Education Board that during the past years ninety-seven individual students, of whom nearly two-thirds were actively and directly engaged in the process trade, joined these classes. The remaining thirty-seven students, consisting of artists, lithographers, and letterpress printers, were also intimately concerned with the subject. The teaching is above all things practical, and the amateur, as such, is sternly repressed. In the various departments into which the work is divided there were altogether 164 entries. Looking to the results obtained, the cost of equipment and maintenance is extremely moderate.

Although London is the principal centre of the industry, the influence of the school is likely to be far-reaching, inasmuch as several firms have now established studios and workshops in rural districts, while the larger provincial towns are being gradually rendered independent of the metropolis by the opening of independent works or by the erection of branch establishments by the London firms.

It is frequently a source of complaint that the Polytechnics and schools for technical instruction in this country are not altogether in touch with those for whom they are intended. So far as I have been able to gather, this is not the case with the school whose work I am now referring to, but the reflection occurs that, to secure the greatest efficiency and to gain the confidence of a wider circle of operatives, there should be associated in the control and direction of this school a number of representative process workers who would possess greater authority than the National Society of Litho Artists. There are now in London alone upwards of sixty firms and individuals engaged in the industry, and from among them it ought not to be difficult to make a satisfactory selection of governors.

In one direction there is need of and room for immediate extension. So far as the manipulation of the mechanical details of process work for letterpress printing is concerned finality would appear to have been almost reached, but there is a tendency to try to produce more artistic results by combining with the operations of the process worker the methods of the wood-engraver, and already some very fine results have been obtained. There is some controversy as to how far this is permissible, and without very careful training of the engraver for this special class of work it may readily result in degeneration. Some provision then must be made for instructing for this purpose the large and increasing number of engravers who have been pushed out of their own vocation by the encroachment of process work upon the field hitherto occupied by wood-engraving.

Undoubtedly the most widely known and the most exclusively practised of all the processes are those which are based upon photography, but there are besides a number of automatic processes which have either fallen into disuse or are only employed to a very limited extent. As time goes on, it will, no doubt, be possible to include a practical instruction in some of these as part of a general systematic course of technical tuition in process work; also it may be hoped that at no very distant date, as the result of the work of this school, we shall establish as regular industries in this country some of those beautiful processes of chromo-collotype, which have been so successfully operated on the Continent, and by the Germans in particular.

WALTER BOUTALL.

INCANDESCENT LIGHT AND SIGHT.

SOME interesting discussion has taken place of late in regard to the effect upon the eye of the Auer incandescent light, says the *Lancet*. The mantle of this incandescent system of lighting consists, as is now pretty generally known, of a network of the rare oxides (chiefly of thorium, with a small proportion of cerium), which, on being heated in the Bunsen flame, emits a brilliant white light. As might be expected, this light is comparatively rich in the ultra-violet or chemically active rays that are identical with those in sunlight, and it has been urged that this richness in actinic rays may possibly be productive of injury to the sight. This argument appears to be based on measurements of wave-lengths made by means of the spectroscope.

The arc electric light, it is said, has similar effects, but of a more pronounced character. As yet there is no evidence of experience, as far as we know—and the Welsbach light has now been in use for several years—that the slightest injury to the optic mechanism where the system has been in use for domestic lighting has ever been produced; and, unless a person deliberately stared at the naked light for some hours every day, it would be surprising to learn that real injury could be referred to this cause. It is well known that the radiation of light downward from the incandescent mantle is feeble, so that without a reflector or some reflecting surface at the top of the mantle, as in the ordinary way would be provided by a ceiling, much of the illuminating power would be lost. From the particular point of view under discussion, this is, however, an advantage for the lighting of rooms, since reflected and not directly transmitted light is pleasanter and more agreeable to the eye; besides which, in the phenomenon of reflection, partial absorption takes place, so that the light becomes pleasantly diffused and of a healthy tone.

In any case, if any apprehension should exist that the rays proceeding from an incandescing mantle are injurious because of their chemical activity—an activity which in sunlight gives life to the plant world—these rays could be readily and effectually filtered out by the simple expedient of surrounding the light with a tinted globe, such as red or orange, which need reduce but very little the originally high illuminating power. Even then the light is over 100 per cent. higher in illuminating value than the ordinary gas flame. Artificial light, of course, is most in request in the dark days of winter, and in that season, at the best of times, we receive but little more than eight hours' light from the sun, and then frequently it is largely filtered from its chemically active rays by the medium of a murky atmosphere.

On the other hand, we enjoy in the summer just twice as much sunlight, which is then of greatly increased power, and the chemical activity of which is infinitely greater than could possibly be furnished by any known form of artificial light. Taking these simple facts into consideration, we should almost expect to find in some form or other some manifestation of deterioration in the eyesight during the summer period, due to a largely increased exposure to the chemically active rays of solar light. We are not aware that any such manifestation has been observed. The argument that nature intended us to rest from the effects of light as soon as the sun is below the horizon demands, if it can be reasonably applied at all, the rejection of all artificial means of lighting, since there can be no light of any kind of any aid to the eye, whatever that can be, without some chemical activity.

Still less practicable does such a suggestion become when applied to the lands of the midnight sun and other places, or to the Arctic winter of several months' darkness. Clearly this theory could only be prompted by the consideration of the limited conditions of environment in the temperate zone. No men probably are exposed more freely and continuously to the chemically active rays of the sun than our sailors, yet their acuteness of vision and penetrative power of sight is a matter of admiration and wonder to every one. Sunlight is by a thousand circumstances widely and uniformly diffused, making it more acceptable to the eye, and during its journey to earth it undergoes an important modification, for, in passing through the air, it is deprived of some of

the red rays, while the blue rays pass on—a circumstance which explains the azure character of the sky.

In view of these facts, it is difficult to receive the theory with any seriousness that, because there may be a certain proportion of ultra-violet rays in a given artificial light, it is necessarily injurious. It would be a sorry thing if these same rays were for ever filtered out of the light of the sun by the medium of constant fog or cloud, as so often happens in the days of winter. Exposure to a purely elementary light, as red, yellow, or blue, does undoubtedly prove injurious either positively or negatively. The distress produced on working for some time, to quote one instance, in a red or yellow light, as in the dark room of the photographer, who employs one or other of these colours on account of their chemical inertness, is well known. Absence of sunlight is held to be synonymous with the absence of life, and the life-giving and invigorating qualities of solar light are largely, if not entirely, dependent upon the chemically active rays, and certain lines of scientific research have shown that, without the phenomenon of insolation going on day by day, life would be unendurable and finally extinguished. White light, therefore, as afforded in its entirety by the sun, is a necessity of existence.

ACETYLENE—PRICE AND COMMERCIAL EFFICIENCY.

[Progressive Age.]

In an interesting article by Julien Lefèvre (*Revue Scientifique*, March 6, 1897, No. 10, p. 289), read before the French Association for the Advancement of Science, considerable discredit is shown toward the statements of Willson and the works at Spray, N. C., to the effect that the price has been brought to 167·44 francs ($32·18) per tonne (2240 lbs.), counting hydraulic power at 25 francs ($4·80 per horse power per year. In Switzerland, where there is an abundance of water power, this power costs 100 francs ($19·20). As one horse power per hour produces 4 kilograms. (8·8 lbs.) of calcium carbide, the cost here becomes about 200 francs ($38·40), and the prices quoted on market are 400 francs for over 1 tonne, or 500 to 550 francs per tonne for less than a tonne. Willson claims that he can produce the carbide for 15 to 25 francs per tonne, while Pictet says that with an improved furnace he can produce absolutely pure carbide at 85 francs per tonne, though this is not as yet realised.

Theoretically, the action of water on 1 kilogram. (2·2 lbs.) of calcium carbide should produce 406 grams. or 341 litres (or 1 lb. carbide should produce ·308 lbs. or 5·5 cubic feet) of acetylene according to the equation :—

$$CaC_2 + H_2O = C_2H_2 + CaO.$$

A good commercial product should yield about 300 litres of gas (or one pound should yield 4·45 cubic feet), at a maximum selling price of carbide of 500 francs per tonne. If we then compare in the following table the price of other illuminants, we see that the price of acetylene is not so very great when all things are considered.

Comparisons of Various Illuminants.

	Price in Francs.	Consumption per Carcel hour.	Price in Francs per Carcel hour
Solids & Liquids, per Kilogram. (2·2 lbs.).			
Wax candle (de l'étoile)	2·40	80 grams.	0·1920
Colza oil	1·30	45 ,,	0·0585
Petroleum oil	0·75	30 ,,	0·0225
Illuminating Gas, per Cubic Metre.			
Butterfly and Manchester burners	0·30	137 litres.	0·0411
Benzole burners, 30 to 40 jets		105 ,,	0·0315
Wenham Star burner		100 ,,	0·0300
Parisian and Industrial burners		50 ,,	0·0150
Welsbach burner		20 ,,	0·0060
Electricity, per Kilowatt Hour.			
Arc light, round globe, average	1·10	0·011 K. W.	0·0121
Incandescent light		0·034 ,,	0·0380
Acetylene Gas, per Cubic Metre.			
Violle lamp	1·80	5·56 ,,	0·0100
Burners of small delivery		8·00 ,,	0·0144

1 gram. = 0·0022 lbs.; 1 cubic foot = 28·3 litres; 1 k. w. = 1·34 horse power; 1 cubic metre = 35·3 cubic feet; 1 franc = 19·2 cents.

PHOTOGRAPHS ON METALS, PORCELAIN, &c.

Mr. Theodor Häusermann, of Vienna, has patented a process for ornamenting objects of metal, porcelain, or the like, the objects being provided with a coating of chrome glue and exposed to the light and heated to about 300°–400° C. If some parts are to be undyed, these are protected from light by covering them.

The drawings or ornaments are produced by exposure to light of a negative or template pattern of the desired drawing.

At first the object is provided with a coating sensitive to light, for example, chrome glue, then it is exposed to the light, either the whole surface or the part which is not covered; then the parts which are not fixed are removed by washing.

The fixed, but still colourless, parts of the object may then be treated with a solution of water colour (aniline) in order to make them more visible.

This is, however, not essential, it serves only to facilitate the correction and repair of the drawing.

Finally, after the coating has been dried, it is heated to 300°–400° C., preferably by a gas heater, whereby the surface is died brown to black.

For obtaining the light sensitive composition he prefers the following proportions :—

Distilled water	100 c. c.
Fish glue or isinglass	60 to 80 grammes.
Ammonium bichromate	3·3 ,,
Chrome alum	1·3 ,,
Ammonia sp. gr. 0·914	4·7 c. c.
Alcohol	4·7 ,,

This mixture is made by dissolving successively with constant stirring:

Isinglass, with 40 c. c. of water	60 to 80 grammes.
Ammonium chromate, with 40 c. c. of water	3·3 ,,
Chrome alum, with 20 c. c. of water	1·3 ,,

And, while constantly stirring, adding by drops alcohol and ammonia.

FOREIGN NEWS AND NOTES.

Living Photographs.—We read in *Die Photographie* that the German Company, "Kinesis," formed last year for the development of this branch of photography, has not only turned its attention to the improvement of apparatus, but also to the development of fresh spheres of usefulness. A laboratory and studio have been opened, and not only many private persons have their photographs taken as moving pictures, but the scientist may use the process for the study and representation of movement in animals, plants, &c. One of the most interesting experiments has been a series of photographs of a group of flowers. Quick-growing plants were selected, and about 2000 exposures were made at intervals of forty-five seconds. This would represent a growth of about twenty-five hours. Such a series of pictures projected upon the screen would represent, in about a minute and a half, the development of a day, and the plants might be seen to grow, bloom, and fade in a very short period of time. Similar pictures might be made of infusoria, insects, fishes, processes of crystallisation, protuberances of the sun, &c. A wide field of usefulness may, therefore, be in store for the cinematograph, apart from the commonplace sphere of the advertising agent.

Reproduction of Plans, Drawings, &c.—In *Ombres et Lumière* the following process is described by A. Carteron: A well-sized paper is selected and cut rather larger than the drawing to be copied. An ink is prepared by dissolving eight to ten grammes of gum arabic in 100 parts of water, and adding thereto a few drops of aniline blue or other suitable dye. The drawing is traced upon the paper with this ink and allowed to dry. The entire surface of the paper is then covered with printers' ink, by means of a roller or stiff brush, and well equalised. After a short interval the entire sheet of paper is immersed in water, and by means of a roller, or brush, passed delicately over the surface, the ink is disengaged from the traced lines. This is facilitated by the solution of the gum. The lines are thus represented by bare white paper, and the tracing may be used as a negative. If a very opaque ground is wanted, the background of printers' ink may be intensified by brushing on bronze powder with a badger's-hair brush.

Invisibility of Röntgen Rays.—In the *Photographisches Archiv* it is remarked that Cowl and Levy-Dorn have made a communication on this subject to the Berlin Physiological Association. Röntgen had stated that the rays were invisible, and this was called in question by Brandes and Dorn, who affirmed that the X rays excited distinct sensations of light. On approaching a Röntgen tube they saw a circle of light, which was more intense and broader on one side. Brandes and Dorn's observations have been accepted as correct. Cowl and Levy-Dorn have instituted a number of experiments, from which possible causes of error were excluded with great care, and neither they, nor a number of other observers, have experienced the sensations described by Brandes and Dorn. In the great majority of cases there was no distinct sensation of light, and, in the few where it was observed, sources of error were not excluded.

Even then there was no circle of light, only a general luminosity without distinct form. Röntgen's opinion is, therefore, confirmed, and the negative results are strengthened by the fact that more powerful rays were used. The appearances observed by Brandes and Dorn are probably of subjective nature, and explicable after the manner of the luminous sensations obtained when the eyes are closed in a dark room.

Orthochromatic Plates.—The preparation of colour-sensitive plates by dipping forms the title of an article by Dr. E. Vogel in the *Photographische Mitteilhungen*, and has special reference to their keeping quality in summer. The life of a plate dipped in a solution of erythrosine is shorter in summer than in winter. In winter it may keep good for weeks, but in summer frequently not more than a few days. The addition of nitrate of silver to the bath increases the difficulty. The life of the plate increases as the amount of ammonia in the bath diminishes, and, though the sensitiveness may be less, plates prepared with less ammonia develop cleaner, and will stand more forcing. Dr. E. Vogel recommends for summer use:—

Erythrosine solution (1 : 1000)	50 c. c.
Distilled water	150 „
Ammonia	1 „

or for the erythrosine-silver bath—

Erythrosine solution (1 : 1000)	50 c. c.
Distilled water	100 „
Solution of nitrate of silver (1 : 1000)	50 „
Ammonia	2 „

to be diluted by addition of half as much more water. In very hot weather cool the bath with ice. The plates keep best when packed film to film.

Albumenised Paper.—There are signs on the Continent, as well as here, of a return to albumen. P. Hanneke draws attention in the *Photographische Mitteilhungen* to the fact that it has not been superseded by gelatine or collodion, for publication prints, and again recommends it to the amateur. As special recommendations, he points out that albumenised paper does not curl in toning, fixing, or washing, and is consequently less liable to tear. Albumenised prints are also easier to mount, but its chief recommendation is the wide range of beautiful tones it possesses. The combined bath has special attractions for the amateur, and attention is drawn to the following formula for albumenised prints as giving very fine tones and stable results:—

Distilled water	400 grammes.
Hyposulphite of soda	100 „
Acetate of soda	8 „
Nitrate of lead (previously dissolved in 100 c. c. of water)	8 „
Chloride of ammonium	25 „
Citrate of potash	20 „
Citric acid	5 „
One per cent. solution of chloride of gold	25 c. c.

The bath is allowed to settle for twenty-four hours before use and the prints are not washed before toning. The bath may be used repeatedly.

Burnt-in Photographs on Glass.—The *Photographisches Archiv* draws attention to the specimens shown at the Paris Academy by L. Lémal. Experiments were at first made to produce colours upon glass, by allowing the metals or oxides to penetrate the glass by means analogous to the cementation process. If a piece of glass is brushed over with a silver salt, and then heated to 500° or 550°, it is yellow by transmitted light, and the silver salt has penetrated the glass. By reflected light the glass is not yellow, but exhibits a yellowish-green to bluish-violet fluorescence. By such means Lémal has caused the silver of a photograph on glass to be absorbed by the glass. If red glass stained with cuprous oxide is used as a support, the photograph is invisible by transmitted light, as the yellow is lost in the deep red, but by reflected light the bluish image appears in strong relief.

Collotype Plates.—A. Albert gives the following remedy in the *Photographische Correspondenz* for prevention of loss of half-tone. Trouble often occurs in damp weather, especially if the workroom is rather damp. Plates soon lose their printing quality under such conditions and the whites are very liable to injury. If the plate is slowly warmed to 50° R., and, after cooling, at once immersed in the etching fluid, the difficulty will be greatly reduced if not entirely avoided. The film is completely dried in this way, which is not the case under the unfavourable conditions referred to. The gelatine consequently has less resisting capacity. At the same time a larger addition of chrome alum to the bichromated gelatine will be found very advantageous.

Lithographic Ink.—In the same journal the following receipt is given for Lemercier's ink:—

Yellow wax	4 parts.
Mutton fat	4 „
Marseilles soap	12 „
Shellac	6 „
Lamp-black	1 „

to be well mixed warm. Rub down in a little distilled water for use.

Backing Sheets.—A writer in the *Deutsche Photographen Zeitung* states that he has found that good anti-halation backing sheets can be made by coating stout paper with a solution of ten parts of gelatine in seventy-five parts of water, and adding sixty parts of glycerine, and then dissolving in the mixture sufficient red dye such as aniline red to give it a good deep colour. Such sheets are always sticky and merely require squeegeeing into contact with the back of the plate, and they can be readily stripped off before development. If they get dry and hard from constant use, rubbing them over with glycerine will render them fit for use again.

Our Editorial Table.

Convention Photographs.

By W. F. Hindley.

A Convention Meeting usually affords Mr. Hindley an opportunity of exercising his undoubted skill in hand-camera work. He has shown us a number of capital results obtained at some of the excursions of the Yarmouth meeting. They are chiefly figure studies of prominent Conventioners, and they testify to Mr. Hindley's alertness in securing characteristic attitudes and expressions. Moreover, the humour of the photographs is of a kindly nature, and thus all concerned can readily enjoy them. Technically, too, the results are all that could be desired.

"The Dukeries" is the title of a small illustrated pamphlet descriptive of that favoured region of the Midland counties, in which Clumber, Worksop, Sherwood, and other beautiful places are situated. The new line of the Lancashire, Derbyshire, and East Coast Railway Company runs through the district, and the pamphlet emanates from the Company's chief office at Chesterfield. The line will, doubtless, be popular among tourists.

The Autocopyist Company, of 72, London Wall, E.C., have sent us some specimens of prints produced by the photo-autocopyist. The prints are in collotype, and are of very good quality. Imitation silver prints and rough-surface effects are among the specimens, which amply attest the value of the special modification of the collotype process here employed.

Views in St. Paul's Cathedral.

Photographed and published by Freeman Dovaston, 5, George-street, Euston-road, N.W.

The twenty-five views of St. Paul's Cathedral included in this little book are extremely good half-tone reproductions of the author's negatives, than which nothing better could be desired. Mr. Dovaston has indeed done his work well, the views being carefully chosen and capitally photographed. Some brief descriptive notes by Dr. Sparrow Simpson enhance the value of the book, which is published at one shilling.

VIEWS OF ST. SAVIOUR'S CHURCH, SOUTHWARK. PRICE 1*s.*

Photographed and published by Freeman Dovaston, 5, George-street, Euston-road, N.W.

On the south side of London Bridge stands the comparatively little known but fine Gothic church of St. Saviour, Southwark, said, indeed, to be only inferior to Westminster Abbey for architectural beauty. In the little book before us, Mr. Dovaston gives fifteen views of the principal parts of the church, the Rector, Canon Thompson, supplying the notes. Not only for the capital quality of the photographs, but also for the interest attaching to this very fine church, Mr. Dovaston's book will, doubtless, be welcome to many lovers of the mediæval. We congratulate Mr. Dovaston on his various productions.

News and Notes.

ERRATA.—Page 493, line 37, *for* the word "wrote" *read* "written."

GLASGOW INTERNATIONAL PHOTOGRAPHIC EXHIBITION, 1897.—The Hon. Secretary of this Exhibition (Mr. William Goodwin, of 3, Lynedoch-street, Glasgow, writes: "Will you kindly remind intending exhibitors that the latest date for receiving exhibits is Saturday, August 21? Entries will be received up to August 14."

PATRICK N. CONROY, described as a seaman, was charged at the Guildhall (London) Police Court, on July 30, with having obtained charitable contributions by fraud. It appeared that the accused called at the offices of several photographic publications, and, representing that he had just obtained a situation with a firm of well-known Irish photographers, but had not the necessary funds to travel there, obtained several small amounts. However, the trade had been previously warned of a man answering the description, and, on his applying at the office of the Photographers Benevolent Association, he was given into custody. Prisoner was eventually sent to gaol for two months with hard labour.

PHOSPHORESCENCE OF OZONE.—M. Marius Otto has just discovered an experimental fact, says *La Nature*, that was described recently in his name before the Academy of Science by M. Friedel, and that may be productive of important results. This fact relates to the phenomena of luminescence to which ozone gives rise in special conditions. The fact was observed for the first time during the aspiration of ozonised air by means of a water aspirator. The light took its rise at the point of contact of the water and the ozone, and the water remained luminous for five or six seconds after issuing from the aspirator, so that a flask filled with this luminous water, and taken into a dark room, could be followed distinctly. The experiments were made with ozonised oxygen, containing forty to fifty milligrammes of ozone to the litre (about half grain to the quart), and made with ozonisers invented by the author. It seems that the luminosity thus produced by the contact of ozone and water is due to the presence, in the latter, of organic matter of animal or vegetable origin, and that most organic substances are able to produce, with ozone, phenomena of phosphorescence. This is, then, a very particular and very interesting case of low-temperature combustion, and a new example of the production of cold light.

X RAYS AND FEMALE BEAUTY.—What effect will X rays have in the future on the standard of female beauty which at present prevails? This is practically the question asked by M. Gaston Moch in an erudite and elaborate paper in the *Revue Scientifique*. He supposes a man specially gifted with the faculty of seeing countless vibrations of rays of light, and calls him a xylope. Such a person could have an existence as well as cave animals, who see through the deepest darkness. Indeed, M. Moch seems to think that the development of the X-ray system will lead to the discovery of many beings gifted with this peculiarly piercing sight. To such persons the scientist says, lovely women will appear as skeletons covered with a gelatinous sort of matter. For them the test and standard of female loveliness will not be expressive eyes, rosebud mouths, dimpled chins, and other attractions that go hand in hand with these, but the rigid anatomy, the bony frame of the female form. Novelists of the future, according to M. Moch, would always, in the event of this sort of test prevailing, have to change their descriptions of heroines intended to attract lovers. Ernestine, for instance, would have to be portrayed by the fictionist as possessing a pectoral frame of faultless symmetry, crowned by equally impeccable shoulder blades set off by a graceful breast bone and elbow joints neatly rounded amid the semi-transparence of the flesh. It is needless to say that M. Moch, in his humorous theory as to the development of the X-ray power, expresses pity for the persons whom he calls xylopes.

SEQUEL TO AN INFRINGEMENT OF COPYRIGHT CASE.—At the Manchester County Court, before his Honour Judge Parry, on the 27th instant, the case of E. Hulton & Co. (newpaper proprietors) *v.* George Cliffe Melville, who carried on business in Market-street, Manchester, was mentioned. Mr. Corbett, who appeared for plaintiffs, said the defendant brought an action against them to recover damages for an alleged infringement of his rights in a photograph of F. E. Bacon, the well-known runner, which Messrs. Hulton reproduced. Judgment was given against Melville, and the matter now came up in the form of a judgment summons for the payment of costs recoverable against him. Defendant was an auctioneer, and also a certified County Court bailiff, and every article that could be seized for the payment of his debts he had vested in trustees for the benefit of persons other than himself, and, having brought the action and lost it, he had not paid a shilling towards the costs. He therefore suggested that an order should be made on the defendant for payment of the costs by instalments of 1*l.* per week. The defendant said he won an action which he brought against a London paper for infringement of his rights in a case precisely similar to the one he lost against Messrs Hulton. Mr. Corbett contended that the cases were not similar. The defendant, on being questioned as to his means, said he was being kept by his wife and family. His Honour made an order for the payment of the debt by instalments of 3*l.* per month. In view of the statements he made when appointed bailiff, and his statements in court regarding his means, he thought it advisable to suspend the defendant's bailiff's certificate for a time. Defendant said he would be willing to give up the certificate altogether, as he had not levied a single distress under it.

Patent News.

THE following applications for Patents were made between July 21 and July 28, 1897:—

SQUEEGEES.—No. 17,060. "Improvements in Photographic and other Rollers or Squeegees." H. W. COTTRELL.

COLOURED PHOTOGRAPHS.—No. 17,122. "An Improvement or Improvements in the Production of Coloured Photographs." G. J. SERSHALL and J. H. KIRK.

CAMERAS.—No. 17,299. "Improvements in Photographic Cameras." Complete specification. H. WOOD and S. CLARK.

LANTERNS.—No. 17,438. "Improvements in or relating to Optical Lanterns." A. SWEETSER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
7	Hackney	Excursion: Caterham. Leader, J. O. Grant.
9	Bradford Photo. Society	Open Discussion: *Trimming and Mounting.* Leader, P. E. Newstead.
9	North Middlesex	Technical Evening.
10	Birmingham Photo. Society	Exhibition of Representative Work by the Leading Photographers of the Country.
10	Hackney	Discussion: *Hand Cameras: Magazine v. Dark Backs.*
11	Photographic Club	Open Night.
12	Bradford Camera Club	Lecture by a Member of the Leeds Camera Club.
13–22	South London	A Week's Tour in the North of Ireland. Leader, H. Esler.
14	Birmingham Photo. Society	Excursion: Coventry. Leaders, A. B. Clarke and E. O. Middleton.
14	Darwen	Excursion: Bull Hill and District. Leader, J. W. Smith.
14	Oldham	Excursion: Kenyon Peel Hall and Worsley. Leader, T. Heywood.
14	Wolverhampton	Excursion: Penkridge. Leader, G. Hanmer.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 29,—Mr. A. L. Henderson in the chair.

The meeting resolved itself into one of a conversational character, dealing with the subject of toning, and toning baths in particular. The discussion turned upon the following queries from the question-box, namely, as to whether, and if not, why not, the sulphocyanide of ammonia and gold bath fixed pictures; and as to the cause of the sudden breakdown of a sulphocyanide bath, so that no addition could make it tone. The work of the combined bath as compared with the ordinary methods of toning and fixing was also touched upon.

Mr. A. HADDON considered that there must be a certain amount of fixation in the sulphocyanide and gold bath, judging by the change of colour in the print before toning begins, and entered into the chemical aspect of the case to support this view.

The CHAIRMAN'S opinion of the combined toning and fixing bath was that, if it was properly used, it should be the most permanent method.

Mr. E. J. WALL, in a lengthy experience with prints so toned, found a great number of them go, some in a couple of months.

Mr. A. MACKIE was in the habit of adding a small quantity of salt to the first washing water, and also to the toning bath itself. One of the advantages of this course was that, the colour of the print being altered from its original purplish tint to a very distinct red, the exact degree of change of colour due to the toning could be seen.

The CHAIRMAN took this as a point in favour of the combined bath, one being certain of the colour of the print, as there were no subsequent processes involving any alteration to the colour of the image. In reply to a query as to fixing before toning, he thought, both theoretically and practically, it would be the better of the two, greater uniformity of result being expected in his opinion. He gave an account of the effect of certain well-water which he was compelled to use in his photographic work, and which, from some peculiar constituent, was of a very decomposing nature. In his emulsion experiments, he found it necessary to provide himself with large quantities of distilled water on this account.

Mr. WALL said the question of water was one of some importance. He thought a fruitful cause of some of the difficulties found in toning lay in the fact that there was a very general habit of mixing the gold and the sulpho-

cyanide in too concentrated solutions. It was not sufficient to dilute one first and then add the other, but each should be diluted as much as the bulk of the solution would admit, and added in that form.

Mr. Haddon's procedure was different. He subjected the mixed concentrated solutions to heat until the precipitate formed went into solution. By this means he fancied he got less double toning than previously was the case. As suggested by Mr. Wall, this was simply another way of getting the colourless bath, which was so necessary.

Mr. Kellow showed a piece of film on which were a couple of strangely shaped figures. They were similar to others he had met with, and the film showed no signs of an image, when developed, fogging all over and producing the marks shown.

Mr. WALL said that possibly an explanation given some time before in another instance of a similar character might apply equally in this. It was suggested at the time that there was a pinhole somewhere in the camera, and that it traced upon the sensitive film a line following the movements of the camera.

Mr. E. BANKS made an interesting communication upon the subject of development with bromide of copper, the use of which, in that direction, he had not heard of before. He described how he was led to make the trial from a discussion upon intensifying with copper at a previous meeting. He found that it developed the image with greater energy than did a pyro developer, with a full range and with less exposure. There was a peculiarity about the method in that, if left long enough, the image would vanish altogether. He went into the details of the preparation of the sub-bromide of copper, which was that used, but, at the request of the meeting, promised to give an account of his experiments in *A Chat on some little-known Developers*, which will take place at an early date.

It was also announced that papers had been promised for the current session by Mr. Haddon and Mr. Wall, and that Mr. Henderson had offered to provide for two lantern evenings.

FORTHCOMING EXHIBITIONS.

1897.

August 31 ..... Royal Cornwall Polytechnic Society, Falmouth. Edward Kitto, F.R.Met.S., The Observatory, Falmouth.

Sept. 1–Oct. 13 ..... Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.

„ 27–Nov. 13 ..... Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.

December 9–11 ..... Aintree Photographic Society.

There will be Open Classes at the above.

ELECTRIC LIGHT AND SAILORS' EYESIGHT.—Owing to the intensity of the electric light used on board of men-of-war, men are frequently affected with eye complaints, which in some cases have led to total blindness. It has been observed that eyes in which the iris is not heavily charged with pigments—that is to say, grey and blue eyes—are more likely to be injuriously affected than brown eyes. These eye troubles are ascribed to two causes, viz., the intensity of the light and the action of the ultra-violet rays. Oculists recommend the interposition between the eye and any powerful light of a transparent substance which will intercept the ultra-violet rays, such as, for instance, uranium glass, which is yellow. The French naval authorities supply dark blue glasses for the use of those men who have to do with search lights, &c., and the cases in which injury has been caused to the eyes were those of men who had neglected to use these spectacles, which, however, do not appear to afford any protection against the ultra-violet rays.—*Revue du Cercle Militaire.*

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CORRECTION OF DISTORTION.

To the EDITORS.

GENTLEMEN,—I read with interest the leading article in your last number, for there have I first seen any distinct allusion to the "dwarfing" effect produced in copying where correction of distortion is attempted by inclining the faulty subject instead of placing it upright and correcting by inclination of the sensitive plate. This dwarfing effect I have myself twice pointed out, first on March 21, 1884, and again more fully on April 8, 1892, in an article entitled, *On Corrections of Distortions, &c.*, both articles printed in the *Photographic News* of those dates. Professor Allen's paper and the discussion upon it I regret that I have never seen. Neither, I am sorry to say, did I see your article of two years ago. I do not know whether my own paper has been referred to elsewhere—it would seem not—but I think it certain that you could not have seen it, as it contains an analysis explaining the seemingly anomalous result of the experiment you recorded. It follows, from analysis of the different modes in which inclination of the sensitive plate acts in producing vertical and horizontal distortion respectively, that it is really necessary to use a lens of *precisely* suitable focal length in order simultaneously and accurately to correct both distortions, for, while vertical distortion directly follows the inclination, its value being strictly as the cosine of the angle of this inclination, the horizontal distortion is a *product* of vertical inclination and horizontal angle combined, and this horizontal angle varies with the distance at which the lens is placed, that again depending on the actual conjugate focal length of the lens as used. That of the lens you employed is not, however, stated in your article, although varying focal length seems correctly to be suggested as a factor in the problem. Thus, if the *same lens* first used to get a distorted but *reduced* image of the chessboard were afterwards employed to correct the distorted copy in recopying to the *same size*, its conjugate focal length could not have been the same in both cases, so that the conditions of equal focal distance shown to be necessary simultaneously and accurately to correct both errors could not be fulfilled, my theory thus quite accounting for the unsatisfactory result.

In my paper, published April 8, 1892 (*Photo News*, p. 228), after saying that, for correction of shortening (dwarfing), the inclination of the sensitive plate must be exactly equal to that of the original distorted plate—this error being purely a matter of *angle of inclination*, and quite independent of lens or its focal distance—I proceeded to point out that the correction of "convergence" (horizontal distortion) *does* vary with those conditions. To quote—

"It proceeds from want of symmetry in the *ratios* of distance between different parts of the object and their corresponding parts in the image, and these ratios vary with every variation of the angle embraced. The shorter the focus of the copying lens, the nearer must it be placed to the object; therefore the larger becomes that angle, and the more effective the correction produced by a given obliquity of the lens to the plate. And this obliquity should be attained by so adjusting the *swing back*, as that the top of some tower to which the lines in the original negative converged may now be brought farthest from the lens, and so caused to diverge again. To find the proper lens, we note that the angle of inclination must be equal to that of the original tilting in order to correct the shortening. Therefore the distance from lens to plate must, in copying to same size, be equal to the original distance, so that the required focus of lens is exactly half the focal length of the original one, that the double length for conjugate focus may bring it to equality. For enlarging or reducing, the same principle applies. To ensure a perfect correction the conjugate focus used should bear the same proportion to the dimensions of the plate as the original focus did in the original negative. If such a rectilinear lens be not available, a pinhole might suffice. But, though a very small stop is always proper, a rectilinear lens is preferable, as near as may be to the required focal length. This completes the correction when the original negative has been taken with a rectilinear lens, or with a pinhole."

The case of a distorting lens was next examined, showing that, though ordinary distortions from tilting may be perfectly corrected at one operation, yet, when distortion by the lens is added, its correcting conditions are so altered that all three errors cannot be perfectly corrected at once.

To apply all this, we can often, unfortunately, only guess at the original focal length used, or arrive at it by tentative correction. But it is important to know that corrective operations are pretty sure to require a lens of *much shorter focus* than the original one, greater proximity to the subject lengthening the conjugate focus. For, when a lens of too long focus is used, a larger correcting angle of inclination becomes necessary, which over-corrects the vertical error, as in the experiment recorded. Had a much shorter focus lens been used for *correcting* the distorted image of the chessboard than was employed in *producing* that distortion, both conjugate foci might have been brought to a similar length, and then not only would the final result have been at once fully correct, but the operation, requiring no greater inclination of the reversed swing back than the original inclination without it, which produced the distortion, would probably have been convenient as well as effective.

I shall certainly feel surprised should no one acknowledge my prior investigation, as to what was actually published under my name on April 8, 1892: *Litera scripta manet.*—I am, yours, &c.,

106, *High-street, Oxford.* W. H. WHEELER.

THE X RAYS AND THE FRENCH CUSTOMS.

To the EDITORS.

GENTLEMEN,—You will be surprised, and not less pleased, to hear that the X rays are being applied here in a quite unexpected quarter; they are made use of by the Custom-house authorities at the station of Lyons-Bercy for examining parcels-post packages, and this with such extraordinary good results that, where formerly there was great delay in opening the packages, great havoc done to the packing, great difficulty at times in correctly ascertaining the contents, now 1000 packages are ready for delivery or forwarding in an incredibly short time, no article whatever apparently escaping the perspicacity of the rays, to the great delight of the officers when some unexpected article makes its appearance. Thus there were to be seen, in rapid succession, oranges, grapes, a clarionet, a pair of boots with spurs, a bridle and bit, a lock, a piece of velvet, bottles without end, &c., and finally, in a package hermetically closed, a needle; and, as some surprise was expressed at this solitary needle, the Inspector gave as a reason that in some feminine attires a needle had been forgotten. He says that the X rays have traversed the linen and reached the needle. The Inspector was right, for, on opening the package, there were found ladies' clothing and a threaded needle.—I am, yours, &c.,

GEORGE FERNAU.

Lyons, July 28, 1897.

CASH WITH ORDER.

To the EDITORS.

GENTLEMEN,—I should like to know if other people have the same experience as I have in procuring goods from London houses that demand "cash with order." You send the cash, and in an ordinary way you hear nothing for a week; sometimes a post card to say your order is "having attention." Living in the country, one is dependent a good deal on parcels post for paper, plates, and chemicals, and it is most annoying when money has been sent to be kept waiting days and days for the articles. I lately sent cash for a hand camera. On its arrival, in about ten days after sending cash, I found it to be practically useless, and asked to have it exchanged for other goods, and so far have not been vouchsafed a reply.

I think, if any other of your readers who may have been served the same would send in confidence the name of the firms to you, to be published if necessary, this evil would be checked, as there are other firms who are notable exceptions to this style of business, and who should be patronised in preference to those firms whose only object seems to be to get money out of one, and whether you are satisfied or not matters not one little bit to them. I quite believe "cash with order" is necessary in many cases, but, if this is demanded, let the sellers do their part, and, when they get the cash, supply the articles in due course.—I am, yours, &c.,

CAVEAT EMPTOR.

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—Will you allow me to announce through the valuable medium of your columns that the fifth Exhibition of the Photographic Salon will open on October 4 at the Dudley Gallery.

Prospectuses and entry forms will shortly be sent out.

Our receiving agents are Messrs. Dicksee & Co., 7, Ryder-street, and the *receiving day Saturday, September* 18, on or before which day all pictures intended for exhibition should reach Messrs. Dicksee's warehouse.—I am, yours, &c.,

ALFRED MASKELL.

Ilfracombe, August 1, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Miss L. G. Graeme, Mortimer Cottage, Mortimer, Berks.—*Photograph of relic Inchbrakie's witches' ring and charm.*

J. M.—Of Marion & Co., Soho-square, we believe.

B. B. C. Apply to the Photochrome Company, Cheapside, E.C.

INQUIRER.—The work is not obtainable in this country, except through a foreign bookseller.

COPYRIGHT.—1. No; you received what was recently defined as "valuable consideration" for the photographs, and therefore the copyright is not yours. 2. Not in the circumstances mentioned in your first question.

FURNACE FOR CERAMIC WORK.—T. BLAKE. The best and most convenient muffle furnace you can get for firing small enamel pictures would be one or other of the gas furnaces supplied by Messrs. Fletcher & Co., of Warrington.

LENS.—C. A. COX. A cabinet lens of six inches back focus is not well adapted for taking groups on half-plates. It, if a good instrument, may be used for the purpose, but it will require to be considerably stopped down.

COLLODION EMULSION.—X. Y. Z. Formulæ for collodion emulsions, and developers for them, are given on pp. 973–976 of the ALMANAC. They will possibly require a slight modification if used for ferrotypes. This you can work out for yourself by a few tentative experiments.

ANGLE OF VIEW.—BEGINNER. The reason why your friend obtained more subject in his negative than you did in yours, though both plates were of the same size, is that he used a shorter-focus lens than you did. Had both lenses been of the same focal length, the same amount of subject would have been included by each. The cameras had nothing to do with the case.

COLLODIO-CHLORIDE.—M. MALLONY. The only way we can account for the tint on the prints is that the free silver in the prints was not quickly washed out of the paper when they were first put into the water prior to toning. If the prints are allowed to soak long in the first washing water, with most papers they will acquire a similar tint when toned. Wash the free silver out quickly.

PATENTS.—HUNTS writes: "The other day, when I visited the Photographic Section of the Exhibition at the Crystal Palace, I noticed several of the things that have formed the subject of some recent patents. Can I work any of these things without getting myself into trouble?"—Yes; you can make, or use, anything that was made, or used, before a patent was taken out for it. Any patent would be invalidated if the invention was in use before it was taken.

AMMONIA FUMES.—T. CONROY. We have heard of some persons experiencing unpleasant effects from the fumes of ammonia when using the pyro-ammonia developer, though we have not done so ourselves; but we may mention that our dark room is not so small as many, and it is also tolerably well ventilated. This is a matter too often overlooked in arranging a dark room. Get yours better ventilated, or we should advise you to adopt some other developer, in which ammonia is not a constituent, for health must be considered.

PIRACY IN AMERICA.—HONESTY writes: "I find that one of my copyright photographs—indeed, two that I know of—have appeared in one of the American illustrated journals without any permission from me, or any acknowledgment whatever. Have I any remedy against the publishers?"—No, none whatever, as America is not one of the signatories to the International Convention. Had the pictures been pirated in Germany, France, or in the countries of the other signatories, you would have had. However, you can take action against any one selling the journal here, if that is worth while.

YELLOW TONES.—INQUIRER writes: "I enclose print for your opinion. Can you tell me the cause of this yellowness in half-tones, especially noticeable round the vignettes? The paper is treated with every care. I have used it for over a year now, and have had no trouble until the last two or three reams."—We should say by the appearance of the print that it is due to the manipulations, but we cannot, of course, say where, as we have not seen them carried through. Possibly the recent hot weather, without due precautions, may be connected with the trouble. Are you using the same kind of hyposulphite of soda as formerly?

PHOTOGRAPHING INTERIOR.—PYRO asks: "Will you kindly inform me in the next issue of THE BRITISH JOURNAL OF PHOTOGRAPHY of the following? I have some interiors to take, of which I have not had much practice, they being dining-rooms, with tables laid; fairly well-lighted rooms. Would slow plates be the best? I am using an extra rapid for my ordinary work. What kind of black paper? and how is it attached to plates as a preventive of halation, as mentioned in JOURNAL of July 16, p. 451? The rooms are long and narrow, with windows at one end. Would you advise the picture to be taken from the window end or the opposite end?"—In such a case as this, we should advise the plates to be backed with the backing, a formula for which is given on p. 980 of the ALMANAC, in preference to any paper backing.

RESIDUES.—T. A. W. writes as follows: "I have often read that a large amount may be saved by keeping the washings of prints, and throwing the silver down as chloride, and by burning the spoilt prints and sending the residues to the refiner. This, of course, is a great consideration to an amateur. I have no convenience for saving washings and fixing; but I saved a considerable quantity of spoilt prints—gelatino-chloride and collodio-chloride—burnt them, and sent them to ——'s. The weight of the lot was nearly two pounds, and all that was returned to me, after all the trouble, was 1*s.* 7*d.* Is that worth the trouble?"—We should say not, also that we are rather surprised that the sum received was so much. These papers contain but little silver, and the major part of it goes into the washing waters and in the fixing. Most of the weight of the ash was made up of sulphite of the baryta with which the papers are surfaced.

INTENSIFICATION.—AJAX says: "I send you a negative—please note the white patch at the upper edge. The negative was intensified with mercury and ammonia; after bleaching by the mercury, it was washed for half an hour under the tap. The white patch represents the point of impact of the stream of water on the plate. I have several times noticed the same thing, and now I usually take care that the plate is not immediately under the stream of water. But what is the cause of the white patch? Why should that part of the plate not have blackened in the ammonia? Can the stream of water have washed out of the film the chloride of silver from that spot?"—It is unadvisable to leave a plate exposed to the impact of a *jet* of water for any great time, particularly in hot weather. It seems to us that the water has been warm enough, by long impact, to partially dissolve a portion of the gelatine film itself at that point, hence the thin spot.

STUDIO BUILDING.—INQUIRER writes: "My JOURNAL has unfortunately been detained this last two weeks, and I have just seen your reply to my query *re* lease. Your understanding of my question is quite correct, though, of course, I mean by promise something more than a mere verbal agreement. My position is this: I may want to open a studio, but could not afford to both build and furnish it as I would like. Would a landowner build the studio if a lease were taken and signed for a number of years, and at such a rent as would make his investment remunerative? If not, what is the usual procedure, as I think most photographers rent their studios, very few, indeed, owning them, even when they have been built for themselves and to their own plans. Thanking you for so kindly replying."—The custom is, generally, for the tenant to take the premises on lease, and then build and furnish the studio according to his ideas, after, of course, securing the landlord's permission to build it. Possibly, however, a landlord may be found that will build a studio for a tenant upon terms; but that is not the usual way that studios are erected nowadays. They are generally built by the tenant, or those already erected rented.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1945. Vol. XLIV.—AUGUST 13, 1897.

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EX CATHEDRÂ.

HE unflagging manner in which Mr. H. Harvey George, the Local Hon. Secretary of the 1897 Convention, performed the duties f his arduous office was observed and appreciated by all those who attended the meeting at Yarmouth last month. It is not oo much to say that the great success which attended the athering was largely due to the incessant hard work and attention which Mr. Harvey George freely bestowed on behalf of he Convention. A feeling has been simultaneously expressed n many quarters that it would be a graceful act to accord Ir. Harvey George some special recognition of his efforts, and e have much pleasure in announcing that it has been decided o present him with an album of photographs taken by members during the Convention meeting. A small Committee has een formed for carrying out the scheme, and the new Hon. ecretary (Mr. F. A. Bridge, of East Lodge, Dalston-lane, ondon) has undertaken to receive photographic contributions ntended for insertion in the album. We ask all those of our eaders who attended the Convention to send Mr. Bridge a election of their photographs, so that the album may be made omplete and representative, and worthy of the acceptance of Mr. Harvey George, to whom we trust it will long remain a pleasing souvenir of a memorable time.

* * *

We have noted with pleasure that a branch of photography which for some years we have endeavoured to foster, viz., stereoscopic work, appears to be growing in popularity, not perhaps so much as could be wished amongst amateurs, but decidedly so with professional photographers. The recent Jubilee festivities offered excellent opportunities for the taking of binocular records of the numerous scenes and incidents of the celebration, and some very good realistic results were secured. Before us, as we write, are several stereoscopic transparencies of the principal parts of the Queen's procession, and also some of the chief thoroughfares of London as they appeared on June 23. These are the work of Messrs. Lévy & ses Fils, of Paris (the successors of Messrs. Ferrier & Soulier), and they are of exceedingly good quality. Besides Messrs. Lévy many other firms who make a speciality of stereoscopic photography, were at work on Jubilee Day, and we trust that the widespread dissemination of their results will not only help to still further emphasise the public taste for binocular photographs, but will encourage photographers to take up their production.

* * *

While on this subject we append a letter from Mr. E. C. Murray, of 37, Buxton-road, Walthamstow, who offers a suggestion in regard to the production of stereoscopic effects. Mr. Murray says: "May I suggest to your readers, who are in a position to try the experiment, to see if it would be possible or practical to make a camera for this purpose, by so adjusting two lenses (aided possibly by two prisms similar to those used in stereoscopes) so that the image from each lens would mingle to form one picture on the plate? If so, we could, I think, not only catch the stereoscopic effect, but would be able to use plates fifty per cent. slower, and still get about the same exposure."

* * *

The suggested experiment could only result abortively, for the superposition of two images would not yield a stereoscopic effect, in virtue of the fact that, in order to obtain the phenomenon of stereoscopicity, two dissimilar photographs, mounted side by side, are required before the right and left eyes can perform their offices of transmitting dissimilar images to the brain, which is in reality the coalescing agency that

imparts the effect of relief and solidity to the picture. The plan suggested by our correspondent was vainly patented in 1887 with the idea that stereoscopic effects could be imparted to single portraits. It has also been practically tried and found wanting; indeed, a few years ago, some photographs produced in this way were shown to us, the stereoscopicity of which we had little difficulty in demonstrating to be illusory, much to the disappointment of the "inventor" of the system.

* * *

THE Dansac-Chassagne process of colouring photographs has not long been allowed to escape rivalry. We are informed that a late member of M. Chassagne's staff in Paris has perfected what has been described to us as a simpler and better process of producing photographs in colours than that of Messrs. Dansac and Chassagne. By request we have sent a silver print to Paris to be coloured by the new process, and, upon receipt of the result, we will apprise our readers of our opinion thereupon. Incidentally, we learned that in Paris the Dansac-Chassagne coloured photographs are produced in large numbers by a considerable staff of *employés*. It is worth noting as curious that, while Radiotint—that is the name of the process—is having the benefit of energetic exploitation in Paris and New York, nothing is heard of it commercially in London. In both the cities named, as well as in most other parts of the world where interest is taken in colour photography, we have been gratified to find the many searching comments we have felt it our duty to make in reference to the matter since last February have been very attentively received.

* * *

ON the subject of pictorial poaching almost a volume could be written, but our main concern for the present is with a recent letter we have received from a professional photographer. At the same time we may say that the minds of many of our amateur friends have been much exercised as to a code of ethics which should govern the extent of their proprietorship in what may be called the leading idea of certain of their photographs exhibited or published.

* * *

IT is admittedly bad form to produce a subject photograph bearing a real resemblance in treatment and composition to one that has already been before the public; it is difficult to put the matter more definitely. It is, however, still more difficult to speak *ex cathedrâ* as to the extent to which one who has discovered a lovely piece of rural scenery may claim a personal interest in it. The picture once published or exhibited, it would, we think, be selfish to say a second man was intruding if he ventured to secure a negative of the same place, though we are ready to admit that, when a particular spot has been passed over by a score of photographers, one only of which has seen how, by the introduction from external sources of some addition to foreground or middle distance, the hitherto neglected view has been converted into a picture, it is rather hard on that one to have his ideas of a picture exploited by others. Where the thing is possible, it is best to do as a well-known exhibitor did. Some years ago he discovered a lovely spot—lovely under certain conditions—exhibited, received medals, and kept the whereabouts of the *locale* a profound secret.

To pass on to the other aspect of the case, we may refer t the letter of a correspondent who complains of outside photo graphers coming into his district, circularising the schools and offering to take groups of schoolboys or girls in th nighbourhood. "He pays no rates or taxes in my neighbour hood, subscribes to no charities, and has no right here at all, and he wishes our help in denouncing such a course. We ar afraid we cannot offer any comfort whatever to our corre spondent in this matter. The present is an age of develop ment and competition, and photography, being worked as it i in ninety-nine cases out of a hundred on strictly commercia principles, is bound to follow the path of other businesses Suppose we were to say we highly disapprove of this sort o poaching, what possible advantage would there be to ou correspondent? None; and such an opinion—our own o others'—has nothing to do with the matter, the outsider would come in just the same. Competition is so keen tha methods are resorted to of which our correspondent seems no have any knowledge. There is scarcely a man in the country connected with any body or society which, even in the remotes degree, might be termed public, but has received a circula asking him to sit, without charge being made, for his portrait towards forming a series of portraits of such-and-such a body to which he belongs. These circulars are issued broadcast ove the country to mayors, justices, M.P.'s, fellows of learned societies, &c., and always this wonderful "series" is to com off. We rarely see these series published; it would not pay but what does pay apparently is the flow of sitters who tak the bait and give replica orders.

* * *

THERE is another point that is too often lost sight of. A professional photographer seems to be under the impressio that, because he is a professional, the public ought to d certain things (always in his interest), and that he has certai "rights." We need scarcely say this is not so. In the ol times men kept what they had got by their strong right arm now they earn by force of brain or special skill. For example if, for the nonce, it be granted that a guinea a dozen is a fai price for first-class cabinet portraits, it is not to be expecte for a moment that second-class work shall obtain a simila price, yet this contention is at the bottom of most of th complaints of bad prices. To bring this to a point, it mean that the public will be photographed by any one they like and they will like those who offer them facilities and do good work. Hence, what our correspondent should do in the matter he complains of is not to sit down and whine, but to be up and doing. Cannot he circular his own district, and offer to do the same thing on the same terms? We have seen some of these photographs; they are only of fair average merit, and not done at cutting prices—so far. If our correspondent be a good workman, he should be able to hold his own and more against people who have travelling expenses to pay, and assistants who are strange to the neighbourhood and have no personal connexion at all in his own district.

* * *

WE admit that this poaching is sad, but, for those of the rank and file who cannot lay claim to special artistic abilities, the signs of the times are obvious and unmistakable. Photography has become a business in the majority of cases, and will only there succeed when run on commercial principles.

THE SPEED OF PLATES: MESSRS. HURTER & DRIFFIELD'S THEORY PRACTICALLY TESTED.

II.

As suggested in our previous article, the half-dozen boxes of plates that we handed to Mr. Driffield for our experiments were, as regards the names of the brands and the makers, as well as their rapidities, unknown to him; indeed, the more completely to carry out Mr. Driffield's suggestion that he should be quite in the dark in this respect, the packages of plates were placed in strange boxes, private marks on which permitted us to identify the contents.

A strip from each plate was cut off, and the strips were placed in a special dark back, which, being inserted in the exposing apparatus, a series of exposures was given to the standard light (in this case the amyl-acetate lamp) at a distance of one metre from the plate. Each strip, of course, received identically the same exposures. Upon development in the standard ferrous-oxalate developer (this was used at a temperature of 65° throughout all the experiments), it was found that the exposures thus tentatively given were too short for two of the six plates, and thus it was necessary to repeat the experiment with these two plates in order that all the plates should receive a range of exposures practically commensurate with their scale of sensitiveness. The exposures given on the first occasion ranged from 0·312 to 40 cm., and, on the second occasion, from 1·25 to 1·60 cm.

Of the six strips thus developed, three were selected for further experiment, the three rejected strips yielding such an amount of fog as to render them, in the opinion of Messrs. Hurter & Driffield, generally unfit for use. The time of development of the three selected strips was as follows:—

	A.	C.	F.
	5½ ...	3½ ...	7 minutes.
Development factor reached	0·78 ...	1·88 ...	0·74

It will be noted that, while the speeds of the plates C and F are identical, they vary considerably in the time required to reach a given development factor. After development, the strips were washed, cleared in an acidified alum bath—an important point, having regard to the necessity of obtaining a perfectly clear and stainless deposit for measurement in the photometer. Again, before being placed in the photometer, the strips were cleaned on the glass sides and warmed so as to expel moisture. We mention these minutiæ of experimental exactitude as instances of the care taken to avoid the vitiation of results.

We append the particulars of the readings of the three strips in the photometer, as well as the inertia and the speed numbers. It is of interest perhaps to remark that, although we had never previously made a reading in the photometer, we, at the second attempt, verified the essential numbers obtained by Mr. Driffield. The identities of the plates were as follows:—

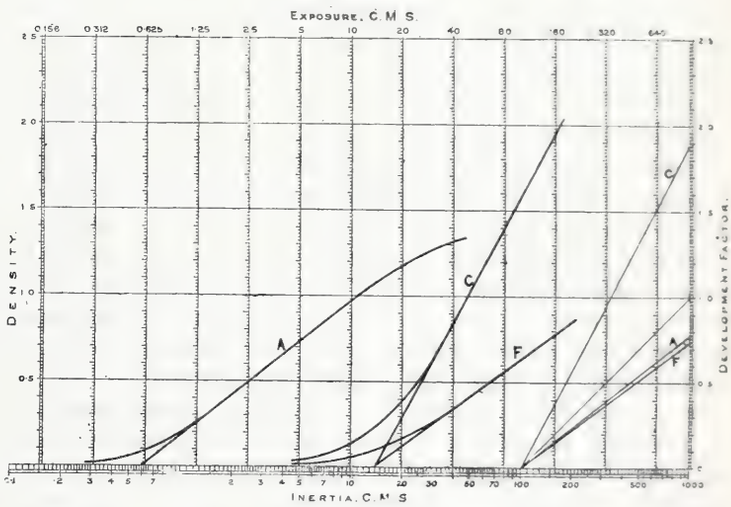
A. Photo-mechanical.
C. A "portrait" plate.
F. A slow ordinary plate, marked 14° Warnerke.

The characteristic curves of the plates are reproduced in the annexed diagram, from which it will be seen that A, instead of being the slowest plate of the three, is in reality very considerably more rapid than the other two. C, which should have been the fastest of the three, really proved to be as slow as an admittedly slow plate.

	A.	C.	F.
Fog.	·090	·070	·135
·312	·020	—	—
·625	·095	—	—
1·25	·270	—	—
2 5	·500	—	—
5	·735	·045	·010
10	·970	·140	·060
20	1·170	·400	·170
40	1·320	·845	·350
80	—	1·400	·565
160	—	1·950	·785
	$i = 0·6$	$i = 14$	$i = 14$
	$s = 78$	$s = 3\,3$	$s = 3·3$

Speed, with amyl-acetate lamp used, $\frac{4·7}{i}$

HURTER & DRIFFIELD'S METHOD OF SPEED DETERMINATION.



The essential data of the speeds of the plates having been ascertained, the next step was to calculate the camera exposures, and, these being arrived at, to subject those exposures to actual trial. In these calculations the well-known actinograph was employed, but with the additional precaution of actually measuring the value of the light at the time. This was done by means of an instrument which absorbs light without setting up chemical decomposition, and in which the resultant heat affords a measurable indication of the value of the light. This instrument shows the difference in temperature between a red and a white glass bulb when both are exposed to light together. The calculated exposures were relatively as follows:—

A.	C.	F.
1	24	24

A was exposed on ourselves, C and F on a coloured statue. On development in the standard ferrous-oxalate solution, the exposures proved to be correct. Prints from the negatives are in our possession, and a mere inspection of them is sufficient to attest the fact that the practicability of correctly calculating exposures from the data supplied by the measurement of the densities of test strips of the plates, with which we had supplied Mr. Driffield, had been fully demonstrated by that gentleman.

We have laid stress on the series of experiments heretofore described as proving that Messrs. Hurter & Driffield's system of determining the speed of a plate allows of the correct camera

exposure being calculated for practical purposes, for the reason that, in the discussions on the subject that have taken place in recent years, this aspect of the matter has perhaps not received the attention it merits. To our mind, nothing could more satisfactorily establish the soundness of the Hurter & Driffield work than that the measurements obtained in the photometer are so readily susceptible to reduction to the arithmetical expression of an actual exposure in the camera.

But it is obvious that the system appeals with equal, if not greater, force to the plate-maker than to the photographer. The characteristic curve of a plate, as it is plotted out on the diagram provided for the purpose, tells, in effect, not only the camera speed of that plate, but also its peculiar qualities and suitability for a particular kind of work.

DOUBTFUL MOUNTANTS.

It is very important to professional photographers who value their reputation, and to amateurs who treasure their work, that the stability of the pictures should not suffer from the use of a pernicious mountant. This subject has frequently been discussed in these columns. There is no question that decomposed starch paste, acid gelatine, gum, &c., are accountable for the fading of many valuable photographs. So also is the use of some of the ready-made adhesives that contain injurious materials, introduced as antiseptics — bichloride of mercury, for example, which was, and still is, a favourite one, indeed it would be difficult to find a better. It does no harm when used for the purposes for which cements of this kind are generally employed, but it will be obvious to all what its action would be on silver prints mounted with a medium containing it.

One of our correspondents, a professional photographer in the provinces, has sent us a correspondence he has lately had with the London agents of a foreign house that supplies, amongst other things, a paste for library and office purposes, and said by the makers to be specially suitable for mounting photographs with. He ordered a quantity of it, and noticed that, after a bottle (which had a brush in it with a metal mount) had been open for a week or two, the paste had turned strongly green round the metal. This led him to test for acidity, and he says he found that blue litmus paper turned to a bright red instantly. On writing to the London agents for the paste, they replied, denying that any acid was used in its manufacture, though they were willing to take the whole of the paste back, and credit it, which they did. The manufacturers of the material subsequently wrote that "our manufactory is presided over by chemists of high standing, graduates of the best European Universities," &c., and added that the paste did contain an antiseptic which possessed an acid reaction to litmus paper, but it was added, that it was "to prevent the action of microbes on the paste," and would have no action on photographs. They also said that litmus was not to be relied upon as a test for acidity.

Our correspondent desires our opinion on the paste as a mountant, and also wants to know what antiseptics would be perfectly harmless in a photographic mountant. In answer to the first part of the query, we may at once say that we know nothing whatever of the paste in question or its composition, neither have we even seen a sample of it. We may say, however, that we should not think of using any paste that changed blue litmus paper to a bright red instantly, and also turned metal green, for mounting any photograph we valued, unless indeed we were fully aware of its composition, and, by that, convinced of its inertness. This is a thing that purchasers are not likely to know anything about, inasmuch as the makers of adhesives of this kind treat their compositions as trade secrets. The injurious action that mountants may eventually have on a silver print cannot be tested in a few weeks or months, for it may be slowly going on for years, and yet be the real cause of the destruction of the picture; hence, it will be seen, there was good ground for our correspondent's distrust of the paste in question.

With regard to the second part of our correspondent's query, we may say we are not in favour of any antiseptics, as we prefer to make up a little of the mountant we generally employ, starch, as we require it. The trouble and cost of making up a little starch paste as required is so trivial as not to be worth consideration; and starch has proved itself, by the test of time, to be one of the most reliable mountants that can be used. As antiseptics are, however, asked for, we may, with safety, mention that oil of cloves, alcohol, creosote, and salicylic acid may be accepted as being amongst the best that can be used for the present purpose.

One of the best and most reliable mountants for photographs, that will keep well, is that we have frequently recommended, namely, a solution of gelatine containing alcohol, and this has the further great advantage that prints may be mounted with it without the mounts materially cockling; but this has the disadvantage of having to be slightly warmed before use, which is looked upon as a trouble by some.

The gelatine used must be free from acid, and that is the case with most of the English-made gelatines, but rarely so with the foreign ones. One of the most suitable and reliable for the purpose we know is Nelson's "No. 2 Soluble." Four ounces of this are soaked and dissolved in twelve ounces of water, and a quarter of an ounce of glycerine added. Then, while still warm, five or six ounces of methylated alcohol, free from the mineral spirit, are stirred in. The solution is then put into wide-mouth bottles and corked up. When the mountant has to be used, the bottle is stood in a vessel of warm water for a few minutes, when the contents will become liquid. We have kept this mountant for several years without the slightest deterioration. This was due to the antiseptic properties of the spirit, and that has no injurious effect whatever on silver prints.

Collotype Varnish.—Berold recommends the following varnish for collotype prints, which gives them a surface like an ordinary silver print:—

Powdered bleached shellac	25	parts.
Alcohol	85	„
Ammonia	65	„
Boiling water	125	„
Glycerine	6	„
Dextrine	0·25	„

The shellac gives the glaze, the ammonia removes any grease from the print, and the glycerine prevents the cracking of the varnish when dry.

Some Peculiarities of X Rays.—There were recently presented to the Paris Academy of Sciences papers on this subject, possessing some photographic interest. Mr. G. Sagnac showed how the rays, after striking upon metal, are selectively absorbed, those afterwards emitted possessing very different properties as regards penetrative powers from the usual kind. M. P. Villard explained

ne foggy appearance of Röntgen ray negatives. It is not caused by portion of the rays penetrating everything in their way, and so ausing fog, but he believes the fluorescence of the surrounding air o be the source of the second image. The difficulty of obtaining a ood image of the thorax is set down by M. Villard to this cause.

A New Measure of Actinism.—At a recent meeting of the Chemical Society, Mr. R. J. Friswell gave an account of his experiments with a solution of nitro-benzine in strong sulphuric acid, which, he has discovered, turns black when exposed to light. "When solution in pure concentrated acid is exposed to light, it slowly darkens. When exposed to direct sunlight, the darkening goes on with great rapidity, and in a few minutes the solution becomes quite black and opaque, then the action ceases. The light from burning magnesium produces the same effect. The solution has been kept unchanged in the dark for upwards of four years." In the ensuing discussion, the President said, if a flash of magnesium light were permitted to fall on the nitro-benzine solution through a quartz window, he thought that the blackening would furnish a good lecture illustration.

A National Testing Laboratory.—The Treasury have appointed a small committee "to consider and report upon the desirability of establishing a National Physical Laboratory for the testing and verification of instruments for physical investigation, for the construction and preservation of standards of measurement, and for the systematic determination of physical constants, and numerical data useful for scientific and industrial purposes, and to report whether the work of such an institution, if established, could be associated with any testing or standardising work already performed wholly or partially at public cost." This suggests a possible supersession of the Kew Observatory work as far as regards thermometer and lens testing, &c., although judging from the small amount of employment in photographic directions given to the Kew officials, it will not greatly interest photographers generally; the greater the pity.

Alchemy in the Nineteenth Century.—As anything in connexion with the supply and price of the precious metals has strong interest for photographers, and the topic of the long-sought method of the transmutation of metals being again before the public, a few brief notes upon it may not be without value. Up to a very recent period scientific men looked down with serene scorn and contempt upon any suggestion of processes having for their end this object; but now, in the light of modern ideas upon the constitution of matter, we opine that there are not a few men of light and leading who would not for one moment deny the possibility of the discovery, if not of the philosopher's stone, at any rate of a means of producing gold from a substance that, in the ordinary sense of the term, did not contain it. Be that as it may, there appeared in last week's *Chemical News* an account of "Recent Progress of Alchemy in America."

It appears from it that there have lately been several claimants to the discovery of the coveted process, and a description of their proceedings shows a curious mixture of charlatanry and real science in methods. First, we have a clever, educated French chemist claiming the power of transmutation. He had many converts, but eventually was interviewed by the law courts, with a *finale* unsatisfactory to himself. Then we have a man who started life as a policeman, and, after a chequered career, appeared in the *rôle* of alchemist. He was twice refused the granting of a patent for his process; but his pertinacity was so great that eventually a big experimental trial was given to his method. It is difficult to come to any conclusion as to whether or no he deceived himself; still he seems really to have obtained gold, but, instead of "creating" it, he merely extracted it from crude minerals in which it had long been known by experts to exist. The importance attached to his claim may be seen by the report on it by the Master of the Mint, who, with his staff, was engaged three weeks in the investigation.

Finally, we come to Mr. Stephen H. Emmens, a well-known chemist of New York, member of several learned societies, and author of various papers on electricity, chemistry, and metallurgy. He claims not only to have attained the knowledge of transmutation, but to have put it to the test by the sale to the Assay Office of six ingots of mixed gold and silver, for which he has received close on $1000. He has published a pamphlet, in which he describes the steps in his discovery, the first steps in it having been founded on our late esteemed correspondent, Mr. Carey Lea's discoveries in the salts of silver that he termed photo-salts, and there the matter stands. He says, "I have every confidence that the production of argentaurum gold will be brought up to 50,000 ounces monthly within a year."

BY THE WAY.

It is generally considered to be an exhibition of conversational weakness when "the weather" is chosen as a topic; but, I think the subject is one in connexion with which photographers, at any rate, may claim a little privilege, and so I venture to open my notes with a reference to the abnormally long spell of truly photographic weather that we have been favoured with this summer. Not only did the Jubilee celebrations pass off without a hitch, but the almost equally important—to photographers, at least—Convention proceedings were carried through in uninterruptedly fine weather, and, while the enjoyment of those present was unmarred by any interference on the part of the clerk of the weather, they can have no possible excuse for not making a good show of photographic results.

It is just possible, however, though not very likely, where "two or three are gathered together" with similar objects in view—to wit, picture-making—that a sort of feeling of surfeit may occasionally militate against picture-production, even though the conditions may be, in every sense, favourable, or even tempting. I know, myself, that one of my worst records, in years gone by, was the summer of 1868, which was a particularly favourable one for outdoor photography; but it closed upon my operations with a very beggarly show of negatives when compared with other less favourable seasons. There is this much to be said of that year, however, which will scarcely apply to the present one, that it was one of the most unbearably hot summers of the century, if not *the* hottest, and that fact alone would go a long way towards supplying an excuse for laziness in most cases. I spent some weeks during July and August in the midst of lovely scenery; but for days together the camera was never touched, and during a portion of the time there were two other amateurs staying at the same hotel who were playing a very similar game. One of them was a "wet" man, with 12 × 10 camera and all the paraphernalia of tent, &c., and in his case I will admit there was some excuse for not attempting very much in weather, when, according to current hotel gossip, the thermometer had been as high as 102° in the shade (!) on the verandah. Whether that particular thermometer had passed the Kew test I am unable to say, but it was an undisputed fact that the weather was justly described as "jolly hot."

But this year has not, so far as I am aware, been remarkable for any very high temperatures, at any rate for any lengthened period at a time; and yet, wherever I go amongst photographic friends, I find pretty nearly the same story of little work done. The fact seems to be, that the favourable weather crept upon us gradually without any fuss, and we have got as gradually used to it, that the temptation to camera work has died out. Now, in some of the series of persistently wet seasons that prevailed a few years back, a single fine day sandwiched in would have drawn out pretty nearly every camera man in Christendom who was his own master or at all able to arrange for a holiday; but, with such a continued succession of fine weather, the inclination is rather to put things off for some fancied reason or another, until it is not quite so "close," or there is a little less breeze—anything, in fact, for an excuse.

But there is another point of view from which the matter may be studied, namely, the suitability of very fine weather—*i.e.*, days of all sunshine and little or no wind—for the production of the finest

effects. I was taught to believe, very many years ago, and still have faith in the formula, that the best effects are obtainable in showery weather, when "sunshine follows rain." I think any experienced outdoor worker will agree with me on that score, though some of us may possibly differ as to whether the absolutely best results are got with or without sunshine. But, when it comes to day following day without a drop of rain to clear the atmosphere, although the time may be eminently suited to picnics, and "bean-feasts," and "wayzegooses" (or should it be wayz*egeese*?), and such-like, I do not think the conditions are generally favourable to photography. I was set thinking in this and similar directions by the remark of a friend whom I wanted to accompany me with his camera on one of the loveliest days of last month. "What! go photographing *on a beastly fine day like this?* No, thank you." My friend is a bit of an "impressionist," and loves to deal with Nature in her sombre rather than her sunny moods; hence, perhaps, his objection to the day; or, possibly, that was only *his* excuse for laziness.

Though wilful neglect of the camera may cause after-regret when the chances are past, the feeling will certainly not be as poignant as that which sets in after a practically enforced abstention from its use when lovely subjects abound. I found myself the victim of such circumstances two or three weeks ago, after a hard and tiring day's work, without a single plate exposed. I try and console myself that it served me right, but that does not greatly modify the aggravation. Time was when I thought very little of a thirty-mile, or even longer, tramp with the camera between sunrise and 'set, and even now I can do my share of walking. So, finding myself within a few miles of a pretty country that I knew very well by hearsay, I resolved to make personal acquaintance with it. But there were no means of conveyance, the place lying between two of the great trunk lines to the north, in a part of the country where everything—roads, rivers, and railways—all seem to go north and south, the only communication between east and west being made by a species of tacking. However, after studying the map, I found that, at the expense of a walk of perhaps a dozen or fourteen miles, I could pass right through the part I wanted to see, and then strike a railway line which, by the tacking process mentioned and two or three changes, would bring me back to within three or four miles of my starting point.

So off I went, taking, for precaution's sake, the map in my pocket. Alas! for the "best-laid" schemes we hear so much about! The map turned out to be forty or fifty years old, or based on a survey of that age, and soon proved to be utterly useless; but, with the general bearings in my head, I resolved to persevere, with the result that I got hopelessly lost. Now, some people who live in the country think it must be dreadful to get "lost in London," but I tell them *they can't*. If in the streets of London you find you "don't know where you are," you have only to "ask a policeman," or any passer-by, and either will direct you; or, if you are too proud to betray your ignorance of London geography, you have only to hail the first hansom you come across and order the driver to take you back to civilisation; but in the country you will find that you have neither police nor hansoms, nor, apparently, population, and you may travel for miles, as I did, with nothing or nobody to commune with except yourself and sundry weatherbeaten substitutes for guide posts, which simply direct you to certain places you never heard of, and, not having a complete and universal gazetteer in your pocket, don't add much to your enlightenment.

So it happened that I travelled for four or five hours without seeing a living being, bar a flock of sheep tended by a boy who seemed a step lower in the grade of intelligence than his charges, and with nothing to guide me but the sun, by which means I tried as well as the roads would let me to bear in the general direction in which I supposed I ought to go. At last, long after midnight, I "struck" a village, when, on inquiring, I found I was still ten or eleven miles from the station I had been aiming for; that I should pass through the district I wanted to photograph, but that it would "take me all my time" to catch the only train that would be of any use to me. Inquiries as to a conveyance led to a discussion of the whereabouts of every wheeled thing within a radius of two or three miles—they did not amount to many, but they were all known to be engaged on some job or other. That *is* one advantage in the country, everybody knows everybody else's business up to the handle.

There was nothing for it then but to carry out my original intention in regard to return by rail; I could not go back a nearer way than I had come, and that was a longer walk than to the station, so I chose the latter. As for attempting to get a lodging for the night, I anticipated it could only have been arranged, if at all, on similar terms to those that were offered me once in Wales, by the good wife giving up her half share of the bed to me, so I had to push on at top speed, and, as I began by saying, I passed all my lovely subjects at the rate of over four miles an hour, just caught my train and landed back without opening the camera, after a walk of about eight-and-twenty miles, besides a railway journey of about twenty! Need I repeat that my feelings of one sort and another were particularly "poignant?"

There is one moral I would bring to the notice of travelling photographers as well as cyclists, namely, to be sure of the maps you trust to in an unknown district. Cycle maps I have always understood to be most carefully looked after, but the one that misled me is of that class with the roads specially coloured for cyclists' use. Yet one *main road* between two towns of some importance, part of which I passed over, is there marked as a simple foot track, which it was about forty or fifty years ago. If the rest of the map is equally reliable, it is not worth much. DOGBERRY.

HISTORICAL PHOTOGRAPHS IN THE PHOTOGRAPHIC SECTION OF THE IMPERIAL VICTORIAN EXHIBITION AT THE CRYSTAL PALACE.

I.

In describing the objects of historical interest in the Exhibition which has been organized for the Crystal Palace Company by Messrs. Negretti & Zambra, it will be well to commence with the first process that was published; by first is meant the first commercially practical process of photography—the Daguerreotype. Although that was the first published, it only antedated the publication of the late Mr. H. Fox Talbot's Calotype process by less than a month. Still, it was first, therefore it will be the first alluded to here.

Some writers, who know little, if anything, either practically or theoretically, of the Daguerreotype process, usually describe it as being a very slow one, and talk of people, sometimes clothed in white and with whitened faces, having to sit for half an hour or so in direct sunlight in order to obtain a portrait. That, however, is not altogether incorrect in the earliest days of the process, though the statement requires considerable qualification, as regards the process itself, even in its earliest stages. It certainly was not such a very slow one in its later days.

In one of the cases is a Daguerreotype, a portrait of a gentleman, lent, amongst others of later date, by Messrs. Jas. Martin & Co., which was taken in 1840, and received an exposure of twenty minutes; it will be noticed that the eyes and the eyebrows are painted in. Next to it is an instantaneous picture of *New York Harbour*, taken later on by the late Mr. William England (lent by Mr. L. W. England), and a very fine Daguerreotype it is, as it will compare very favourably with modern instantaneous views. The paddle wheels of a steamer under full steam, and the waves, are as sharply depicted as in a modern photograph. These two pictures serve admirably to illustrate the advancement made in the process in the course of a few years.

Before alluding to the different exhibits, it will perhaps be as well to describe briefly the process as published by its inventor, Daguerre, and the improvements made afterwards, for the benefit of modern photographers, many of whom have a very vague idea of what it is. Only two or three years ago, for example, a writer in a contemporary actually described a Daguerreotype as a picture taken on a silver plate, "and intensified with bichloride of mercury." The process, as first published, was this: A silver plate, or one of copper plated with silver, was brought to a high degree of polish, indeed till it appeared quite black. It was then submitted to the fumes of iodine, so that a thin film of iodide of silver was formed on its surface. It was then ready for exposure in the camera, and a very long exposure it had to be, for the plate was very insensitive. But this extreme insensitiveness requires some qualification, and will be alluded to presently.

After exposure in the camera the picture was developed by subjecting the plate to the fumes from mercury heated to about 140°, which condensed upon the parts acted upon by light, and so formed the image. The picture was then fixed with a solution of salt and water, or one of hyposulphite of soda—the latter was the fixing agent finally adopted. That is how the picture that had the twenty minutes' exposure, in 1840, was produced.

During the year this picture was made Mr. Goddard discovered that if after the plate had been treated with the vapour of iodine, it was further submitted to that of bromine, so that an iodo-bromide of silver was formed, its sensitiveness was increased in a marvellous degree; also that the image, when developed, was much more vigorous than when iodide alone was used. In the same year Fizeau introduced the method of toning the image, after fixing, with gold, which very much increased its vigour and brilliancy, while, at the same time, it rendered the Daguerreotype one of the, if not the, most permanent of all silver pictures. Another improvement, a little later on, that was introduced was this: before the plate was finally polished, to deposit on the surface a thin layer of silver, by electrotyping. This secured a film of pure silver for the iodine and bromide to act upon, instead of an alloy. It was by utilising these various improvements to the full—which, by the way, were all made during the very early days of the process—that the very fine Daguerreotypes now on view were obtained. It will be noticed that the Daguerreotype is a "dry process," for the plate is not wetted at all until the image is ready for fixing.

It is mentioned above that the extreme insensitiveness of the early Daguerreotype process required some qualification. Modern writers on the subject, when quoting the long exposures necessary, have not taken the lenses then used into consideration. They were single lenses, often unachromatised, and had to be worked with very small apertures—*f*-15 or *f*-20—in order to get even fair definition. Later on, the Petzval lens was introduced, having an aperture of *f*-4, and, had that been used instead of the one that necessitated the twenty minutes' exposure, probably one minute's exposure would have sufficed, so it will be seen that the Daguerreotype process, even in its earliest days, was not really the very slow one that it is so often represented to have been. With the Petzval lens the Daguerreotype process, as worked in its later days, compared very favourably with that of wet collodion. Portraits used to be taken with a fair light in the studio with from five to twenty seconds' exposure, often less, and, as in the case of the one of New York Harbour (No. 309), "instantaneously."

Next that picture is a Daguerreotype portrait of Daguerre himself (No. 308), also lent by Mr. L. W. England. Mr. J. Willats has lent some very early, and highly interesting, Daguerreotypes; one is a portrait of the late Mr. Thomas Willats, and another is one of the late Mr. Richard Willats (1843). The Messrs. Willats, who were then located in Cheapside and Ironmonger-lane, were about the first in London to make a speciality of photographic appliances and material. They were also ardent experimentalists in the then new process. Amongst these gentlemen's work is a Daguerreotype (No. 330) of the London and Birmingham Railway—now the London and North-Western Railway—Chalk Farm, 1845; another (No. 329) of Chalk-farm Fair, 1846. Another very interesting work of Willats' is an electrotype from a Daguerreotype, made about the same period. Many are not aware that Daguerreotypes can be reproduced by the electrotype process, but such is the case, and No. 331 is an example.

Amongst the very early Daguerreotypes are some lent by Mr. Henry Cooper (Morley & Cooper)—a portrait group of a lady and child, 1845, also a view of Temple Church, Cambridge, of about the same date. Mr. W. White has a frame of Daguerreotypes (No. 192) on one of the screens, taken with a single lens in 1843–4. They are of more than passing interest, inasmuch as they are chiefly views of Sydenham and Dulwich, both of which were then very different places from what they are now.

Mr. H. N. King has lent the first Daguerreotype (No. 223) he took, date 1847. From this it will be seen that Mr. King is no novice in photography. By the side of this picture is a Daguerreotype of the late Mr. Vernon Heath, taken by Claudet about 1844.

Mr. Jerrard (successor to Claudet) has lent some examples of the late Mr. Claudet's work; two very fine stereoscopic coloured portraits, also some views of the interior of the Exhibition of 1851 (Nos. 332–5), about 9 × 7, and what will probably strike the observer is the straightness of the columns and girders of the building, even at the margins, and they were, of course, taken anterior to the introduction of rectilinear lenses. Quite a little history attaches to these pictures. They were discovered a few months back in a lumber room, in an old plate box without a lid, and not protected in any way from the atmosphere or dust, where they had probably been from the time they were taken. They were covered with dust and, apparently, condensed smoke, for the premises were almost entirely destroyed by fire shortly after Mr. Claudet's death in 1867. It was difficult indeed to discover even a trace of an image on some of the plates. However, they were carefully cleaned, "restored," and then it was evident why they had thus been neglected. They had, no doubt, been rejected as not being up to Claudet's usual work; some were under, and some were over-exposed, but they serve to illustrate the permanence of the Daguerrian image under the most adverse conditions.

Some excellent Daguerreotypes, of later date, are lent by Mr. E. W. Foxlee, several of them coloured; one (No. 320) by Kilburn, is a fine specimen of colouring as well as of a Daguerreotype. The colouring of Daguerreotypes, it may be mentioned, was always done with powder colours. Among the later examples of the Daguerreotype process is a frame of twenty-four small pictures, on one of the tables, mostly views in the Crystal Palace, 1854–7, taken, and lent, by Messrs. Negretti & Zambra. This Exhibition serves to illustrate the perfection the process had attained, before its demise, in the hands of expert workers.

It is not too much to say that the collection of Daguerreotypes now on view at the Crystal Palace is the finest and most complete, from the most primitive state of the process down to its latest date, that has ever been got together, and it seems a pity that it has to be dispersed again.

THE PRINTING-OUT PLATINOTYPE PROCESS.

The statement made by Mr. Cembrano in his Presidential speech before the Convention at Yarmouth, which was to the effect that "a paper is much needed possessing the ease and simplicity of manipulation, permanency of results, and beauty in quality of platinotype, combined with the certainty in printing of what are commonly called printing-out papers," naturally suggests to one the printing-out platinotype process, which seems to have been much neglected in England.

This process was suggested by Pizzighelli in 1887, and differs from the other platinotype processes in that the developer is in the sensitising solution. As a rule, sodium ferric oxalate is used, which, by exposure to light, is reduced to sodium ferrous oxalate and sodium oxalate, according to the equation:—

$$Na_6Fe_2(C_2O_4)6 = Na_2Fe_2(C_2O_4)_3 + 2Na_2C_2O_4 + 2CO_2.$$

Sodium ferric oxalate occurs in fairly large green crystals, which are perfectly stable in the dark, and are easily soluble in water (about one in two), and when spread on paper it gives a yellowish green film.

As damp is necessary for the full development of the image, it is necessary to expose it to aqueous vapour before printing; otherwise the printing is precisely the same as for any other of the platinotype papers. The best way of damping the paper is to fill a developing dish with warm water, and just hold the paper for about three minutes in summer and one and a half minutes in winter, film face downwards over the same. It is frequently recommended to breathe on the paper whilst it is in the printing frame; but this is hardly to be commended, for the simple reason that part of the paper near the middle of the frame, as a rule, gets less moisture, and therefore shows fainter in the finished print; further than that, the negative, unless covered with a piece of plain paper, also becomes moist and absorbs some of the platinum or iron salts, and thus stains are caused which are extremely difficult to eradicate.

For this process there is no doubt that Rives or Saxe papers are the best, though Whatman's or Creswick papers may be used.

The sensitising salts should be made up into the form of stock solutions. The sodium ferric oxalate solution should be made by dissolving, by the aid of a gentle heat, 240 grains in 1 ounce of distilled water, and the solution filtered and labelled "The iron solution."

The chloro-platinite of potash may be dissolved in the proportion of 1 : 6, or a 15-grain tube in 90 minims of distilled water.

Besides these will be required a ten per cent. solution of sodio-chloride of platinum, which is added to the sensitising solution to give brilliancy or greater contrast, and is especially useful for thin, flat negatives.

A solution of gum arabic must also be used, and 1 ounce of the best white gum arabic in lumps should be dissolved by constant stirring in 2 ounces of distilled water, and then filtered through nainsook, using pressure if necessary.

The sensitising solution itself is prepared by mixing together, preferably in a flat dish or saucer—

Chloro-platinite solution	116 minims.
Iron solution	120 ,,
Gum arabic	116 ,,

The above quantity is sufficient for 480 square inches of paper. The

solution should be brushed over the paper with a broad, flat brush, not too soft, and then the marks evened out with another brush till it has lost all glaze, then quickly dried, and the process of drying should not take more than half an hour. Great care should be exercised in the choice of the brushes. A soft camel's-hair brush will mop up too much solution, whilst a hard brush is apt to cause marks in the sensitising.

Sepia-toned pictures may be obtained by the addition of palladium or mercury salts to the sensitisers, but the results obtained by these are by no means satisfactory, nor is there any good method of obtaining sepia tones direct by this process.

Mercury gives, as a rule, yellowish whites, and the tones are not even, that is to say, the high lights may be sepia, the half-tones grey, and the shadows black. With palladium the difficulty is to keep the paper, and it must be printed out dry and then developed, or else variations in tone and general reduction may ensue.

A formula strongly recommended by Watzek for the mercurial paper is:—

Sodium ferric oxalate solution	168 minims.
Potassium chloro-platinite solution	100 ,,
Potassium chlorate solution	4 drops.
Mercuric chloride solution	84 minims.

All these solutions should be saturated. It will be found necessary, if this be used, to give the raw paper at least two coatings of plain two per cent. arrowroot size; but it is preferable to use the gum arabic solution in about the same proportion as suggested for the black paper, and also to replace the chlorate of potash by a like quantity of sodio-chloride of platinum, which keeps the whites purer.

For the palladium paper the following may be used:—

Iron solution	120 minims.
Chloro-platinite solution	80 ,,
Potassio-chloride of palladium solution (1:8)	20 ,,
Gum arabic solution	116 ,,

It must not be forgotten that this paper must be absolutely dry during printing, and only developed by steam afterwards.

The subsequent treatment of these prints is precisely the same as for ordinary platinotypes, namely, the use of the three acid clearing baths, and then well washing, and they are also amenable to the process of uranium toning or the toning process lately suggested by Mr. A. Peebles Smith.

The process is not a difficult one to work, nor is it difficult to prepare the paper oneself, the chief difficulty lying in the drying.

IODATED SALT AS A HYPO ELIMINATOR.

Notwithstanding all that has been written in these pages against the employment of hypo eliminators, it is not surprising that photographers should continue to resort to their use for the purpose of saving time when chemists are constantly introducing new agents which they state to be perfect substitutes for washing without any counterbalancing disadvantages. Without stopping to argue the question as to whether such a thing as a perfect hypo eliminator exists, or whether any chemical process in any way approaches in efficiency simple washing properly performed, we might, at any rate, expect that chemists should be careful, in launching a new substance on the market, to assure themselves that it is, at least, reasonably free from danger.

In a recent Journal is a description of a new eliminator introduced by M. Mercier under the name of iodated salt, which, as usual, is alleged to be perfectly harmless, but which I have not the least hesitation in saying, from actual experience, will be found one of the most dangerous eliminators yet put forward. I can show numerous negatives, and have destroyed many others during the past three or four years that have been ruined by practically the same solution as that described by M. Mercier, although it was not used exactly as an eliminator. At the present time I am using the same solution almost daily for quite a different purpose—the clearing of negatives and transparencies—in performing which duties, it exercises properties the very reverse of those required in a hypo eliminator; in fact, the property that gives it its value, for my purpose, is its capacity for attacking the image, which it is said not to possess.

My first experience with the new eliminator came about in this wise: About four years ago, I think, a solution of iodide of potassium was recommended in these columns, not as an eliminator, but as a "detector," of imperfectly fixed plates, and, as I was at the time using some particularly thick films, which were very difficult to fix, I determined to try the iodide test. It acts, it is almost needless to say, by converting any silver remaining in the film into iodide, which, by reason of its lower degree of solubility in hypo, is immediately precipitated in a visible form, and must be removed by a second immersion in the fixing bath. Here I may remark that this would be the first action of "iodated salt," so that, if any considerable quantity of silver remained, whether in the soluble or insoluble form, its value as an "eliminator" may be estimated. It happened that I had no iodide of potassium about the place, but I found the remains of a half-pound bottle of iodide of ammonium that I had had in stock for four or five years, and which had deliquesced and become deeply coloured by decomposition or liberation of iodine. However, this was dissolved, and carbonate of ammonia added to take up the free iodine; but, although the solution was rendered alkaline, it retained its colour. I was naturally suspicious of this mixture, and only used it on one or two negatives of no special value, which justified my doubts by assuming a lemon yellow colour all over in a very few days.

But a fresh and colourless solution was made by dissolving iodine in either carbonate of soda or carbonate of ammonia, I do not recollect which—the result in either case would be practically the same as the iodated salt. This solution I regarded as a mixture of iodide and iodate of the base with a slight excess of the carbonate to ensure the conversion of the whole of the iodine, and as such I used it with a full belief in its perfect safety. When applied to an imperfectly fixed negative, it promptly formed a dense precipitate of iodide of silver in those portions of the film insufficiently acted upon by the hypo, and this was then removed by a second fixation, followed by a reapplication of the "detector." In all cases this was followed by a thorough washing, for it must be borne in mind that the use of the iodide was in no sense expected to lessen the necessity for that operation, and, owing to the extraordinary thickness of the films in use, I may safely say that they had at least their fair share of soaking and changing.

Winter came, and with it a cessation of photographic operations, printing and otherwise; and it was consequently some months before, on opening a box of negatives that had been packed away, I made the first discovery of any change. But at that time it was apparently complete, and consisted in a complete yellowing of the whole film, not in the usual manner of an insufficiently fixed and washed plate, but to an even lemon or primrose yellow, evidently from conversion of the image into iodide of silver. I am convinced, though I cannot state so definitely, that every negative treated at that period with the iodide solution had within a few months faded to this bright yellow colour. My reason for believing this is that nearly all the others taken about the same time exhibit, more or less, traces of the ordinary form of hypo fading, which is perfectly distinct in character, and may vary in degree, whereas the iodised effect is decisive and uniform in every case.

It would be incorrect to say that the result is easily accounted for, but at least it may be partly surmised how the changes come about. The apparently harmless solution I substituted for iodide of potassium, and which M. Mercier introduces as an eliminator, is, in reality, one of very indefinite and probably unstable composition as is noticed in his article; but he passes over, without any allusion to its dangerous character or even its properties as an eliminator, one of the compounds supposed, by Schönbein on the one hand, and again by Leussen and Löwenthal, to exist in solutions in which iodine has been treated with an alkali or an alkaline salt. I refer to the hypoiodite (not hyperiodide as printed recently).

Hypoiodous acid is the name given to the lowest oxygen compound of iodine, and, although very little is known of it or its salts, and it is doubtful whether they exist in the separate state, experiments have rendered it probable. Moreover, the similarity in chemical behaviour between iodine, and chlorine, and bromine, renders it still more probable that an iodine compound corresponding with hypochlorous acid should exist, and the chemists above named, as well as others, claim to have identified such an acid, as well as its salts, in various combinations of iodine with alkalies. The solution of iodine in aqueous potash or its carbonate is usually supposed to result in the formation of iodide and iodate of the base, but Schönbein states that the formation of the iodate is preceded by that of the iodite, which gradually passes by oxidation to the former condition.

Hypochlorous acid and the hypochlorites are formed on a commercial scale, in precisely this manner, by passing chlorine gas into a solution of an alkaline carbonate. Therefore it is not difficult to imagine that, by treating solution of iodine with carbonate of soda, or by dissolving the former in the latter, as in M. Mercier's process, hypoiodite of sodium is formed. In his remarks on the composition of the solution, M. Mercier says the iodide and iodate have no action on the hyposulphites, but says nothing whatever about the hypoiodite, but goes on to attribute the

virtues of his solution to "the formation of intermediate compounds, which have no action on the silver image, but act particularly on the hyposulphites."

This omission of all reference to the possible action of the hypoiodites is the more surprising, since the hypochlorites have been used or recommended as hypo eliminators from time immemorial, so to say. Mr. F. W. Hart was, I think, the first, more than thirty years ago, to recommend hypochlorite of soda for the purpose, and, so far as a hypo eliminator can be trusted, I dare say it is as good as anything that can be used, certainly better than the hypoiodite. Then "eau de Javelle" and "Labarraque's solution," as well as "Holmes's ozone bleach," have all had their turn as eliminators, and yet M. Mercier passes over with the merest mention the only known constituent of his solution that can have any possible action as an eliminator.

Now, I am not in the least denying that this solution will act as an eliminator, but what I do deny is the harmless character given to it. So far as the decomposition of the hypo is concerned, it will effect the purpose only on the supposition that it contains hypoiodite, which, by the reaction, is converted into iodide, while the hypo passes into a harmless state. This is all very well if the negative or print has been properly fixed and fairly washed; but suppose it to be unwashed or imperfectly fixed—to contain silver, in fact, that should be removed—the first action of the eliminator is to throw that silver down in the form of iodide, which would scarcely, I think, be considered an improvement either to negative or print, and would certainly necessitate a second fixing. Where is the use of the eliminator, then, if it has to be followed by refixing?

As to its non-action on the silver image, the statement, on the face of it, appears absurd. The hypochlorites, it is well known, act directly upon the silver image, converting it directly into chloride of silver, and the hypoiodite similarly converts it into iodide, as witness my iodised negatives. As I stated in the early part of this article, I use the solution of iodine in sodium carbonate for clearing transparencies. I have to-day poured off some of the supernatant and slightly coloured liquid from the undissolved iodine, and used it until it became quite colourless. Then one-half of a collodion lantern slide was immersed for ten minutes without any alteration, except a very slight change of colour; but, on the application of cyanide of potassium, an immediate reduction and clearing took place. Does that speak of no action on the silver image?

Further comment is scarcely needed. If iodated salt is of any value as an eliminator, surely "eau de javelle" or any of the class of hypochlorites will beat it; but, for my own part, I think it acts better as a reducing agent.

W. B. Bolton.

A NEW LIGHT.

[Allgemeine Photographen Zeitung.]

During the last few years considerable improvements have been made in the various lighting systems. Electricity, gas, and incandescent light, with spirit of petroleum, have appeared, and quite lately acetylene has come to the front; and, although there appears to be a big future before this, it is not quite satisfactory at present.

Last year a good deal was heard of an incandescent light, made by Denayrouse, which should give a very good light, equal, in fact, to about 300-candle power, which was obtained by the admixture of air and gas. This lamp was fitted with a small fan driven by an electromotor, which mixed the gas and air. This, however, was not a success commercially, and Denayrouse has now made a lamp in which this arrangement is not fitted. Very little, however, can be found out about this new lamp, and, at any rate, it is not suitable for projection.

Acetylene generators are plentiful, and no less than 300 patents have been taken out for these, and twenty-five in one month alone in England. Most of these, particularly the smaller kinds, have the great and dangerous fault that they have no generator, or else too small a one. It will be found also that the water is either automatically cut off by the pressure of the acetylene generated or by the turning on stopcock; but there is always some subsequent evolution of gas, as the aqueous vapour formed by the heat of the generation of the acetylene condenses and acts on the carbide. The apparatus in which the water falls drop by drop on the carbide is also dangerous, as there is here no large body of water to reduce the heat generated, and this might lead to an explosion. The larger apparatus, which have not these faults, are quite as safe as the ordinary gas arrangements, but they take up a considerable amount of room and are very dear. Acetylene, when properly prepared and used under normal pressure and when too great heat is avoided, cannot be considered dangerous.

As regards the statements in the lay and technical press as to the explosive qualities of acetylene, there is no doubt that they are much overdrawn, and, as regards the poisonousness, it has been proved that, when the acetylene is prepared from good and pure carbide, it is less poisonous than ordinary house gas. The contamination of the air of a room by the burning of acetylene is, for the same amount of light, considerably less than even with the incandescent gas light, as about one-third of the volume of gas is required. The gas, when made from carbide containing phosphorus, is extremely poisonous and of strong smell, due to the generation of phosphoretted hydrogen. The light itself, in consequence of its intensity and pure white colour, is very suitable for projection and photographic work. It appears to contain all the colours of the spectrum in the same proportion as the sun, and does not appear yellow or even reddish, like petroleum, oil, or ordinary gas, nor greenish, like the incandescent light, nor violet, as is too often the case with the arc light, but a pure white. As to its actinic properties there is no doubt, as I have made portraits with three or four lights without any special reflecting system.

There has been on the market, since 1895, a light of great intensity, which can be compared to many arc lamps, which is very simple in working and also cheap to fit up. This is the Hydro-Press Gas Light, invented by Engineer George Rothgiesser, of Düsseldorf, which may be fitted up wherever gas and water supply are handy.

The pressure of the gas is effected by a "transformationsapparat," which is connected to the water supply. The apparatus, according to the number of the lights, is about 170 cm. high, and about 30 to 40 cm. in diameter; it is very simple in construction, has no movable parts or pipes, and besides the turning on and off of the water needs no attention. The intensity of the light is about 600 c.p., with an hourly consumption of gas of about 400 litres, and of water from 100—300 litres—this is determined by the pressure of the water, the higher the pressure the less water used, so that the cost of working with gas at 16 pfennige and water at 12 pfennige is about 8 to 10 pfennige (= to about 1¼*d.*) per hour; with 600 c.p. and the cost of the renewal of the mantle is about 1 pfennig per hour. The water comes away from the apparatus quite pure, and may be used for washing prints, &c.

The burner is constructed on the same principle as the ordinary incandescent burner, but has a large mixing chamber with seven metal partitions, so that a thorough mixing of the gases takes place, and there is no chance of the flame striking back.

The apparatus is made in four sizes for from two to twenty lamps, and costs from 130 to 520 shillings, and may be obtained from the Hydro-Press-Gas-Gesellschaft, Nürnberg.

R. Jahr.

PHOTOGRAPHIC WORKERS AT WORK.

XVI.—Mr. David Allan, at 157, Whitfield-street.

Although well known to the trade, the business of Mr. David Allan which was established thirty years ago, has only recently come prominently before the photographic public, it being the aim of the firm in future to combine the wholesale and retail branches. This new departure has so far proved extremely successful, and on a recent visit to the firm's premises we had abundant evidence that it has been well justified.

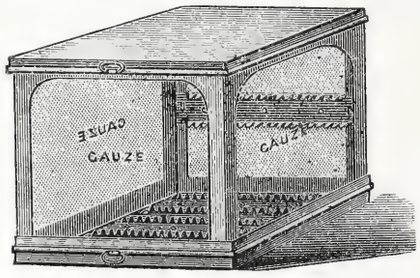
The productions for which David Allan has perhaps hitherto been chiefly noted are such articles as dark-room lamps, washers, and tin, zinc, and iron-ware photographic apparatus generally; but the ordinary wooden cabinet work now also forms a considerable part of the output. Thus, on our recent visit, we had the opportunity of examining some strong and well-made cameras of the tourist form, having all essential movements, and obviously capable of wearing well. A speciality is made by David Allan of what are sometimes termed solid slides—those in which the plate is dropped in from the front, the shutters drawing right out. As this form of slide has always been a favourite with ourselves, we examined the specimen submitted to us with interest. The half-plate size is five-eighths of an inch thick, and the workmanship is faultless.

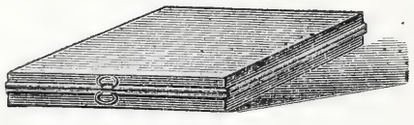
Cheap tripod stands are made a great feature of. A series of three were shown us. The first was a strong two-fold, in polished white wood; the second, a three-fold ash, the bottom leg sliding in, the top being bayonet-jointed; and the third, a four-fold, an extremely light and portable stand, in polished ash, the bottom leg sliding in V-grooves, the top being bayonet-jointed. The latter is a rigid and well-finished stand, and all three are remarkable for their cheapness and excellence of construction. The four-fold measures, when packed up, eighteen inches, and this compactness is obtained by making the two bottom joints of each leg slide independently. For those who require the very greatest portability in stands, one is made in the alpenstock form, suitable for bearing

a hand camera. It is neat and elegant in appearance, and the legs may be clamped together so closely that the stand readily deceives one as to its real nature.

Among dark-room lamps a feature is made of the slope-fronted gas lamp, in which the part of the lamp carrying the window is inclined forward, so that as much of the light as possible is cast in a downward direction; but dark-room lamps in very great variety, ranging from the square-bodied kind, taking a night light, and retailing at eightpence, up to the strong and serviceable japanned lamp for gas that we have just noticed, emanate from Allan's factory in large numbers, and we suspect there is hardly a dealer's establishment without them.

To a special make of printing frame, having the back unequally divided, there is a useful addition in the shape of an indiarubber pad permanently attached to the back. As it is pointed out, this is an essential in platinum printing. Many others of the firm's specialities were brought to our notice, and among them we were immensely struck with the drying box, which is figured in the annexed illustration. The frame of this drier, when not in use, collapses and folds flat. It is covered with fine gauze, which effectually excludes dust and other





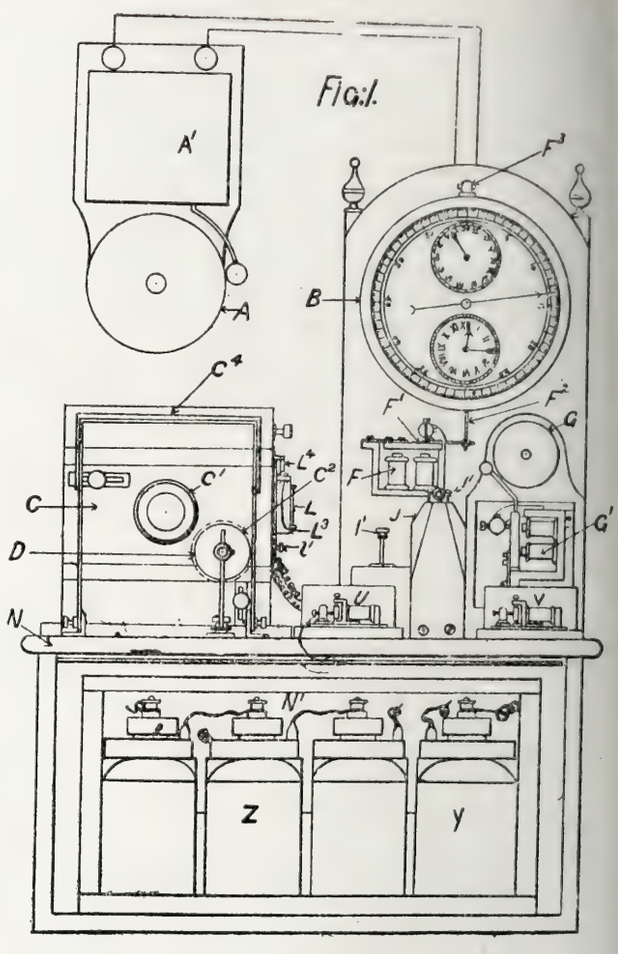
particles. Inside there are two rows of grooving for supporting the plates. It is manifest that plates may thus be dried in the open air, and the operation consequently very greatly accelerated. The drier is beautifully made in japanned metal, and is one of the neatest and handiest photographic devices we have recently encountered.

In its special branches the business of David Allan takes a foremost place, and gives every indication of retaining it. The firm's productions are cheap, good, and useful, and they meet the wants of all photographers. We anticipate continued prosperity for the business under its present able management.

THE DROMOGRAPH.

The above is the title given by Mr. J. Gaut to his invention of an electric photographic recorder, which has been specially devised for recording the time and photographing the finish of a race as well as notifying the start of the race; and, though specially devised for such purposes, it may be used for obtaining a photograph of the time and the position of any athlete or athletes, or moving body or bodies, which are adapted by their movement to break a thin cord or thread. By the invention, the start of a race or contest is announced by the ringing of an electric bell, and at the same time a chronograph is started, and, when the contestants break a cord or thread stretching across the course, or an arena, electrical connexion will be made, which will cause the stoppage of the chronograph and the exposure of a sensitive plate or film behind a camera lens or lenses, so as to photograph the contestants or other objects, and, if desired, to also photograph the reflection of the stopped chronograph.

Referring to the drawings, fig. 1 is a front elevation of the recorder, specially useful for races; fig. 2 is a plan of the same; fig. 3 is a plan of two batteries which, for convenience, form part of the same; fig. 4 is a side elevation from the right-hand side of fig. 1; fig. 5 is a similar view from the left-hand side, showing the camera with its back end elevated as when the recorder is used on an elevation; fig. 6 is a diagrammatic plan view of the electrical connexions used in the recorder; fig. 7, an elevation of the electro magnet and armature for operating the chronograph; fig. 8 is a perspective view of the electro magnet armature and lever for operating the pawl stop of a focal-plane shutter affixed to the camera; fig. 9 is a perspective elevation of the stationary part of the electrical connexion made by the breaking of the thread; fig. 10 is a per-



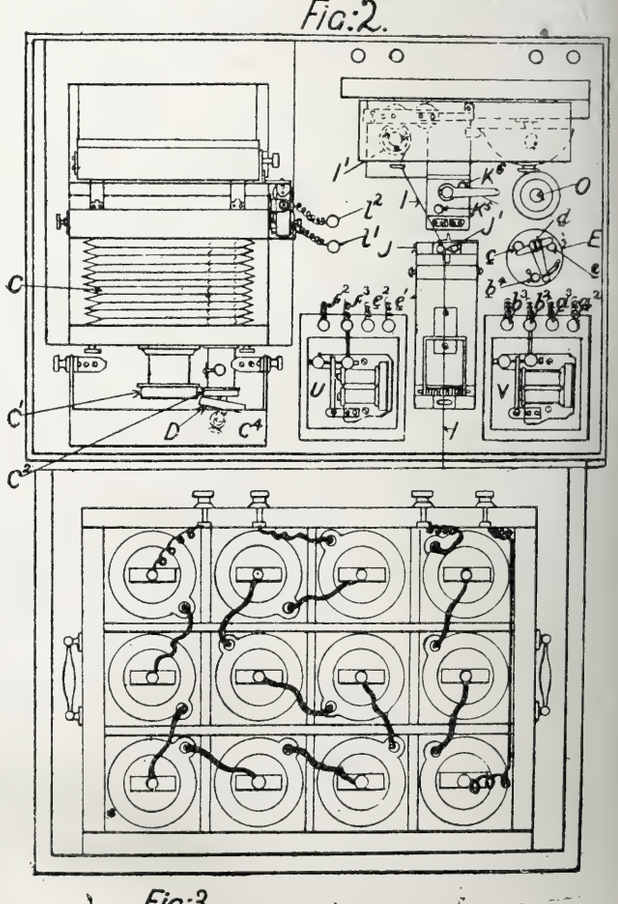


Fig:3.

spective view, showing the moving or active part of the said electrical connexion, and fig. 11 is another perspective view of the same; fig. 12 is a plan view of the operating switch.

The main parts of the recorder are an electric starting bell, A, and a chronograph, B, which are operated at the start of the race; a camera, C, which, preferably, is of peculiar construction, having within the main camera a subsidiary camera with a subsidiary lens, C^2, adapted to throw an image on to one corner of the exposed plate. In front of said subsidiary lens, C^2, is an adjustable mirror, D, so placed as to be fixed as required to throw a reflection of the face of the chronograph, B, into said lens, C^2, which lens is adapted to be focussed from the front. The other main parts are electro magnets, electric batteries, electric wires, and "finish" electrical connexions, adapted to be operated by the breaking of a thread stretched across a racecourse or in an arena at or near the winning or finishing post, and adapted to operate the chronograph stop and the camera shutter. The starting bell is fixed in any convenient position, and may be close to or at any distance from the recorder, and it may have, instead of a battery incorporated with the recorder, as shown,

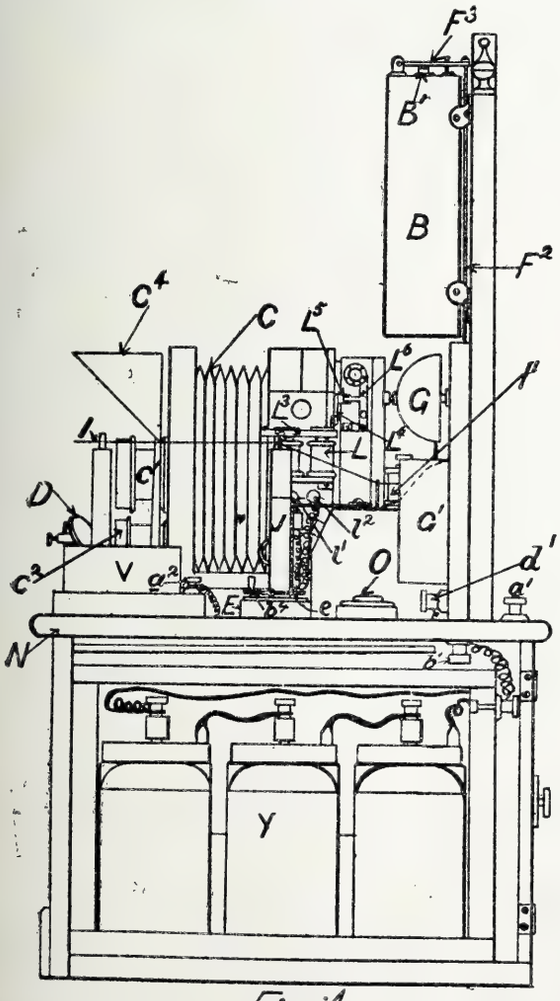


Fig. 4.

an independent battery, or other current-producer, so long as the connexions for closing circuit form part of the recorder. Chronograph, B, is fitted upon an upright part of the frame of the recorder, with its front facing in the same direction as the lens of the camera, C, which camera is fitted upon a baseboard on a frame, N, of convenient height. The lower part of such frame makes a convenient receptacle, N^1, for the batteries. This camera, C, has a back screw, C^3, for elevating the back so that it will take in a lower view, and in front it is provided with a hood or sunshade, C^4, adjustably pinned to the frame, N, so as to preserve the lens from direct sun rays. The camera, C, as before stated, contains within itself a subsidiary camera, having the lens, C^2, said lens and subsidiary camera being so fixed that the image thrown by said lens, C^2, will be full upon a lower corner of the exposed plate, and appear on the upper corner of a positive therefrom. The camera is fitted with an instantaneous or other shutter, preferably a Thornton-Pickard focal-plane shutter, which is operated by means of an electric current, electro magnet, L, being fitted on the side of the camera, and having its armature, L^3, connected with a lever, L^4, having an inturn, L^5, to take under the release lever or pawl, L^6, of the roller of such shutter, so that, upon a current passing through the electro magnet, the inturn, L^5, will lift the

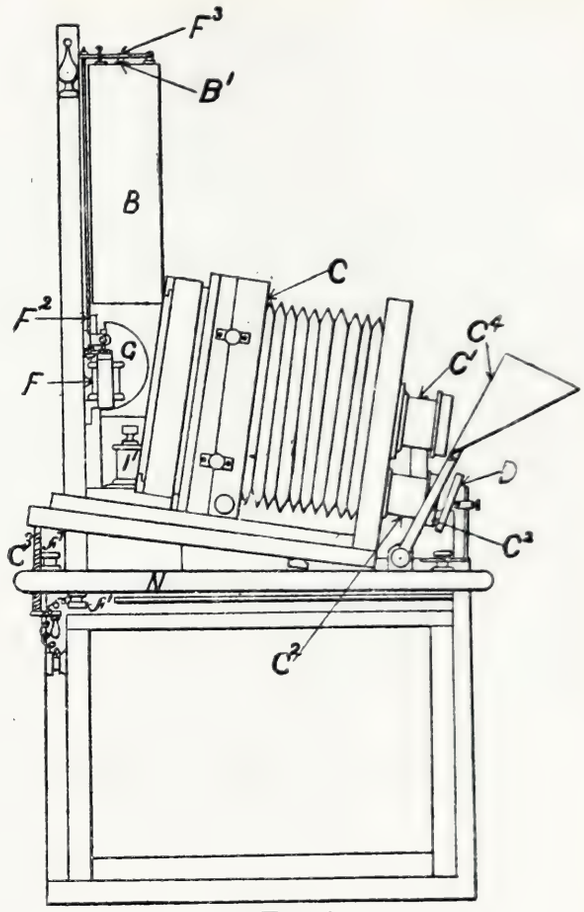


Fig. 5.

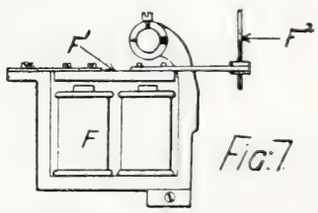


Fig. 7.

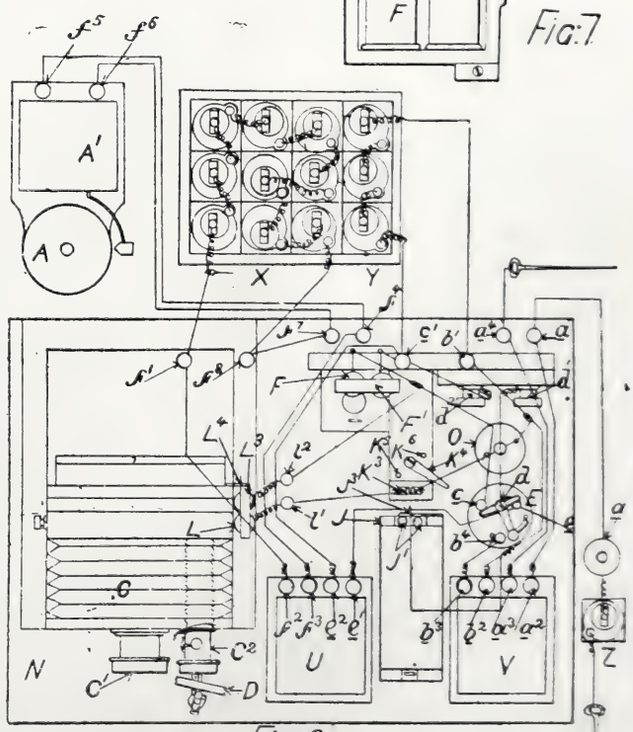


Fig. 6.

pawl, L⁶, from the ratchet of said shutter, and allow the plate in the camera to be exposed. Instead, however, of the pawl, L⁶, being released by an electric current, it may be released in the ordinary way by a pneumatic tube, in which case the bulb of such tube would be contracted by means of the hinged piece, J⁴ (figs. 10 and 11), having a spring, P, assisted, if necessary, by an elastic band, P¹, which hinged piece, J⁴, is supported by another hinge support, J, held in its place by the tension of the cord or thread stretched across the course or arena, and which, when broken, will complete an electric circuit, as hereinafter described, and will allow the hinge flap, J⁴, to contract bulb, J⁵, of the pneumatic tube of the focal-plane shutter. Besides the parts described, there is a second electro-magnetic bell, G, in a convenient place upon the recorder for ringing within the judge's box or other place where the recorder is used. There is an electro magnet, F, for operating the stop pin of the chronograph.

There are also the batteries, X, Y, and Z, switch, E, electrical connexions, J³ and K³, and a push, *a*, while a second push, O, may, if desired, be also used to operate the recorder (instead of the electrical

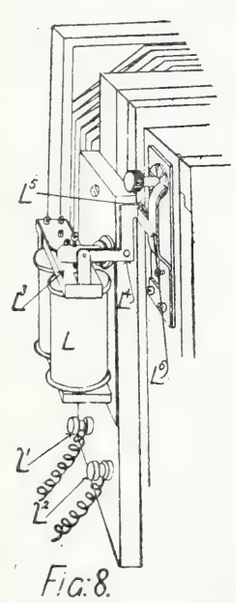


Fig. 8.

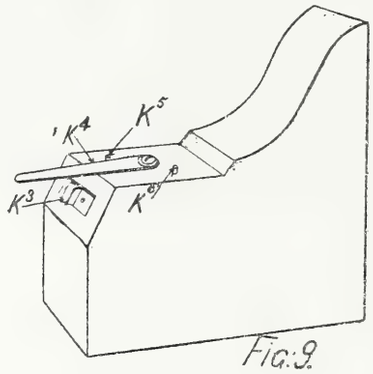


Fig. 9.

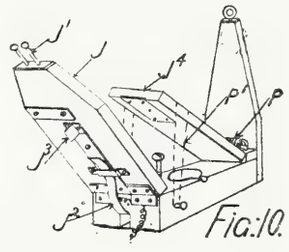


Fig. 10.

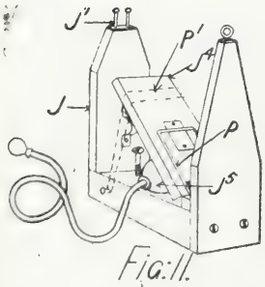


Fig. 11.

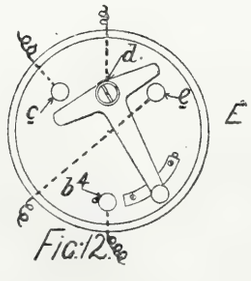


Fig. 12.

connexions, J³ K³), and thread, I, at the finish of a race or the like; and, in addition to these parts, there are also ordinary electric relays, U and V.

A supply cord or thread, I, is maintained for convenience on a spool on a holder, I¹, and this is used stretched across the course or arena, and kept in tension by being fastened to pins, J¹, or connexion, J³.

In operation upon the starting of a race, contact is made by means of push or spring, *a*, attached to any race-starting or like machine, or operated by hand or by the breakage of a thread stretched across the course. Immediately thereon an electric current flows from pole of battery, Z, near the starting point to terminal, a^1, on recorder frame, thence to terminal, a^2, of relay, V, through coils of relay and terminal, a^3, to terminal, a^4, and thence to earth, or by return wire to the other pole of the battery, Z. Contact is thus made in circuit of local battery, Y, the current flowing from pole of said battery, Y, to terminal, b^1, thence to terminal, b^2, of relay, V; thence, through terminal, b^3, to pin, b^4, of switch, E, across lever of said switch, and dividing at pins, *c*, *d*, and *e*. From pin, *c*, one current flows to coils of electro magnet, F, in connexion with chronograph, B, thence to terminal, c^1, and to other pole of battery, Y. The armature, F¹, of the electro magnet, F, is now drawn down, and pulls down rod, F², and causes lever, F³, to depress the stop pin, B¹, of the chronograph, B, thus starting the chronograph, B. The second current flows from pin, *d*, of switch, E, to terminal, d^1, of electro magnet, G¹, of bell, G, through coils of said electro magnet, G¹ and terminal, d^2, to to terminal, c^1, to pole battery, Y, thus operating bell, G. The third current, from pin, *e*, of switch, E, flows to terminal, e^1, of relay, U, through relay and terminal, e^2, to terminal, c^1, and pole of battery, Y. Contact is made through relay, U, in the circuit of battery, X, the current flowing from pole of battery, X, to terminal, f^1, thence to terminal, f^2, of relay, U, to terminal, f^3, to terminal, f^4, thence to terminal, f^5 of electro magnet, A¹, of bell, A, through electro magnet, A¹, to terminal, f^6, terminals, f^7 and f^8, to the other pole of battery, X, thus operating the bell, A. By moving switch, E, from pin, b^4, contact is broken, and thus shutting off the currents from electro magnet, F, of chronograph, B, the armature, F¹, is eased, and the pressure of lever, F³, on starting pin, B¹, is released, while, at the same time, the action or ringing of the bells, G and A, is arrested. The thread, I, stretched across the course or arena at the winning posts or other stations, and tied to, or wound on, pins, J¹, on hinged support, J, holds said hinged support, J, upright against the action of the spring, J². When said thread, I, is broken by the passing of the first competitor, or by other desired movements, the hinged support, J, falls back, causing the chopper terminal, J³, to enter gutter terminal, K³, and thus to complete an electrical circuit of the battery, Y, from between terminals, b^1 and b^2, through terminals, J³ K³, to terminals l^1, of electro magnet, L, through said electro magnet, L, and its other terminals, l^2, to the conductor between electro magnet, F, and terminal, *c*, of switch, E. The armature, L³, of electro magnet, L, being drawn down, the lever, L⁴, lifts the release catch of the instantaneous shutter, allowing said shutter to fall and an exposure to be made simultaneously with the stopping of the chronograph by the action of the armature of electro magnet, F, upon lever, F³. When the recorder is not mechanically connected with the starting post, or a starting machine to operate it, the relay, V, is cut out by having a permanent connexion made between terminals, b^2 and b^3, the arm or lever of switch, E, being drawn away from pin, b^4. Now, when the race starts, said arm of switch, E, is manually returned to pin, b^4, and current then flows from battery, Y, to terminals, b^1, b^2, b^3, pin, b^4, of switch, E, and divides at pins, *c*, *d*, and *e*, in the same manner and with the same result as before described, viz., starting the chronograph and ringing the starting bells. On the switch being drawn back, the bells cease to ring, and the armature of electro magnet, F, is released, as before mentioned. When the thread is not used for operating machine, the electrical connexions, J³ and K³, are not utilised, but the bottom of push, O, is manually operated at the desired moment, thus completing an electrical circuit from battery, Y, from off conductor between terminals, b^1 and b^2, to the push, O, to terminal, K³, to electro magnet, L, and back to wire between pin, *c*, and electro magnet, F, thus opening the shutter of camera, and stopping the chronograph synchronically substantially as before described. On the support for the gutter terminal, K³, is pivoted a guard, K⁴, which is normally against pin, K⁵, so as to bear against hinged support, J, and prevent contact between terminals, J³ and K³, until the thread, I, is fixed in the "ready" position, after which the guard, K⁴, is turned against pin, K⁶, and no longer holds up supports, J, thus allowing contact being made when the thread is broken.

After a stoppage of the chronograph and the dropping of the camera shutter, as before described, the chronograph is "set," or brought to zero by either a slight manual pressure on the top of armature, F¹, or, electrically, by a pressure on push, O.

PHOTOGRAPHIC EXPORTS.

COMPILED FROM THE CUSTOMS ENTRIES.

July, 1897.

	£		£		£
Adelaide	232	Brought forward	1928	Brought forward	4270
Alexandria	12	East London	105	Otago	87
Auckland	147	Flushing	450	Penang	17
Bangkok	20	Freemantle	172	Perth	49
Barbadoes	31	Ghent	98	Port Elizabeth	218
Bilbao	46	Hamburg	19	Rangoon	29
Boulogne	78	Hobart	23	St. John's, N.B.	15
Brisbane	250	Hong Kong	116	St. Petersburg	43
Buenos Ayres	178	Kobé	158	Santander	18
Calcutta	289	Kurrachee	182	Santos	10
Canaries	6	Madras	56	Shanghai	64
Canton	9	Malta	18	Singapore	450
Cape Town	307	Melbourne	815	Sydney	754
Cologne	50	Mossel Bay	11	Timaru	9
Colombo	28	Newcastle	24	Tokio	402
Constant	40	Odessa	66	Trinidad	14
Constantinople	6	Oporto	22	Wellington	248
Durban	199	Ostend	7	Yokohama	643
Carried forward	1928	Carried forward	4270	Total	7340

July, 1896.

delaide	£132	Brought forward	£2389	Brought forward	£4913
msterdam.....	7	East London	50	Newcastle	23
ackland	244	Flushing	918	New York	7
atoum	92	Freemantle	55	Odessa.....	85
ombay	536	Ghent	28	Otago	77
oulogne	163	Gothenburg	64	Port Elizabeth ...	184
risbane.....	23	Hamburg.....	92	Rangoon	60
uenos Ayres.....	258	Hiogo	65	Santos	10
usreh.....	36	Hong Kong.....	43	St. Petersburg ...	95
alcutta	280	Kurrachee	91	Shanghai.....	10
anterbury.....	81	Lisbon	26	Singapore	29
ape Town.....	138	Lyttleton.....	57	Stockholm	39
hristchurch	42	Madras	25	Sydney	754
hristiania.....	14	Malta	48	Tokio	146
olombo	99	Mauritius	16	Trinidad	32
onstantinople ...	38	Melbourne	908	Wellington.....	156
elagoa Bay	87	Monte Video	21	Yokohama	389
urban	119	Nelson.....	17		
Carried forward	£2389	Carried forward	£4913	Total	£7059

Our Editorial Table.

Specimens of Military Photographs.

By F. G. O. Stuart, Southampton.

Mr. Stuart has for many years been noted for the good qualities of his architectural and landscape photographs, and in more recent times he has turned his attention to naval and military work with such success, that there are probably few readers of the illustrated newspapers who are not familiar with his fine and vigorous productions. Before us, as we write, lie several photographs of military subjects, that attest Mr. Stuart's ability to secure the most effective results. Be it remembered that, in photographing soldiers, correctness of attitude and uniform have to be carefully studied, and the definition of the figures must be extremely fine. The series includes portraits of Sir Pertab Singh; a trooper of the 2nd Lifeguards; the Prince of Wales in uniform on horseback; Captain Ames, the tallest man (6 ft. 7½in.) in the British Army; the Queen's escort of the 2nd Lifeguards, and other subjects. The prints are splendid examples of this kind of work, and amply show Mr. Stuart's skill in the selection and lighting of his subjects—indeed there are probably no better photographs of military life extant than those made by him.

The Shakespearean Guide to Stratford-on-Avon.

By H. Snowden Ward and Catherine Weed Ward. London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

This is an excellent and exhaustive guide to the birthplace of the "bard of all time," calculated to be useful alike to the casual visitor, the student, and the enthusiast. A number of phototypes and drawings, a plan of the town, and a map of the district are given, thus enhancing the practical value of the book. The authors have done their work so completely as to map out a number of tours including Stratford. The information throughout is plain and minute, but tersely expressed, and no single object of Shakespearean interest appears to have escaped notice, so that altogether the book is one to take in hand with every confidence that it will form a trustworthy guide to one of the most interesting spots in England.

Photography Annual, 1897.

Edited by Henry Sturmey. London: Iliffe & Son, 3 St. Bride-street, E.C.

Photography Annual comes to us exhibiting the well-known features that have distinguished previous issues. Besides the usual conscientiously compiled statistical information, there is a section devoted to practical articles by various writers, and among these the photographer in search of useful information will find much to repay perusal. Progress in Photographic Chemistry during 1896 is summarised by Mr. Bothamley, and Mr. Chapman Jones treats of Photographic Optics in a similar manner. Mr. Albert Taylor has an able article on Astronomical Photography, but the space devoted to the subject (sixty-two pages) is surely in excess of the needs of the case. The section devoted to apparatus is as exhaustive as ever. Many excellent illustrations are interspersed throughout the book, upon which all concerned in its preparation are to be congratulated.

The Process Year-Book for 1897.

Conducted by William Gamble. London: Penrose & Co., 8 Upper Baker-street, W.C.

The third issue of the *Process Year-Book* is fully equal in interest and excellence to its two predecessors, if, indeed, it does not surpass them. The many examples of half-tone, line, and colour work show at a glance the high level of quality which modern process has reached; indeed, simply as an object-lesson in the achievements of photography as an aid to illustration, the *Process Year-Book* is of inestimable value. Very many well-known magazines and other publications have lent blocks, thus making the collection of pictures representative. Upon the subject of newspaper illustrations the editor has an informative article, and contributions of value appear from many of those who have identified themselves with the progress of process. The *Process Year-Book* is useful and beautiful in about equal proportions, while the printing and get-up are faultless. By its many excellencies it emphasises the marvellous extent to which modern book, newspaper, and magazine illustration relies on photography, and it will do much to increase the obligation. Upon his share of the work in producing the book, Mr. Gamble is to be heartily complimented.

Convention Photographs.

By A. Seaman, Chesterfield.

Mr. Seaman is as thoroughgoing in his support of the Convention as he is of stereoscopic photography, and we have grown to look upon his binocular souvenirs of these pleasant annual photographic reunions as regular visitants. This time he sends us a series of views taken at Norwich, Yarmouth, Oulton, &c. Many well-known faces appear in the photographs, which we shall preserve as mementoes of an agreeable meeting. One of the pictures is an interior view of Norwich Cathedral, and forms a capital subject for viewing in the stereoscope.

The Convention Group.

By F. H. Sayers, 26 King-street, Great Yarmouth.

The assemblage of the Members of the Photographic Convention of the United Kingdom at Yarmouth last month gave Mr. Sayers the opportunity of securing a capital group, which earned general praise. We may inform our readers that copies of the picture, in either gelatino-chloride or platinum, may be obtained of Mr. Sayers at a cost of 3*s*. 6*d*., 3*d*. extra for postage being charged.

The Ilford Special Plates.

The Britannia Works Company, Ilford, E.

The Britannia Works Company write us as follows: "Referring to remarks in your last issue, which assumed that plates of extreme rapidity do not keep for a longer period than three months, we beg to dispute the assumption as regards the Ilford special plates. We do this from the practical experience of years and the indisputable evidence of continual and regular shipments of these ultra-rapid plates to the colonies and abroad, where, in most cases, the plates are three months old or more before they reach their destination. With this we send you a box of Ilford special rapid plates, in original packages, as sent from our works more than twelve months ago, and we shall be glad if you will try them and report the result." We subjected the plates sent us to practical trial in the camera, and, using a developer of metol and carbonate of potash, obtained negatives of perfect clearness, without veil, and entirely free from any signs of deterioration of quality.

The Improved "Platystigmat" Lens.

W. Wray, North Hill, Highgate.

When the Platystigmat lens was introduced nearly two years ago, it was recognised as marking a great advance in construction on pre-existing lenses of the ordinary type, its large angle of covering power and flatness of field well qualifying it to take a prominent place among modern lenses; but it was conceded by the makers that, on account of the limited means at their command, the destruction of the astigmatic error had not been rendered as complete as they could have desired, and this has led to considerable experimental work, with the object of improving the lens in the direction pointed at. The outcome of these experiments is an improved Platystigmat, from which the endeavour has been made to eliminate all traces of astigmatism. We have been given an oppor-

tunity of pitting one of the new lenses against one of the old form of about the same focus. The improvement is very marked, for, excellent as the older lens undoubtedly was, the new one is distinctly its superior in freedom from astigmatism, of which no signs are apparent in the negatives that we took with it. The full aperture of the lens is *f*-8, and at that opening, though it is not listed for the size at a larger aperture than *f*-16, we found that a half-plate was exceedingly well covered. The Platystigmat, in its improved form, is an admirable type of the modern anastigmat, yielding fine definition, with ideal evenness of illumination, and, when slightly stopped down, acting as a wide-angle objective of perfect quality. We may mention that the astigmatism is eliminated by a modification of one of the combinations which can be substituted for one in the older form of Platystigmat, the latter thus being easily corrected for the error at the option of those possessing the lens.

News and Notes.

Mr. James Buncle has removed from 7, Hope-street, Edinburgh, to larger and more convenient premises at 21, Maitland-street, which were opened on July 1. The shop is fitted with electric light, and the various departments are supplied with the latest and most approved apparatus for the carrying on of an increasing business.

Investigations as to responsibility for the fire at the Charity Bazaar have now concluded, and the Juge d'Instruction has sent in three names to the Parquet, or office, of the Public Prosecutor. Two *employés* of the Cinematograph Company and Baron de Mackau are the persons mentioned, and they are charged with homicide by imprudence. Baron de Mackau was the chief organizer and promoter of the bazaar.

Photophil writes: "With reference to Mr. Russell's paper *On the Action Exerted by Certain . . . . Substances on a Photographic Plate* (British Journal of Photography, No. 1943, page 490), it may be worth while to mention the fact, probably well known to many, that gelatino-bromide dry plates left even for a short period in contact with printed pages contract a clear impression of the typography, and the same happens with plates that have been fixed and developed."—*Paris Correspondent.*

Heat-indicating Paint.—At a recent meeting of the Physical Society, Dr. Thomson exhibited specimens of a heat-indicating paint, composed of a double iodide of copper and mercury, originally discovered twenty years ago by a German physicist. At ordinary temperatures the paint is red, but when heated to 97° C. (206° Fahr.) it turns black. Paper painted with this composition and warmed at a stove exhibits the change in the few seconds. A yellow double iodide of silver and mercury is even more sensitive to heat, changing from yellow to dark red at a temperature of 45° C. (113° Fahr.).

One of the principal attractions at the Imperial Institute Yachting and Fisheries Exhibition is the comprehensive exhibit arranged by the town of Lowestoft, illustrating the fishing and other industries connected with that busy seaport on the east coast. With the object of still further drawing attention to the attractions of this flourishing watering-place, the Mayor and Corporation have prepared for gratuitous distribution a well-illustrated souvenir and guide, copies of which, we are informed, may be obtained at the Exhibition, or post free on application to the Town Clerk, Town Hall, Lowestoft.

The Röntgen Rays Applied to Mining.—Dr. F. E. Yoadum, of Los Angeles, California., has applied the X rays to the determination of gold in quartz. The physician was photographing a tumour; there was a vacant space on the plate, and he placed a piece of gold-bearing quartz on it; when the plate was developed the outlines of the rock came out on it, with specks here and there, which showed the presence of gold. Since then he has taken a number of pictures of gold in valuable ore. The fluoroscope has been used for this purpose. It is believed that the discovery will be of use to geologists and mineralogists in prospecting.

Photographing Rail Deflections.—In an article about the technical applications of photography by Herr Wilhelm Müller, in the *Zeitschr. des Oesterr. Ing. u. Arch. Vereines* for February 5, an arrangement is shown for enabling the deflections of rails, bridges, &c., under moving loads, to be photographically recorded. Briefly, says the *Engineering Magazine*, the apparatus consists of a camera, of which the plate-holder is fitted to slide across the back by clockwork, so that a series of successive images may be taken upon one and the same plate at uniform intervals of time. The rail or beam to be observed has attached to it a brilliantly polished bead, which is photographed as a point of light, and the successive images of this point show the deflections. A second lens causes the images of a similar stationary point to be photographed upon the same plate in a line just below, thus furnishing a base line for comparison. The images are so close together that they practically form a continuous line, the deflection images giving an irregular curve showing the movements of the rail, while the spacing of the points upon the base line are clearly enough defined to enable the intervals of time to be noted. It is, of course, essential that such an apparatus should be mounted upon a very solid foundation, as the least vibration of the camera would be fatal to the accuracy of the record; and the objective used must have great light-gathering power, owing to the feebleness of the illumination. The apparatus, as installed in the Nordbahnhofe, in Vienna, is fixed upon a masonry pier, is fitted with a Zeiss anastigmat objective, and has given excellent results in practice.

A small Committee has been appointed by the Treasury "to consider and report upon the desirability of establishing a National Physical Laboratory for the testing and verification of instruments for physical investigation, for the construction and preservation of standards of measurement, and for the systematic determination of physical constants and numerical data useful for scientific and industrial purposes, and to report whether the work of such an institution, if established, could be associated with any testing or standardising work already performed, wholly or partly, at the public cost." The following will be the members of the Committee: The Lord Rayleigh, F.R.S. (Chairman); Sir Courtenay Boyle, K.C.B.; Sir Andrew Noble, K.C.B., F.R.S.; Sir John Wolfe Barry, K.C.B., F.R.S.; Professor W. C. Roberts-Austen, C.B., F.R.S.; Mr. Robert Chalmers (of the Treasury); Professor A. W. Rücker, F.R.S.; Mr. Alexander Siemens; Dr. T. E. Thorpe, F.R.S.

The *Glasgow Evening News* last week contained the following interesting paragraph:—"A stranger struck the city this week who parted with his visiting card somewhat freely. The back of the card contained the following announcement, which we give *verbatim et literatim*:—

"'Royal Photographic Society,
"'12, Hanover-square, London.

"'Fellow Travellers, Ladies, and Gentlemen,

"'As a Photographic Operator on Five Continents, I am often asked to take photographs of fellow-travellers on tour, views, &c., and send high-class finished prints on approval or gratis *by way of amusement;* to avoid any personal explanation, I wish it to be understood I am not a Professional Photographer; but, if friends require Photographs of a high quality, I am willing to oblige, and *take a lively interest in obtaining best results* on condition *out of pocket cost* to cover the completed pictures are prepaid.

"'Very truly yours,
"'____ ____ ____'

"The 'explanation' (*sic*) caused no little amusement amongst those who received it."

One of the leading photographic agents in Paris has given some curious information about the sale of portraits of eminent, notable, or notorious persons. He says what need not surprise anybody, namely, that the photographs of actresses and stage persons generally command the largest sales. Cléo de Mérode, ballet dancer of the Opéra, with her Botticelli-banded hair, holds the record. There is no doubt about that. Her portraits are ordered from all parts of the world, and ten thousand of them leave Paris annually, costing from 2f. to 2f. 50c. Madame Sarah Bernhardt, despite her great fame, her European celebrity and her undoubted gifts, does not attract like this marvellous ballet-dancer, who is really no Terpsichorean star, but only, as her rivals and colleagues say, a *belle femme*. Madame Bernhardt's photographs only attain two-thirds of the figure reached by the dazzling De Mérode. Next follow in comparative order La Belle Otéro, Duvernoy, Réjane, and Jane Hading. Germans, Russians, and Americans are said to be the chief purchasers. The Frenchman, according to old Boileau, does not buy photographs if he can help it. He looks at them on the cheap as they are plastered all over the shop window, or he studies them in the illustrated papers supplied to him with his diurnal refreshments in the cafés and brasseries. Turning to the ugly and generally whiskered sex, it is curious to find that Menelik, Negus of Abyssinia, holds the record for men. He has been brought into remarkable prominence since his victories, and next to him in popularity among photograph-purchasers are the King of Greece and his family, the German Emperor, the Tsar, and President Felix Faure. Of politicians or statesmen M. Hanotaux, Minister for Foreign Affairs, appears to command most attention. He is followed at a distance by M. Méline and by M. Rambaud, but nobody seems to care for the senators and deputies. Of literary celebrities, Pierre Loti, that is to say, Lieutenant Viaud, comes first, chiefly, perhaps, on account of the Arab costume in which he is generally draped in his portraits. After him appears M. Zola, 800 of whose portraits are annually sent out of Paris to different parts of the world. Photographs of Alphonse Daudet, of Gyp, of the Dumas (father and son), of Hugo, George Sand, and Lamartine are always in good, steady request. Occasionally there is a little run on the portraits of the Academicians Halévy, Coppée, Sardou, France, and De Hérédia, and of the painters Jeau Paul Laurens, Benjamin Constant, Détaille, and Rosa Bonheur.

Patent News.

The following applications for Patents were made between July 26 and July 31, 1897:—

Animated Photographs.—No. 17,565. "Improvements in or relating to the Production and Exhibition of the Pictures of Moving Objects." E. Sandow.

Colour Photography.—No. 17,632. "An improvement in Changing Backs for use in Colour-screen Photography." J. Joly.

Copying Apparatus.—No. 17,633. "Improvements in Photographic Copying Apparatus." Complete specification. A. Schwarz.

Copying Apparatus.—No. 17,634. "Improvements in Photographic Copying Apparatus." Complete specification. A. Schwarz.

Cameras and Slides.—No. 17,636. "Improvements in Folding Cameras and in Dark Slides for Cameras." H. Hill and E. G. Price.

Cinematography.—No. 17,735. "Improvements in Apparatus for Photographing and Exhibiting Cinematographic Pictures." L. U. Kamm.

Projection Apparatus.—No. 17,803. "Improvements in Apparatus for Projecting Photographic and other Pictures." E. P. Allam, G. C. Calvert, and J. Fleming.

Bas-relief Photographs.—No. 17,804. "Photo-modelling in Bas-relief." Communicated by A. Gonzalez. H. H. Leigh.

RULING MACHINE.—No. 17,900. "A Machine for Ruling Transparent Plates or Screens for Colour Photographic Purposes." Complete specification. J. JOLY.

CAMERA.—No. 17,935. "An Improved Photographic Camera." G. J. F. M. MATTIOLI.

CHRONO-PHOTOGRAPHY.—No. 18,014. "Improvements in Chrono-photographic Apparatus." Complete specification. A. RATEAU.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
16	Bradford Photo. Society	Results of Annual Excursion.
16	North Middlesex	*Printing.* H. W. Bennett, F.R.P.S.
16	Southland	Humorous Subjects and Copies.
17	Aintree	*Development.* C. F. Inston.
17	Brixton and Clapham	*Hand-camera Work.* W. Thomas.
17	Hackney	*Developers: How to Use them.* J. Wilmer Cole.
18	Photographic Club	Open Night.
19	Bradford Camera Club	*First Steps in Carbon Printing.* Walter Booth.
21	Aintree	Excursion: Rufford. Leader, A. G. Ashley.
21	Hackney	Excursion: Benfleet. Leader, W. A. Hensler.
21	Oldham	Excursion: Agecroft Hall. Leader, T. Widdop.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 5,—Mr. A. Mackie in the chair.

The draft programme for the autumn and winter months was announced as follows:—September 16, *The Queen and the Riviera*, A. L. Henderson; September 30, *Notes on some little-known Developers*, E. Banks; October 7, *Meran, in the Austrian Tyrol*, A. L. Henderson; November 4, subject to be announced, T. E. H. Bullen; November 11, subject to be announced, A. Haddon; December 2, subject to be announced, T. E. Freshwater.

Mr. H. C. Rapson showed some wet-plate lantern slides, some toned with platinum and some with mercuric chloride.

Mr. A. L. HENDERSON asked what was the effect of prolonged toning?

Mr. RAPSON said he had only carried it far enough to just get a tone.

The CHAIRMAN asked if they were fixed with hypo or cyanide?

Mr. RAPSON said cyanide.

Mr. HENDERSON said no one seemed to have found the secret of Messrs. York's slides. There appeared to be some sulphide of ammonium or potassium, but he didn't know the quantities.

The CHAIRMAN recommended the Platinum Company's intensifier as giving a black colour.

Mr. HENDERSON asked if Mr. Rapson had tried nitric acid after toning with gold?

Mr. RAPSON had not.

Mr. HENDERSON said he had saved many a wet-plate transparency by its use.

Mr. RAPSON asked whether chloride of gold would bleach the image?

The CHAIRMAN said it was the old method of bleaching a wet plate.

Mr. BANKS advised the use of ferrous oxalate to get the half-tones back again.

Mr. RAPSON showed some negatives, and referred to an article on backing plates in one of the photographic papers. He never found any difficulty with caramel, nor did he find that it chipped off. He had tried coloured collodion, and the plates he showed had spots of the collodion backing between the film and the glass and on the surface. It was more brittle, and more liable to get on the front of the plate; and he thought collodion much inferior to caramel.

Mr. HENDERSON had developed three dozen collodion-backed plates, and had had no difficulty with them; the collodion stained the film slightly, but he found that it washed out.

Mr. FRESHWATER, with reference to collodion backing, said that some plates he had distinctly showed spots of backing on the surfaces of the plates. He was not sure whether it was there before or after coating. Then, if the plates were carried, he found small particles of the backing got on to the surface, and in developing showed markings, which formed little halos with a dark centre. As to the staining in developing, he could not agree with Mr. Henderson. The plates he referred to were stained considerably, but the colour would not wash out after considerable washing in running water; the margins of the plate were of a quite strong yellow colour.

Mr. HENDERSON remarked, as to removing the collodion backing, a small tuft of cotton-wool and emery powder would remove any part without difficulty, and referred to a letter in THE BRITISH JOURNAL OF PHOTOGRAPHY bearing out his remarks; but as to the other part of the letter to professionals, as regards the unsuitableness of collodion as a backing, it was quite ridiculous. He personally found no difficulty with it, and thought it better than anything tacky.

The SECRETARY said, if the collodion backing were brittle and liable to chip off in carrying, one must be rather careful if particles got on to the surface of the plate.

Mr. RAPSON said that out of two dozen backed plates he had one dozen with spots and halo round them.

The CHAIRMAN said that caramel did not come off in his experience, and he had no trouble with it.

Mr. HENDERSON said he wanted something that was a waterproof backing, and that will keep for, say, six months.

Mr. Henderson showed some transparencies from negatives taken at Dunmow on Monday of the ceremony of presenting the Flitch of Bacon, taken on Paget XXXX plates, with Cooke lens *f*-6·5, in the afternoon, and one plate being exposed on the interior of a tent where the "Court" was held, which spoke for the rapidity of the lens.

Mr. RAPSON also spoke of the rapidity of a Cooke lens on dark subjects.

A question was read from the box: "If an undried negative be placed in a solution of alcohol to which has been added a small quantity of gum resin, will the gum resin permeate the gelatine?"

Mr. BANKS said that gum resin would not permeate the gelatine.

Mr. HENDERSON said a certain amount of gum resin does permeate the gelatine. If a negative had never been dried at all, and put in alcohol, there would be a certain amount of gum resin in the film.

Mr. Haddon showed a print which had reference to the discussion on toning and fixing at the last meeting.

At the last meeting Mr. Henderson referred to the water he used at home from a well, and which he had trouble with. He now brought a bottle of the water up, and asked Mr. Haddon if he could find out what was the matter with it?

North Middlesex Photographic Society.—August 9, Mr. W. D. Williams in the chair.—Mr. Lionel Cape, 77, Alkham-road, Stamford Hill, was nominated for membership. Mr. MATTOCKS and Mr. SMITH gave an account of the outing on Bank Holiday to Rochford. The excursion was enjoyable, but it took about three hours to get there, and no time was available for work before lunch. The light was excellent. About eight members turned up. The Secretary showed some prints on a sepia printing paper, used for engineers' drawings, of which several of the members had obtained samples some while ago. Mr. Treadway showed a negative with a curious band across the plate, which had not developed, although a ship showed against it quite distinctly (the view was of the open sea against the light in early morning). Mr. MacIntosh showed a Dallmeyer triplet lens, and a tube he had had made to take one of the combination, and a collar inside to take spectacle lenses of various foci, which formed a very useful series of lenses for pictorial work. Mr. CROUCH did not think much improvement would result from altering the curvature of the negative lenses.

Rotherham Photographic Society.—August 3, Mr. J. Leadbeater (Vice-President) occupied the chair.—Prints and negatives resulting from the successful excursion to Fountains Abbey, on July 13, were exhibited and criticised. Attention was called to the Members' Competition, the latest date for receiving work being September 30. Mr. HEMMINGWAY (Hon. Secretary) explained the cold-bath platinotype process, and showed the method of working it. While it was the most permanent of printing processes, and stood in the front rank on account of its delicacy of image, the simplicity of the manipulation added to its popularity. The chief difficulty is with the printing, but the proper depth to carry the image was soon learned.

FORTHCOMING EXHIBITIONS.

1897.	
August 31	Royal Cornwall Polytechnic Society, Falmouth. Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 1–Oct. 13	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
December 9–11	Aintree Photographic Society.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

HALATION AND ITS ANTIDOTES.

To the EDITORS.

GENTLEMEN,—In common with many other readers of your JOURNAL, I looked forward to obtaining some information, when I saw a paper under the above heading by Mr. Hector Maclean. Imagine my disappointment, therefore, when I found that Part I. was devoted to a most theoretical consideration of how this troublesome phenomenon *might possibly* be caused, but which, unfortunately, gave no more *real* information than may be found in any text-book. This disappointment was further intensified on reading Part II., which simply consisted in recommending certain multiple-coated plates, anti-halation plates, anti-halation pads, and various backings, each and all of which have appeared in the advertisement columns of your JOURNAL, and of those of the photographic press generally. But unkindest cut of all is the paper, in your last issue, by Mr. G. Watmough Webster, in which he states that the Company who have issued the collodion-backed plates—which Mr. Hector Maclean considers, from *experience* and *information*, to be the most suitable—are going to *relinquish* this form of backing as being *unsuitable*. Thus we live and learn.—I am, yours, &c.,

Croydon, August 9, 1897. J. H. BALDOCK, F.C.S.

ALBUMEN *VERSUS* GELATINE.

To the EDITORS.

GENTLEMEN,—Your article, in the issue of July 30, on *Albumenised Paper*, by such an authority as Mr. W. B. Bolton, is interesting at a time when there appears to be a decided revival of albumen printing amongst professional photographers. During the last twelve months I have readapted the process for portrait work, and I have come to the conclusion, from my present experience and from a comparison of albumen and gelatine prints produced during the last ten years, that albumen holds its own as regards permanency of results. Of course, gelatine paper is always ready, but to the professional this is a small matter and quite equalised by the difference in cost when albumen paper is sensitised on the premises.

A number of gelatine prints, toned in separate and in combined baths, which have been laid on one side for several years, I have recently opened, to find them badly faded in patches; whilst of albumen prints, older, but not more than ten years old, hardly a faded print could be found. Both lots were made under ordinary commercial conditions, and press home upon me the fact that, although gelatine *may* be permanent, it is no more likely to be so than is albumen, and probably, on account of its liability to absorb moisture, it is less likely.

Gelatine suits the amateur, no doubt, but the professionals, in increasing numbers, are returning to their old, "home-sensitised" albumen paper.—I am, yours, &c., C. H. HEWETT.

Catherine-terrace, Gateshead-on-Tyne, August 3, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

THE MAJOR.—Use the back combination, which is the right way.

H. BROWN.—Probably Mr. R. Beckett, 6, The Grove, Hackney. We believe he was photographing in that immediate neighbourhood.

BEVELLED-EDGE GLASSES.—GEO. MARLEY. These may be obtained at any of the photographic warehouses, such as Marion's, Fallowfield's, &c.

W. S.—Assuming equality of foci and working apertures, the depth of definition would theoretically be equal in the two cases mentioned.

INTENSIFICATION.—J. WILLIAMSON. Several formulæ for intensifying negatives are given in the ALMANAC, all of which are good. You cannot do better than refer to them.

J. G. ATTY (Aldeburgh).—We are unable to give the information; you might obtain it of Mr. L. Nievsky, 14, Granesden-road, Shepherd's Bush, W. We do not answer questions through the post.

ENLARGEMENTS.—WALWORTH. It is impossible for us to say the relative proportion of the enlargements now made by the carbon method and the bromide process, but there is no question that the latter largely predominate.

A. H. CADE.—We do not quite understand whether your question has reference to the assumed "inferiority" of daylight to artificial light or not. Kindly supply fuller particulars. The triple condenser is certainly the more efficient.

METHYLATED SPIRIT.—A. SCOTT. The only way to obtain methylated spirit without the mineral naphtha is to procure from the Excise authorities a licence to purchase it. As by the tone of your letter you know how to proceed, we need not say more on that point.

E. D. COOKE.—The addresses are: H. S. Mendelssohn, Pembridge-square, W.; Walery, Regent-street; Van der Weyde, 182, Regent-street; W. J. Byrne, Hill street, Richmond, S.W.; Gunn & Stuart, Richmond, S.W. We do not answer questions through the post.

THOS. BLINKHORN.—Collotype would be best and cheapest. Messrs. Morgan & Kidd; the London Stereoscopic Company; Bemrose, Derby; Waterlow's, and other firms whose advertisements appear in the JOURNAL and the ALMANAC, undertake such work.

TOUR IN BRITTANY.—J. SWEETMAN. No. You may take photographs there to your heart's content without let or hindrance, but you must avoid anything in the shape of fortifications, as in other places, though not quite so rigidly as on the Franco-German and other frontiers.

SPES MEA CHRISTUS.—The question is somewhat vague. The lens can be used in a hand camera; but, as its largest working aperture is *f*-16, it would be somewhat slow for the purpose. We do not know what you mean by "so constructed." Write again, more explicitly, and we will endeavour to help you.

GELATINE.—D. MCANDREW. We gave the formula just as it is given in the foreign journal we quoted from. It is a too common fault in writing formulæ containing gelatine to give a certain weight of gelatine without any reference to the kind necessary. In this case, a moderately hard one, such as is generally used for dry plates, will answer.

GLAZING STUDIO.—J. BROAD. People seeing into the studio may be prevented by glazing the side next the pathway either with ground glass or with fluted glass. Either will be neater in appearance than stippling the surface over with paint, which, in time, becomes yellow, and then stops out a deal of light, and it is also liable to peel off when it gets old.

PRICES.—PROVINCIAL. If you like to put so low a price on your work, there is no law to prevent you, but we think such extremely low prices a suicidal policy. You should bear in mind that a large proportion of the public appraise the quality of work according to what is charged for it, and they may do so in your case, and possibly may be justified in doing so.

RED PRINTS.—T. L. BROOKER & CO. write: "We should be obliged if you could put us in the way of getting the rich red prints —— is showing. If you could manage this in your next issue, we should be very grateful." —We are not familiar with the particular prints named, but we have very little doubt they are by the carbon process, a red tissue being employed.

EMIGRANT.—1. We imagine that "printers, toners, and general assistants" have not much better prospects in the States than here at home. Really clever and artistic operators appear to be in request. 2. Depends entirely upon the ability of the individual. A good man will command somewhat better wages there than here. 3. Chicago; New York. 4. Immaterial.

DEVELOPER.—T. WATTS. As you succeed well with the developer recommended by the makers of the paper, and have failed with all others, why wish to make any change? The developer that suits one make of paper may not be at all suitable for another. If you do not like that particular developer, you had better get a brand of paper that suits the one you prefer.

COPYING DAGUERREOTYPES.—C. MALCOM. Daguerreotypes are very easy to copy if they are in good condition. All that has to be done is to place them in front of the camera, and take care that there is no reflected light from them that reaches the lens. The best way is to illuminate the picture by a strong side light, stopping off all direct front light. Then they are as easy to copy as any other picture.

SILVER SOLUTIONS.—S. J. BALLARD asks: "Will the enamelled ironware which is now so general do for holding the silver bath for sensitising paper?"—Yes, if the enamelled surface be quite perfect. That is, however, rarely the case with the ordinary enamelled ware, and, if there is any flaw in the enamel, the solution would reach the metal and the silver be reduced to the metallic state.

FLASHLIGHT POWDER.—W. BROWNE (Melbourne). This is very dangerous of storage, and we doubt if any shipping agent would undertake its shipment, and we feel no doubt whatever that any insurance company would not insure any cargo, except at very high premiums, if they knew any of the powder was on board. Neither, we imagine, would any captain carry it. Better get the formula, if possible, from the maker of the apparatus, and compound the mixture yourself.

REFERENCE.—JUSTICE asks: "Have I not a right to a reference from my last employer? We had a quarrel, and he discharged me without notice, paying me a week's wages instead of the week's notice. He now declines to give me a reference. Kindly say if I must take proceedings against him for damages in the County Court or in the Police Court?" —It would be no use to attempt proceedings in either Court. An employer is not bound, nor can he be compelled, to give a late *employé* a reference. When he does so, he does it as an act of courtesy, and that only.

GELATINE PAPERS.—PINXTON writes: "Why cannot paper-makers turn their papers out all alike, so that the toning bath that one is used to would do for all brands? I have been using ——'s paper, and that works splendidly with the sulphocyanide bath; but with ——'s I cannot get the same tones unless I use the combined bath."—This is a somewhat curious query to answer. Every maker produces the paper he finds that suits his customers best, and supplies a formula best adapted for toning them. If all manufacturers were to produce the same article, it is pretty clear that it would be unsatisfactory to many, otherwise one worker would not prefer one make and another a different one, as at present. We may add, that we have never met with difficulty in getting any tone we desire with the sulphocyanide bath, when using the paper our correspondent condemns.

LENS.—INQUIRER writes: "Kindly answer the following questions in THE BRITISH JOURNAL OF PHOTOGRAPHY: 1. Which is the best cheap portrait lens, a plano-convex *f*-8, or a meniscus *f*-11? 2. Will either take a full-length cabinet group in a studio in which I can get back twenty feet, provided they are eight and a half inches focus? 3. Would a six-inch focus lens of either class cover a half-plate at, say, *f*-16; and, if so, which would be most useful in a short studio? 4. Do you consider it would be better to have the end of the studio papered, &c., as an ordinary room, with curtains and genuine accessories, in preference to painted background," &c.?—1. Single lenses are not suitable to portrait work in the studio, because, if sharp definition is desired, they will have to be considerably stopped down, when they become slow for portraiture. 2. Yes, if there are not too many figures in the group. 3. Not with good definition. 4. Solid accessories are always preferable to scenic ones.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1946. Vol. XLIV.—AUGUST 20, 1897.

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EX CATHEDRA.

Our attention has been called to the circumstance that, in a recent issue, we gave currency in this column to a quotation which assumed that no extremely rapid plates would keep longer than three months. The Britannia Works Company, Limited, of Ilford, claim that this disability does not apply to their Ilford Special Rapid plates (red label), and, after careful tests and consideration of the samples and facts that they have put before us, we are amply satisfied that they are correct as to the extended keeping qualities of their plates. We have pleasure in giving the same prominence to this disproof as we gave to the original charge which it contradicts.

* * *

Reference to the keeping qualities of very rapid plates leads us briefly to make mention of what considerable observation has taught us is the principal cause of failure with such plates. In the last number of *Photographic Scraps* there is printed a letter from that photographic *rara avis*, the unsuccessful plate-user, who, having been informed of the reason of his failure, verifies the cause, and has the grace to admit his error. He writes: "Acting on your opinions that the plates (Ilford special rapids) sent were simply spoiled by over-exposure, I tried two more with fastest shutter exposure and second smallest stop. I find that in both cases I have successful negatives. I must say that these plates are rapid in the extreme, and I should think that, after my experience of them, *no exposure within reason could be too fast for them.*"

* * *

The writer of the letter we have quoted confirms a fact that is well within the knowledge of those who make a study of the manufacture and manipulation of extremely rapid plates, viz., that over-exposure is the chief cause of failure with such plates. We think we are justified, from careful observation, in the remark that, while, during the last ten years or so, the average speed of very rapid plates has enormously increased, the average duration of exposure, *cæteris paribus*, has not shown a corresponding diminution. Especially in brilliant summer weather, when, oddly enough, according to our information, the demand for extremely rapid plates is at its height amongst amateurs, does it appear difficult for them to realise to what a pitch of sensitiveness modern dry plates have been brought.

* * *

The rapid approach of the Exhibition season gives us the opportunity of reminding our readers that the month of April, 1898, has been fixed for the holding of the Great International Photographic Exhibition at the Crystal Palace, to be organized under the auspices of the Royal Photographic Society. The lines upon which it is intended to hold the Exhibition give promise of a display more complete, representative, and interesting than any photographic exposition that has previously been held. In addition to the loan collections and foreign exhibits, which we understand will form prominent features, the photographic profession and the apparatus-manufacturers are likely to extend an unprecedented amount of support to the Exhibition. It has been realised that the exhibitors themselves, who are the mainstay of any such undertaking, should have a direct share and voice in its management; and so fully has this idea been appreciated, that one-half the Executive Committee has been appointed by professional photographers, apparatus-makers, and the photo-mechanical trade, as their representatives on that Committee

We may therefore regard it as certain that those reasons which have hitherto made it so difficult to obtain a thoroughly representative Exhibition will be absent in the present case. There will be no feeling lurking in the minds of exhibitors that they are being exploited for purposes of profit. The Exhibition is to be run *by* the trade *for* the trade. No profit of any kind will be made by the promoters, and the rent to be charged for space will be as low as can possibly be fixed, having regard to the necessity of covering out-of-pocket expenses. We have every confidence, therefore, that the trade will give a thorough and undivided support to an undertaking that is to be conducted on so satisfactory a basis, and we are pleased to hear that the promises of participation in the Exhibition are already very numerous and influential. The prospectus and application forms will shortly be issued, so that ample time will be allowed for the preparation of exhibits.

* * *

The Crystal Palace has been selected for the purposes of the Exhibition by reason of the fact that it was the only building in or near London at which sufficient space could be obtained, and in which the fullest justice could be done to the interests of professional photographers, apparatus-makers and dealers, and the photo-mechanical industry. Moreover, the Crystal Palace Company have met the promoters of the Exhibition in a sympathetic spirit, and on their part will omit no effort to promote the success of the Exhibition. All the signs point to a resultant display which will worthily illustrate the present position of the various branches of photography. It is an opportunity for which the photographic profession and industry of the United Kingdom has long been waiting and calling, and we shall look to see the Exhibition cordially supported by all those who have the cause of photographic progress at heart.

* * *

The detention of photographs sent in answer to advertisements is a grievance apparently felt in other professions as well as photography. A correspondent writes as follows to our contemporary, *The Stage*: "A custom, 'more honoured in the breach than the observance,' has lately become a vexed question, namely, to meet the demand of advertising managers, who make it a *sine-quâ-non* that all applicants for engagements—even to baggage men—shall furnish a recent photograph. The expense to provincial artists—whose salaries are not extravagantly large—is not an inconsiderable item, for, in addition to the photograph, there is the cost of double postage. The least thing a manager can do is to return the photographs when stamped and directed envelopes are enclosed for the purpose. Recently I sent a photograph to a country magnate, who owns a theatre, complying with the above-named rule. At the expiration of a month I wrote again, requesting the return of the photograph. No reply. Courtesy does not cost much when stamps are sent for an answer. In my humble opinion such conduct is not only ungentlemanly, but illegal. I sent a photograph at a manager's request with stamp for its return. The photograph is my property, stamp included, and the detention looks very much like obtaining property under false pretences." There appears to be something like a bond of sympathy between some professional photographers and some theatrical managers, as exemplified by a common neglect to return photographs sent. On the other hand, as we have often pointed out, the gross carelessness of those submitting photographs in separate packages which cannot be identified is frequently responsible for the detention of pictures that a photographer would be only too pleased to be without. It is not possible to offer those in the position of the above-quoted correspondent much comfort in the way of advice unless in cases where it is suspected that the photographs are kept for the purposes of being made unauthorised use of. The name and address of the original, boldly inscribed across the print, usually prevents this.

* * *

We have announced more than once that Messrs. E. & H. T. Anthony & Co., of New York, had taken up the Dansac-Chassagne process for exploitation in the United States, and had advertised that the colouring solutions would be commercially available on July 1. According to our American exchanges no progress had been made with the process up to July 12, as the following letter addressed to the Photographers' Association of America, assembled in Convention at Chautauqua, will show.

"*New York, July* 12, 1897.

"To the Photographers' Association of America:

"In regard to the Radiotint materials so recently advertised by us, we regret to say that a large consignment of photographs coloured by the Chassagne method, which Mr. Chassagne promised to send us for exhibition at the Photographers' Association of America Convention, has not yet been received, nor have we received any of the liquids except in experimental quantities, as we did not wish to order a quantity shipped until we were sure that the agitation of the liquids by the ocean voyage would not affect their quality. *Two different sample lots of these liquids were received by us, and we were unable to obtain satisfactory results with them, and therefore cabled to have one of Mr. Chassagne's demonstrators come over and see whether the trouble lay with us or with the liquids. This demonstrator has arrived, but has been unable so far to produce satisfactory results. Just why this is, it is impossible to state as yet. Consequently there will be no demonstration of the process at the Convention.* As soon as satisfactory results can be obtained on this side of the water, due announcement of same will be sent to those interested.—Very truly yours,

"E. & H. T. Anthony & Co."

The italics of the above-quoted letter are ours. We are sorry that Messrs. Anthony should have been disappointed, but we are not surprised at the result of their enterprise. However, possibly by the next mail we shall learn that an operator, having sufficient skill required to produce satisfactory results, has arrived in New York, and that our American brethren have had an opportunity of forming an opinion upon this wonderful process. Be that as it may, we suppose we shall hear no more of the entirely discredited theory that selective absorption has anything to do with the production of the coloured photographs, and we must express surprise that those who originally advanced the theory have not seen enough to convince them that it is no longer worth a moment's serious consideration.

THE SPEED OF PLATES: MESSRS. HURTER & DRIFFIELD'S THEORY PRACTICALLY TESTED.

III.

In a paper on *The Principles involved in Enlarging*,* published in our columns in 1894, Mr. Driffield pointed out the essential conditions in connexion with enlargements on bromide paper.

* The British Journal of Photography, vol. 41, pp. 714, 724.

These are (1) the quality of the negative required, and (2) the estimation of the correct exposure. The consideration which determines the character of the negative is the range of gradation which bromide paper is capable of yielding. The range of gradation of the negative must coincide with the range of gradation of the paper. The range of the paper is defined as the ratio existing between the two exposures, one of which just falls short of producing any deposit, and the other which just suffices to produce the deepest black, viewed by reflected light. Whatever this range may be, the capacity of the negative for transmitting light must have the same ratio. These principles are an obvious development of that branch of the Hurter & Driffield theory which lays it down that the characteristic curve of a plate indicates its properties for a particular class of work.

Obviously, if the principles here mentioned were availed of in practice, it would lead to the production of negatives for enlarging purposes having opacity ratios proportionate to the range of gradation of the particular bromide paper employed. But it hardly needs pointing out that negatives ordinarily produced, in all probability, do not possess the required range of gradation. Premising that the range of gradation of the bromide paper is ascertained by means partly analogous to that employed for ascertaining the density gradations of a glass plate, we come to the supposititious case of the negative which may be suitable for contact printing, and from which it is desired to produce an enlargement. Its range of gradation, however, is unsuitable for bromide paper. What course is to be followed? Mr. Driffield replies: "We must make reproduced negatives having the density range required. . . . . I will indicate my own method of procedure. I first of all produce by means of the camera a transparency on a slow lantern plate, having all the qualities of a good lantern slide. From this, again, also by means of the camera, a new negative is made on a similar slow plate." An ample exposure and the stoppage of development early are the chief essentials in procuring a negative with the narrow range combined with adequate detail for enlarging purposes. The range of the negative for this purpose is the expression of the difference between its highest and lowest densities, and it is found that the density range should not exceed 1:5, while an even more contracted range is preferable, as favouring the production of half-tones.

The value of this part of Messrs. Hurter & Driffield's work has hitherto escaped notice, but it will at once be seen how forcibly it appeals to photographers who produce bromide enlargements. Knowing the density range of the negative (which is easily ascertained by photometric measurement) and the range of the bromide paper, falsity of rendering in prints of this nature need not be tolerated.

We have referred to the gradation range of the bromide paper. One of the experiments Mr. Driffield kindly undertook was the production of a perfect contact print on unknown bromide paper. A negative was selected which had the correct range of opacities, and the following factors entered into the calculation of the exposure: (*a*) the maximum density of the negative, and (*b*) the exposure, which produced the first decisive evidence of deposit on the bromide paper. The source of light used was a paraffin lamp, which had been made equal in visual intensity to twenty candles at a distance of one metre. The same data, of course, come into force as in the case of an enlargement, with this exception, that a given visual density has different printing values in the two cases.

The exposure to be given was arrived at in the following manner: A series of exposures to standardised lamp light was made, the gradations being produced by a revolving disc. The exposure having been made, development of the strips showed that the first decisive sign of deposit was produced by an exposure to a light visually equal to 8 cm. The exposure was thus calculated out:—

$$(2{\cdot}755 \times 0{\cdot}8) + \log.\ 8 = \log.\ \text{exposure}.$$

The log. of the exposure thus calculated is 3·107, the corresponding number to which is 1280, this value being in cm. As the lamp used was equal to twenty candles, the actual exposure given was—

$$\frac{1280}{20} = 64 \text{ seconds}.$$

In the above calculation 2·755 is the maximum density of the negative, and the factor 0·8 is used, for reasons elsewhere given, to convert the visual density into the contact printing density. Log. 8 is the log. of the exposure which produced the first decisive deposit on the bromide paper.

The exposure having been made, the print, upon development, was found to have been correctly exposed.

Mr. Driffield next produced a transparency upon one of the plates, A, we had provided, a point in the characteristic curve corresponding with an exposure of 0·37 cm. supplying a factor in the calculation of the exposure to be given instead of the first evidence of deposit, as in the case of the bromide print. The negative used was the same as in the last experiment, but the light employed was a standard candle at a distance of one metre. The calculation of the exposure was as follows:—

$$(2{\cdot}755 \times 0{\cdot}8) + \log.\ 0{\cdot}37 = \log.\ \text{exposure}.$$

The number corresponding to the answer is 59, and, this exposure in cm. having been given, the result proved perfectly satisfactory.

A further experiment, the most crucial of all, as most forcibly demonstrating the control which the Hurter & Driffield system permits the photographer to exercise over the materials he employs, was as follows: A plate having three bands of deposited silver upon it of widely varying densities was shown us. The problem was to calculate three exposures which, upon development, should yield three positives of uniform density. The densities of the three bands having been measured, the necessary calculations were made, and the three exposures given were 25½, 120, and 388 cm. respectively. The developed results were so visually alike that no difference in the deposits was perceptible. The similarity of the deposits was further confirmed by photometric measurements. Probably this experiment, more than any other, establishes the truth of the theories upon which the Hurter & Driffield system is based.

We might, in conclusion, add that the work of Messrs. Hurter & Driffield is by no means finished. Investigations have been undertaken with the objects of accurately controlling the development factor and bearing upon the influence of fog produced by chemical means, as well as by the action of light. These investigations will be made public at an early date. The entire series of researches will, the authors hope, ultimately be published in book form.

In confining ourselves to the practical aspect of their work, we do not lose sight of the fact, admitted by Messrs. Hurter & Driffield, that to the professional man, working day by day under settled conditions—or what amounts to it—of light, subject, plate sensitiveness, and constancy of development, a theoretical knowledge of the speed of his plates may, to a

large extent, be superfluous; but there are vast numbers of cases in which, without that knowledge, exposures that are made are very largely of a hap-hazard character. One of the main results of an intelligent appreciation of Messrs. Hurter & Driffield's work would be to remove that element from photography and to make certain what is so largely now a matter of guesswork.

The more scientific side of the matter is perhaps not its least important feature. To be able to arrive at what the speed of a plate really is, and to plot off its characteristic qualities, should prove of immense service to the plate-maker, and in this regard alone the value of Messrs. Hurter & Driffield's labours is undoubtedly greater than they have so far been recognised to be. Many causes have conspired to retard that recognition, and not the least of them is the unfortunate confusion which has arisen in the marking of plate boxes with speed numbers of a misleading character. For this state of things, however, Messrs. Hurter & Driffield are not responsible.

As a final word, we may state that we took a perfectly open mind with us in following Mr. Driffield's experiments and explanation. The work of that gentleman and his colleague has long withstood the attacks of theory; in practice, as we endeavoured to show, it supplies evidential proof of its accuracy and value. We do not doubt that in course of time it will receive wider appreciation and recognition than it at present enjoys.

THE SWING BACK IN COPYING.

When we last wrote on the swing back, we dealt with the methods of correcting the various forms of distortion that result in photographs taken with a tilted camera, and, though we showed that it is quite possible to restore such distorted pictures to absolute accuracy, we left the matter in a somewhat indefinite condition, as we had not then formulated any practical plan for arriving at the proper position the original and the copy should occupy in order to attain the desired result. We make no apology for returning to the subject, as, since our last article, we have reduced matters to so simple a form that there is not the least difficulty in dealing with any existing photograph, although there may be no more data available than the distortion present; and it is possible in the future that, when architectural photographs are taken chiefly for reproduction on a different scale, as for lantern slides or enlargements, not only will the photographer be independent of the swing back, but he will produce absolutely better results without its aid.

The letter of Mr. W. H. Wheeler a fortnight ago is interesting as indicating the cause of the apparent anomaly between the effects of swinging the back of the camera when taking the negative, and inclining the sensitive paper or surface when copying from it. We were under the impression, as we intended, that we had pointed this out, or, at least, that the difference in the result produced when copying to the same scale was that, in using the swing back, that alone acted, while, in copying, the intervention of the lens had to be considered as well as the amount of swing or inclination. The method of correction recommended by Mr. Wheeler is as simple as could be, but, we are afraid, of very little use in the majority of cases in actual practice, even though an unlimited "battery" of lenses were available. As a rule, if not invariably, architectural photographs are produced by means of more or less "wide-angle" lenses, and, if for a 10 × 8 plate the by no means unusually short focus of six inches be used, it would be obviously impossible to reproduce the negative the same size *with a three-inch focus lens.*

We referred in our last article to a formula we gave two years ago for ascertaining the correct angles of inclination for original and copy in correcting convergence, but this formula was calculated purely with a view of securing perfect sharpness without reference at all to the distortion produced by the inclination. It occurred to us to try this formula upon the distorted chessboard diagram already referred to, as we feel sure the result could not be far from accuracy, as, both original and copy being inclined, it must in any case be better than if either alone had all the inclination. But, on applying it, we were surprised to find that it worked out with absolute accuracy in every respect, not only with regard to convergence of lines, but also correctness of proportions. Here, then, is the solution of the difficulty, and, though, as we shall show, no calculation is absolutely necessary in practice, we may briefly show the principle on which the matter rests, and then leave it for our readers to judge whether an operation that has been considered one of great difficulty and complexity is not in reality nearly as easy and simple as ordinary copying.

Let us just recapitulate the details of the formula. The first step is to measure the amount of enlargement required by the top of a building in order to bring it to the same dimensions as the base and to render the sides parallel. It is of no use measuring the angle at which the sides are inclined, as this angle varies at every point except the centre of the plate; but *at any part of the plate measured from the centre the difference between the top and base will be proportional.* Thus, if two sloping lines, one at the extreme margin of the plate and the other midway between it and the centre, be measured at the top and bottom, the *difference* between the top and bottom measurements will be proportionately the same in both cases, although the marginal line has twice the slope of the other. In other words, if, on a twelve-inch plate, two lines respectively two and a half and five inches distant from the top centre be chosen, if the former were found to measure at the base two and five-eighths, the latter would be five and a quarter—in both cases one-twentieth larger.

This, then, is the basis of measurement, and, though it may not be possible to find a converging line reaching from top to bottom of a negative, it is easy, by means of a straight edge, to continue one for purposes of measurement to any convenient length from six or eight inches. Having found the proportionate difference—in the above instance one-twentieth—we have to enlarge the top of the picture, or, what amounts to the same thing, reduce the bottom—one-twentieth, in order to restore the perpendicular. For this purpose we calculate, by the rules of conjugate foci, the distance at which, with a lens of given focus, the top portion of the picture must be approached to the lens, and the same portion of the copy removed from it in order to give that degree of enlargement. The bottom portions of each having to remain the same size will each be distant from the lens twice its focus.

However, let us carry out the experiment on the chessboard diagram. On measurement we find the top and bottom stand to one another in the proportion of 23 : 25 as nearly as can be measured, and the height of the diagram is $3\frac{13}{16}$ inches. We have to enlarge the upper portion, therefore, to $1\frac{2}{23}$, or $\frac{25}{23}$ its present size. Calculating by the rule on which our tables of enlargements are framed, and for an $8\frac{1}{2}$-inch-focus lens, we find that the longer conjugate focus

should be $17\frac{17}{23}$ inches, and the shorter $16\frac{8}{25}$. Taking a large sheet of paper, we rule a horizontal line to represent the axis of the lens, and mark it with a centre point to indicate the lens itself or its optical centre. Now, to the left and right, set off the different conjugate focal lengths; to the left 17 inches, and $16\frac{8}{25}$ and to the right 17 inches and $17\frac{17}{23}$, and draw perpendicular lines through the points crossing the axis of the lens.

Next, with the dividers, mark off on a strip of paper the exact length of the diagram $3\frac{13}{16}$ with a point to indicate the exact centre, and, with this point on the axis of the lens, lay the strip of paper so that the terminal points fall respectively on the two uprights representing the focal distances. Draw a line joining the two points, and this will represent the position to be occupied by the diagram to be copied. The other position can be arrived at in the same manner *if we know the length the reproduction ought to be*, which in the ordinary course of events we do not; but it is still more easily arrived at by drawing lines, from the extremities of the sloping one just found, through the centre of the lens, until they cut the focal distances on the other side, and by joining the points of intersection we get the position of the sensitive surface. If the compasses be applied to this last line, it will be found to measure exactly four inches.

On measuring the angles, they are found to be *exactly the same*, for, though the two focal distances on the right are a trifle further apart than those on the left, the increased distance between the intersecting points makes the angles equal, and in this case we find it to be 11°. The diagram was made with the camera tilted, as we believe, at an angle of $12\frac{1}{2}$°, but it strikes us as possible that we may have measured carelessly, and that the proper angle of inclination for correction is equal to that of the tilt applied to both original and copy. We are the more inclined to believe this because, as Mr. Wheeler points out, a lens of half the focal length when copying the same size corrects the distortion produced by the tilt, and the angle has a direct relation to the focal length, as may be shown by repeating the diagram for lenses of different focus.

There is one other point that a study of these diagrams will make clear, namely, that the angles of inclination are precisely the same for any degree of enlargement or reduction by the same lens from the same negative. Alteration of the focus of the lens varies the angle—the shorter the focus the less the inclination—and alteration in the tilt of the camera necessarily does so, but otherwise there is no more trouble involved in the process of correction than in ordinary copying.

It may be said that all this calculation and diagram-making means trouble, but it is not necessary except to explain the principle. The calculation will certainly give the position of the original, from which the proper position of the sensitive surface is got without trouble in focussing, all that is required being to get the focus and the uprights parallel; or, without calculation at all, the original may be inclined until the lines are fairly perpendicular, and then part of the inclination given to the focussing glass, the two being gradually altered until the proper position is obtained. If a note be made at the time of exposure of the degree of tilt, there will not be much wrong with the final result if the same inclination be given to both negative and copy, the same lens being used, or proportionately more or less if a longer or shorter focus be employed.

For taking the angle of the camera, a very simple appliance consists of a short metal "plumb," like that known as the Thornton-Pickard, supplemented by a small protractor let into the body of the camera. This is a very easy and simple addition, while, for those who wish to go in systematically for "boycotting" the swing back (out of doors, at any rate), it would not be difficult to devise a copying arrangement, in which the copy board and focussing glass are connected, so as to swing symmetrically and in unison. Then no calculation or bother would be involved at all, but simply, after getting the focus, a movement of the focussing glass, by which also the negative would be adjusted, until the lines were parallel and *voilà tout!*

We have a strong feeling that the future of architectural photography, especially interiors, lies in the direction of small plates, modern lenses of wide aperture with critical sharpness, *used at their best*, that is, by tilting the camera instead of calling into use the swing back. In this manner, not only is rapidity of exposure promoted, but the finest possible definition secured with perfect freedom from distortion.

Sundays at the Tate Gallery.—It is officially notified that the Tate Gallery, Millbank, being now a branch of the National Gallery, Trafalgar-square, will be open on Sundays the same as that institution, and for the first time next Sunday, August 22, from two till six o'clock.

Art at the East-end.—The East London Art Exhibition, at the People's Palace, will be closed at the end of this month. Those who intend visiting the show should keep the fact in mind. This Exhibition, like all art exhibitions at the East-end, has been very popular. It is to be followed, early in October, by a Trades and Inventions Exhibition, which is intended to be one of actual utility to the artisan classes. Gold, silver, and bronze medals are to be awarded, and the executive committee are making every effort to make the undertaking a success.

The Metric System.—A little while back we mentioned that the Bill for legalising the use of the metric system in Great Britain had been read a second time, and passed through committee in the House of Lords. On the day Parliament was prorogued the Royal assent was given to the Act, which now becomes law. This Act only makes the system legal, it in no way makes it compulsory, and, until it is made so by law, there is very little prospect of its becoming universal in this country. More is the pity, so far as photographic formulæ are concerned.

The Balloon Polar Expedition.—Notwithstanding the different rumours that have appeared in the daily press during the past week, to the effect that pigeons have been captured that were supposed to be some of those taken by Andrée, and that one or more balloons have been sighted in the northern districts, we are, up to the time of writing, without any reliable information about the expedition. M. de Fonvielle, writing in the *Aerophile*, speaks of the sextant and photographic instruments in the possession of the explorers which would enable them to determine exactly their whereabouts, and to obtain most numerous and authentic pictures of the country. After speculating on the possibility of the balloon passing exactly over the pole, the writer adds, "All that is desirable is that the pole should be the region visited by the explorers, and that photographs of it should be taken." In his communication, M. de Fonvielle says that the explorers may have to terminate the expedition with a long march as Nansen did, in which case they may not be heard of till the end of next summer. If this should be the case, it will be doubtful if good photographs of the pole or its

immediate vicinity will be forthcoming. But, after all, this is only mere speculation on the part of the writer, who is an enthusiastic balloonist.

Proposed Extension of Hampstead Heath.—A movement is on foot, and a local committee has been formed, to secure, if possible, for the public, as an addition to the Heath, the beautiful estate of the late Sir T. Spencer Wells, or, at least, about twenty acres of it, on which the preservation of the views countrywards from the summit of the Heath so much depends. The estate is now in the market for building purposes. It is sincerely to be hoped that the movement will be crowned with success. Modern buildings on the fringe of the Heath certainly cannot add to its beauty.

By the way, some little excitement has been caused at Hampstead by its becoming known that there are two or more schemes afloat for the destruction of the fine old street of early eighteenth-century architecture, known as Church-row. The object contemplated is said to be to erect "high-class flats" or mansions on the site. It will be a pity to demolish these fine old buildings, but clearly owners can do as they like with their property.

Twickenham, too, or the more artistic portion of its inhabitants, are in a state of irritation from the fact that a wall that the Duke of Orleans is putting up on his estate will block out the beautiful river view formerly seen from the roadway. A protest has been organized, in which a number of well-known artists have promised support—with what result remains to be seen.

Price of Silver—Lower still.—A fortnight back we called attention to the then exceeding low price of metallic silver, and mentioned that it had beaten all previous records—the quotation was $26\frac{3}{8}d.$ per ounce. Since then the price has still further declined, and the metal has this week been quoted at $25d.$—six farthings less—once more breaking the record. This extraordinary low price of silver, though a boon to plate-makers and the manufacturers and sensitisers of papers, is of no advantage to photographers, except the few who use albumen paper and sensitise it themselves. To the majority it is a positive disadvantage, as they get proportionately so much less for their residues. The price quoted is the market price—that is, what the refiners sell the silver for, and, of course, they cannot allow that sum for what is obtained from the wastes, as they must have a profit. The question is often put as to whether it is worth the amateur's while to save his wastes. At the present price of the metal, and the small amount of silver there is in plates and papers, it is more than doubtful, unless the consumption is greater than it is with the general run of amateurs.

Dangerous Volatile Liquids.—Since that unfortunate lady lost her life at a fashionable hairdresser's at the West-end, through the ignition of the vapour from the petroleum spirit with which she was having her hair dressed, the London Council has woke up to its responsibilities in this direction. Several other hairdressers have been summoned and fined, for keeping the spirit in such a way as to contravene the law. Some appeared to be quite unaware of the properties of the spirit and its dangerous nature, so much so that it is quite surprising that serious accidents have not happened before; but this material is not more dangerous than some others that are often used by persons who are quite ignorant of their properties—ether to wit—and the calamity with the cinematograph in Paris is a case in point, and for which the operators are now awaiting trial for their want of care—perhaps ignorance. Accidents with saturators have occurred here, but they have been due not to the saturators themselves, but to those who used them not understanding the properties of the dangerous materials with which they were dealing.

HISTORICAL PHOTOGRAPHS IN THE PHOTOGRAPHIC SE(TION OF THE IMPERIAL VICTORIAN EXHIBITION AT TH CRYSTAL PALACE.

II.

Last week it was mentioned that the publication of the Daguerreoty process only antedated that of the calotype, or Talbotype, process of t late Mr. Henry Fox Talbot by less than a month. The former name w generally applied to the negatives, and the latter to prints made fro them, though the first name given to the process was "photogen drawing." It is a somewhat curious circumstance that two processe which were destined to lead to such important developments, should bo have been published within three weeks of each other; but such is t fact, Daguerre published his on January 7, and Talbot his on January 3 1839. It is also noteworthy that the two processes were so wide different from each other. Pictures by the former process were on met plates, reversed as regards right and left, but correct to nature in t lights and shadows. Talbot's pictures were on paper, and reversed as the lights and shadows. They were negatives, in fact, from which a number of prints could be made, which, of course, were non-reverse and with correct lights and shades. That was a great advantage—f each Daguerreotype had to be made direct in the camera.

At the end of the court hang, as posts of honour, Nos. 1 and enlarged portraits of the two inventors; that of Daguerre, lent by M Wm. Lang, and that of Fox Talbot lent by his son, Mr. C. H. Talbo On the same screen are also a number of portraits of the pioneers photography—Niépce de St. Victor, Becquerel, Hunt, Sir John Hersche Sir David Brewster, Hardwich, Sayce, Bolton, Dr. Maddox, Woodbur and others. Mr. C. H. Talbot has lent some of his late father's ear work (Nos. 233–6), dated 1844, and as these prints seem to be origin ones, made at that time, a very good idea may be formed of the stabili of pictures made by the process, also what an amateur accomplish more than half a century ago. There are, however, in the Exhibitio prints by the same process that antedate these some few years.

Mr. R. C. Murray has a frame (No. 6) of very early prints fro calotype negatives, portraits (1846–48) taken by Hennemann, who that time had a studio at Regent-street. These early pictures, thoug considerably faded, are of special interest, as they are portraits of tho who were at that time associated with photography—Sir David Brewste A. Claudet, Warren de la Rue, T. Ross, R. W. Thomas, and others, wh have joined the great majority. Mr. A. J. Taylor has lent (No. 2 an early Talbotype, which is interesting, as it formed a supplement the *Art Journal* in 1846. Evidently the *Art Journal* was not then abo photography. A frame (No. 207) from paper negatives, by F. Sco Archer, lent by Mr. Alfred A. Fisk, are interesting as examples of Archer work before he invented the collodion process. The above examples early paper work are all prints from the negatives, but on a screen a shown, by transmitted light, paper negatives, both by the calotype a by the "wax-paper" processes.

It will be well here just to explain, briefly, the two processes, becau some recent writers seem to have confounded them as being one and t same. Probably this confusion in their minds has arisen from the f that the paper in both processes has been rendered translucent waxing.

The calotype—which, by the way, the Crystal Palace printers of t catalogue call "colotype"—is shortly this: Paper—that generally pr ferred was Turner's Chafford Mill—was iodised with iodide of silver, b first treating it with a solution of nitrate of silver and afterwards wit one of iodide of potassium. Next the paper was floated on water remove the nitrate of potash formed, and excess of iodide of potassium, any. The paper was then dried and could then be kept any length of tim For use it had to be sensitised. That was done with gallo-nitrate silver. Two stock solutions were kept, one of nitrate of silver and acet acid, and the other of gallic acid. They were added together as require for use, as they would not keep when mixed. The usual way of applyin the sensitising solution was to pour it on to a levelled plate of glass, an then float the paper upon it. The paper was then washed in distille water to remove the excess of gallo-nitrate, and then blotted off. It w exposed while still moist between two glass plates, which served the du purpose of retaining it moist and keeping it flat in the dark slide. Th paper would not keep more than a day or so after sensitising. Th sensitiveness of the calotype process could be enhanced by usin stronger solutions of the gallo-nitrate and exposing the paper imme diately after it is sensitised, for the more sensitive the paper was th shorter was the time it would keep good. In a fair light, in the studi a portrait could be taken with the Petzval lens in from twenty seconds t a minute. The developer was the same as the sensitising solutio

xcept that it contained somewhat less silver. If the paper was kept ng between exposure and development, the image would become visible, wing to the developing action of the gallic acid. The negatives were xed with hyposulphite of soda and then well washed. They were ien rendered translucent by waxing. Such was the calotype process.

Here is the "wax-paper" process. In the collotype process the last peration was the waxing of the paper; in the wax-paper process it is he first. The paper was evenly saturated with beeswax. It was then odised by soaking it for an hour or more in the iodising solution, which vas composed of iodides, bromides, chlorides, &c., and usually some rganic matter, such as sugar of milk for example, and a little free odine. A stock of this paper used to be prepared at a time, as it would eep indefinitely; it had a blue tint. It was sensitised by floating it on solution of nitrate of silver, thirty grains to the ounce of water with orty minims of glacial acetic acid added, until the blue tint disappeared. The paper was then washed in two or three changes of distilled water, nd dried. After sensitising, the paper would keep good for some weeks; ut, if it were required for immediate use, the proportion of nitrate of ilver was increased while that of the acetic acid was decreased. Then a nore sensitive paper was obtained, but at the expense of its keeping ualities. The exposure was made between glass plates as with the alotype paper, but it had to be much longer—many times longer—owing o the absence of the gallic acid as an accelerator. The development of he negatives was by means of a solution of gallic acid to which a few rops, per ounce, of the sensitising solution was added. It was a tedious peration, though, if the negatives were fully or over-exposed, they might e brought out in less time than is sometimes expended on a present-day elatine plate. But usually it was a question of several hours, as many f the old hands well remember who have sat up best part of the night leveloping the results of the day's tramp, and not with the light and ortable apparatus of the present day.

These are the two processes in their essential details, though almost very worker had his own modifications of them. It will now be seen hat, although the paper in both processes is indurated with wax, there vas a wide difference between them. One was a wet process, and olerably sensitive; the other was a dry one, and very insensitive. The paper in the one would only keep a day or so, while in the other it would eep good for weeks. It will be noted that in both processes the image vas *in* the body of the paper, and not, as with modern gelatine papers, confined to its surface.

We will now resume the consideration of the exhibits. Nos. 253 and 254 are two calotype negatives, lent by Messrs. Wiggin & Son, taken by he late Mr. John Wiggin about 1855, and No. 266 is a frame of a couple f wax-paper negatives from the same source and of about the same date. They are good examples of the two processes. No. 257, lent by Mr. A. J. Taylor, is an earlier example of a calotype negative, about 1844, and 258 is a wax-paper one of a year later, taken by Mr. J. Stewart, who was ne of the early pioneers of photography. This negative, at some period r other, was kept in contact with printed matter, and the result has been he same as has often been the case with modern gelatine negatives, the ettering shows. These negatives were all the property of the late Mr. J. T. Taylor. Mr. W. Lang has lent a frame of early calotype negatives (No. 276), views near Bath. These are said to have been taken by Talbot, the inventor of the process. Four of them are very good and in an excellent state of preservation. One of the others has become stained, apparently by contact with damp paper while printing.

Very interesting exhibits are Nos. 124–9 lent by Mr. S. J. Hodson, They are views in the Exhibition of 1851 taken by Mr. Hugh Owen, F.S.A. All the prints from paper negatives, previously noticed, were made about the period the latter were taken. These, however, have been recently printed, and are consequently fresh and bright, and they serve well to illustrate what paper negatives of ancient date are capable of yielding. These prints also serve to show us, when compared with those from modern paper negatives, the relative granularity between them. In one of the cases is a portrait, from a paper negative, taken so far back as 1843, and lent by that veteran photographer, Mr. J. A. Forrest.

Before concluding the notice of paper negatives we must direct attention to a most interesting album (No. 278) lent by Mr. J. Willats. We noticed last week some Daguerreotypes taken by the late Messrs. J. & R. A. Willats. This album is locked up in one of the cases, but, through the courtesy of Messrs. Negretti & Zambra, we have had a leisurely look through it. The photographs it contains were collected by the late Mr. Richard Willats about the time they were taken, and consist of examples of the work and processes of most of the pioneers of photography, as well as the portraits and autographs of many of them. There is an example of "photogenic drawing" by Mr. Willats (1839), the year that Talbot's process was first published, and it is in a good state of preservation, now better indeed than many only two or three years old. There are portraits of the late Thomas Landseer, Sir William Allen, President of the Royal Scotch Academy, Gustave Le Grey, the inventor of the wax-paper process, and others of great interest. There is a view of the *Quadrant, Regent-street*, before the colonnade was taken down, by Cundell, 1847, and one by the same artist, 1844, of *St. Paul's from Blackfriars Bridge;* also several views by that early worker, Robert Bingham, as well as by many others. The album also contains some 12×10 photographs (collodion negatives) taken later on by Negretti & Zambra, depicting the result of the bursting of the Fleet river, or sewer, during a severe storm, and the destruction of the underground railway works then in course of construction. In this album are also examples of processes that now would be new to most modern workers: the energiatype, catylisotype, cyanotype, chromatype, &c. Some of them are as good as when they were first produced. Many of the old silver prints have suffered, but many of them are almost intact.

FOREIGN NEWS AND NOTES.

Anti-halation Paper.—Dr. Precht strongly recommends for backing plates the deep red tissue paper such as is used for making artificial flowers, and he also states that it can be used for dark-room illumination also. The paper, cut to the size of the plates, should be dipped into heavy paraffin oil, and then just rubbed into contact with the glass with the finger. Castor oil may be used instead of the paraffin; or, in fact, any oil which has the same refractive index as glass, which is about D=1·54.

The Tone of Lantern Slides.—R. E. Liesegang found that with short exposures with lantern plates and a hydroquinone developer unpleasant greenish tones are obtained, which may be avoided to some extent by increasing the exposure, and improved by subsequent intensification with mercury, but that the green tinge entirely disappears if potassium bromide be added to the developer.

Platinum and Gold Toning.—Kastner suggests the following treatment for matt solio paper, and states that it gives pure black tones. The prints are first toned in—

Solution of chloro-platinite of potash (1:100)	30 parts,
Potassium chloride	2 „
Water	1000 „

till they assume a bluish-violet colour, and they are then further toned in a bath of—

Ammonium sulphocyanide	20 parts.
Citric acid	20 „
Chloride of gold	2 „
Water	1000 „

After washing, the prints are fixed.

Physical Development.—R. E. Liesegang suggests the addition of gum arabic or fish glue to physical developers to prevent the formation of a precipitate, and he states this is especially valuable in developing partially printed-out gelatino-chloride prints with acid silver developers.

Reproductions of Drawings without a Camera.—According to Dr. Phipson, the following process is used in America for this work. A well-polished glass plate is coated in the dark with a mixture of—

Whites of eggs	2
Ammonium bichromate	46 grains.
Water	2½ ounces.
Ammonia	*q. s.*

The solution should just smell faintly of ammonia, and be filtered. The plate is first coated with this, and allowed to drain, and then coated again; and it is now dried by being moved quickly to and fro over a spirit flame. No coating can be seen on the plate when it is dry. It is exposed in diffused light under a drawing, engraving,

&c., from one-half to one and a half hours, according to the thickness of the papers. After exposure, it should be taken into the dark room, and coated with a solution of—

White wax	1 part,
Venice turpentine	4 parts,
Benzine	36 „

to which sufficient asphalt is added to give it a dark brown colour. The solution should be filtered several times through muslin. After coating, the plate should be allowed to drain. The plate dries very quickly, but still remains sticky, and should be dusted over with powdered graphite. It should then be placed, in the dark, in a dish of cold water, and left from thirty to ninety minutes, and then gently rubbed with a soft pad. All parts not affected by light will be washed away, and a very good negative be thus obtained. If a zinc plate be used, an image is obtained which will stand etching with ferric chloride 50 parts absolutely, alcohol 100 parts.

Death of M. Chardon.—On June 28 M. Alfred Chardon succumbed, after a long and serious illness. He was one of the pioneers of the emulsion process, and his first work on this subject was in connexion with the use of uranium in collodio-bromide emulsion. In 1877 he won the prize of the Société Française de Photographie for a collodion emulsion which was easy to make and which would keep well. In the same year he was elected an officer of the Academy. Latterly he had paid considerable attention to perfecting Poitevin's method of heliochromy.

Physical Intensification.—Gaedicke points out that mercurial intensification of dry plates presents numerous difficulties, and suggests as a substitute the following physical silver intensification :—

Distilled water	1000 parts.
Ammonium sulphocyanide	480 „
Silver nitrate	20 „
Sodium sulphite	240 „
Hyposulphite of soda	48 „
Solution of potassium bromide (10 per cent.)	5 „

For use take—

The above solution	6 parts.
Water	54 „
Rodinal	2 „

The plate to be intensified should be washed, but it is not essential that all the hypo should be removed, and it should be immersed in the solution and the dish rocked; it may also be poured on special parts for local intensification. The operation takes from five to ten minutes. If the intensification has been carried too far, it may be reduced with Farmer's reducer, and the intensification may be repeated after reduction if necessary. The density of the negatives increases on drying. The addition of potassium bromide, instead of retarding, hastens the action. The sulphocyanide must not be used to excess, as it softens the gelatine too much. Instead of rodinal, 0·3 parts of pyro, with 5 to 10 parts of ammonia, and 50 parts of water, may be used, or 25 parts of an ordinary glycin developer, with 25 parts of water, may be used. Metol tends to soften the gelatine too much. The advantages of this method are that there is no danger of poisoning, it is easy, works slowly, does not require total elimination of the hypo, and may be repeated *ad lib.*

WHAT PHOTOGRAPHS SELL.

A *Daily Chronicle* representative writes: There are no more loyal supporters of the Queen, the Prince and Princess of Wales, and the rest of the Royal Family, to be found anywhere than among the leading photographers of the metropolis. This was the chief impression I carried away from a round of visits paid to them recently; and, without imputing any sordid motives to these artists, it may be said that the reason lies on the surface, because the Queen, the Prince and Princess of Wales, and the rest of the Royal Family, are the most constant and unwearying patrons of the photographers. Frankly, it is difficult to conceive what the latter would do unless they had the former to "take," for the sale of royal photographs is a very considerable item in the business of royal photographers. These could not be numbered upon the fingers of two hands—there are half a dozen in Baker-street alone, and twice as many perhaps scattered over the West-end, and this fact makes it very difficult to estimate, even roundly, the number of photographs of the numerous members of the royal family are printed or sold in any given year.

Of course, this year it has been the Queen first, and the rest nowhere. Messrs. Downey are the proud owners of the Jubilee portrait of her Majesty, that is to say the one the Queen chose out of many that were taken by them, but its possession has not been an unmixed blessing. In the first place, it was to be "free," no copyright was to be claimed on it, and, as a consequence, it has been printed in pretty nearly every illustrated paper the world over. It has also entailed an immense amount of correspondence on the part of the firm, for all sorts of people wanted a copy of the famous negative for all sorts of purposes. Messrs. Downey themselves have reproduced it in a dozen different ways. Penny prints, remarkably good by the way, have been sold by the hundred thousand, collotype prints, photogravures, platinotypes, silver prints, by the thousand. Lantern slides innumerable have been furnished of it, and for people of wealth, enamels on copper, silver, and gold, in gris bleu and rouge sanguine, at so many guineas the square inch, have been supplied. One could not expect to go much higher than that, and yet the feat has been accomplished, and watch dials with the "four generations," including the Jubilee portrait, are now being turned out at a price which may be better left to the imagination. So much for the authorised Jubilee portrait. But there was another one in the field, and as it was taken ten years ago, and thus could be put on the market much earlier, it also had a very considerable sale; so that between this, that, and the other, it is impossible to say how many millions—in one form or another—of her Majesty's portrait have been put into circulation this year. Among the men of the reigning House, the Prince of Wales and the Duke of Connaught, are the favourites to the photograph-buying public; among the princesses, the Princess of Wales easily takes first place, but I was told by Mr. Downey that by far the most popular photograph now on sale was that of the three children of the Duke and Duchess of York, and one can easily understand that.

It is undoubtedly the fact that people do not buy the ordinary cabinet photograph to the same extent as they did in years gone by, be the subject what it may. The reason is pretty obvious. Just as soon as a photograph is in the shop windows the illustrated newspapers get hold of it, and it is reproduced everywhere. The more popular it is, the more it is published; and, as it is notorious that what can be bought for sixpence or less will not fetch a shilling or more, the photographers and the photograph sellers are hit heavily by this enterprise on the part of the newspapers. It may be said in a parenthesis, however, that the photographers make them pay pretty heavily for their enterprise. There is another reason also. We have had what are known as "albums" of celebrities for years and years. These are now not quite so numerous as they were, but in their places are the collotypes and the photogravures, which, while far more artistic and lasting than silver prints or the cabinet photographs, are also cheaper. It is surprising to learn that no fewer than 25,000 of one print in the art studies of Messrs. Downey have been sold, the subject being Mr. Wilson Barrett and Miss Maud Jefferies in *The Sign of the Cross*, while of this particular series, all scenes from the same play, the number sold runs into hundreds of thousands. Photographs of these players in *The Daughters of Babylon* have been hardly less in demand; so that, if one were inclined to accept this guide, there can be little doubt as to who are the most popular actor and actress of the day.

Next to royalties, the photographs of actors and actresses naturally come first. By all reports, for steady sale, Sir Henry Irving and Miss Ellen Terry are untouched. Others come and go; a successful play may give them a fillip for a time, but even such prominent actors as Mr George Alexander and Mr. Charles Wyndham sell more from the characters in which they appear than from their inherent virtues as individuals. There is, however, still a steady demand for Sir Squire Bancroft, who shares in his retirement the photographic popularity of Mr. Toole. When one comes to the ladies, the difficulty of awarding the palm is simply appalling. Yesterday it was Miss Maud Millett; but she is married and lost to the stage now, and her negatives are valueless. Miss Mabel Love commands a good sale, so does Miss Marie Tempest, Miss Letty Lind, Miss Marie Studholme, and a dozen others; but none of them reach that phenomenal popularity in a photographic sense which was once enjoyed by Maud Branscombe, Mrs. Langtry, and Mary Anderson. The days of "tens of thousands, such as Mlle. Cléo de Mérode, and La Belle Otero can claim at present in Paris, are gone by as far as London is concerned. Perhaps the ladies give too many sittings; perhaps there are too many of them; perhaps—but it would be ungallant to suggest that they are not sufficiently beautiful. At any rate, they do not "sell"—therefore there are no commissions, as far as I could gather, and also uncommonly few "free sittings."

It is rather a curious fact, by the way, that some of these actresses sell much better as art studies than when taken *in propriâ personâ*. "Give me a really beautiful woman," said one prominent photographer, "and her photograph will sell whether she is known or unknown, and will go on selling." That is very likely true, and yet celebrity or notoriety, or both, are a great deal even in selling bishops. For instance, Mr. Russell told me that his firm had taken all the English bishops within the last two years; but, except locally, or when one died, or when one was translated, there was very little demand for their photographs. The Bishop of Lincoln's trial literally boomed the right reverend prelate's likeness, but trials don't happen every day. What was wanted

to make any photograph go well was a sudden concentration of public attention on its original. There was an enormous sale, for instance, when the late Duke of Clarence died, and it was difficult to supply the demand. Not much can be said about politicians. They are more or less a drug in the market. Mr. Gladstone's photographs used to sell in great quantities, but the sale has fallen off lately. At present Lord Salisbury, Mr. Balfour, and Mr. Chamberlain pretty well divide the market between them, with the Colonial Secretary, thanks to his recent performances, a copy or two ahead. Mr. Jesse Collings obtains a fluctuating and spurious sale at the universities for his resemblance (in name alone, be it said) to Miss Lottie Collins, but the others are seldom "asked for," for which, no doubt, the illustrated newspapers are again to blame. Writers, artists, and such seem to be even at a lower depth. It is true that one photographer I spoke to uttered a pious wish that Miss Marie Corelli might be prevailed upon to pose, a thing she has never done yet, when he anticipated an enormous sale; but elsewhere I found little enthusiasm on the subject of novelists. Mr. Hall Cain is occasionally bought, though not much, but it may be stated, on no authority whatever, that in remote parts of the country he is occasionally sold as a substitute for Shakespeare. There are only two fashionable beauties now, I was told—the Countess of Warwick and the Countess of Mar and Kellie, though the latter has not yet given permission for her photographs to be sold. As some slight return for the number of French photographs we get over here, the British public may be interested to hear that Walery has the copyright on the photographs of the Duke of Orleans, of which Paris annually consumes a large number.

COLLODION AND OTHER BACKINGS.

When, in 1891, I published a formula for a collodion backing (see *Practical Photographer*, p. 169, 1891 volume), I was not aware of any previous similar solution for the purpose. From what I read, however, it appears that Captain Abney is the real author of the collodion backing; whether this be so or not is not a great matter. Captain Abney suggested years ago, for the prevention of frilling of gelatine plates, a coat of plain collodion poured on as a varnish prior to development, and I have negatives still in my cases which were made under those conditions. It was a step further, I thought, writing now of ten years or so ago, to tint this collodion with *eosine*, in order to interpose directly between the film and object to be copied a medium equivalent to an orthochromatic screen, the advantage being, so far as my recollection serves, and for the purpose intended, more apparent than real.

Then I remembered that the *coloured surface*, being as it was sometimes, if the collodion was used somewhat thin, of "matt" appearance, suggested the idea of a suitable *backing*. In order to secure a perfect and uniform "matt" or opaque surface, I used equal parts, or, at any rate, a mixture, of collodion and matt varnish (the latter deeply stained with dye being made from the Almanac formula) as a non-halative backing when photographing interiors, &c., and with considerable success. I consider the *matt* surface desirable; but there was another point in its favour, and that was, the dye or varnish was more easily cleansed off when the mixture was used.

I used this backing constantly at that time for interior, and sometimes exterior, work, and, personally, found no difficulty, provided the varnish was not too thin, in backing plates measuring 12 × 10 and 15 × 12, but I know that the operation was, and *is*, to the vast majority of workers—many of whom would be hard put to it to varnish a quarter-plate—a tremendous business. Even with the expert operator the least inattention or flurry, and a cool stream of coloured stuff would trickle down the fingers and wrist, leaving its marks for days; this, together with the strong smell which was trying in any room, to say nothing of the usual small dark room of the average worker, and the necessity for working in a dim light, made the process scarcely one for the million. I used the fluid myself, and sold supplies to friends, but from a purely business point of view it was not what one would call a success.

Now, the great advantage of keeping a backing of this kind by you is the perfect manner with which a reasonably expert operator can coat a few plates, the film drying very quickly, for immediate or early use; this is, I think, most important. If a backing takes some time to dry—two or three hours—the film is certainly none the better for it, to say nothing of risk from light action (few dark rooms are fitted with a drying closet), and to use them while still damp is not to be commended, and is likely to injure one's apparatus. The collodio-matt varnish backing dries at once; the plates can be placed in the slides without any delay, if used within a fortnight, say, and developed in reasonable time, the backing is not difficult nor troublesome to remove. During the operations of development the solution remains clear and unaffected by any colouring matter, a wipe with a piece of rag will at once remove enough of the backing to show progress of development, and, after fixing, or during the subsequent washing of the negative, all the coloured matter can be easily cleaned off with a tuft of cotton-wool saturated with methylated spirit; the extreme edge of the coating only causes trouble, requiring possibly something of the nature of pumice powder to remove it; but, as this *edge* is often outside the printing area, it is unimportant, or can, at all events, be left till the negative is dry, and therefore more safely to be handled.

It requires, undoubtedly, considerable practice in varnishing plates in order to become fairly expert in the manipulation of a backing of this kind; but it is worth the trouble. Backed plates are best for interior work, but also for many outdoor subjects, particularly—as I have had evidence of only lately—groups where white dresses are much in evidence. The "usual thing" would be improved on many occasions were backed plates used oftener; and, if this meant *fewer* plates used, probably there would be a dual advantage.

A word as to "coating" a plate with this collodion backing: Half-plates can be held by one corner between the finger and thumb of left hand; whole-plates and 10 × 8 require an extra finger. It is a good plan to use rubber finger stalls; you get a firmer grip of plate, and the sharp corner does not press quite so painfully in the thumb. If the plate requires support directly upon the *film* surface, and when using 12 × 10 and 15 × 12 plates all the fingers of the left hand will have to be requisitioned, I use a piece of pure white or brown paper interposed between the fingers and film, the plate is firmly levelled with the thumb at one corner and the four fingers outstretched; but really nothing but *practice* in coating or varnishing surfaces will suffice to give the necessary confidence. In spite of the trouble, I don't think I could be induced to use any other method of backing plates, and I am sure I have tried everything that has been recommended.

I append my old formula:—

Gun-cotton	1 ounce.
Methylated spirit	12 ounces.
Methylated ether (·735)	36 "
Magenta dye	a sufficiency.
Matt varnish	24 ounces.

J. Pike.

FIFTY YEARS HENCE.

Induced by the definite time point of the Jubilee of this year, there has recently been a general looking backward in every direction, the photographic one amongst them, upon the progress made during the last half century, and, natural consequence, much congratulation at its phenomenal extent. All very pleasant, satisfactory, and justifiable, but I think that looking forward and anticipating the next fifty or sixty years' probable advance would prove little less interesting. A slight nibble, now and again, has been made at the subject, but there is still enough left to make a handsome meal for one seeking it in this special direction. Colour photography, long before a half of fifty years have passed by, will probably have become a simple and an easily managed process, the means being regarded by the then novice as an adjunct as indispensable to his two or three-guinea outfit as a focussing screen or view-finder is to-day, presuming that the solution will be found, as it probably will, on the physical, rather than the chemical, side.

Whether we, by the way, will be as pleased in proportion with this same colour rendering as we are eager in seeking it is another matter, for, if, in addition to the excess of detail we are trying so hard to modify in, or keep out of, our artistic photographs of to-day, colour, which no two pairs of eyes see alike, be added, I rather fancy it may prove in a measure a thorn, and that our efforts soon would become directed towards modifying its excess or quality as well; thus conforming, in a minor direction, to the great law that appears to be governing our advanced civilisation all round, of making orthodox standards out of what is not natural; but let that pass until we actually gain the colour.

A duly improved cinematographic attachment, when the recording of motion is wished for, to be carried in the coat pocket, is probably another item within measurable reach. The excessive care needful nowadays to keep our plates from undue exposure to light will, again, to our photographic sons, be a thing of the past, for, with plates still far more sensitive than ours, all operations will be carried pleasantly on in broad daylight; the dark room will have atrophied off from "uselessness of function."

It looks rather startling, I admit, but would not Daguerre have admitted much the same thing, if some one in a prophetic mantle had foretold to him the accomplished sensitiveness of the dry plate of to-day? Or, supposing any one had, even five years back, prophesied the possibility of reproducing the photographed movements of a body of horsemen, or that of indicating on a print the position of a foreign body in his vesture of flesh, and that through a pile of books and a board or two, in addition, what would he have said to, and of, him? Yet we have seen these things done, and I doubt not that the immortal Weller's "gas microscope," to see "through a flight of stairs and a deal door," will soon be a saleable instrument. Hard lines it will be for some of us, who love privacy, when the man in the street, by simply putting on a pair of special eye glasses, will be able to see "what are trumps" on the back-parlour table. Let us trust that the evolution of a non-transmissible wall will have been reached first.

Granted that the extreme measure of sensitiveness has been reached with the present materials used, or as used, there may be other salts that, under altered conditions of use, could be employed in the coating of a plate, film, or sheet of paper, as to make them as much better than our present ones, as the present ones are, compared with those of the earliest photographers. It is likely enough, for instance, that such a body may

be found, quite insensitive to ordinary white light, but highly so to a specially coloured, or otherwise rendered active, one, enclosed, say, in the liquid form, in a hollow lens. In that case the prepared leaf might be torn out of a book upon the scene of action, placed under its clips, in the modified camera of that day, and a simple uncapping of the lens be all that would be further necessary.

We are but upon the fringe of scientific and photographic attainment.

What a gain to the future father or mother, anxious to catch little scenes for loving preservation, will this combined advance not prove. Instead of the feeble album of to-day, with its dull presentation of wooden attitudes, they will have the sparkle, colour, and movement of life; the baby splashing in the bath, or, later, racing over sunlit sands; children at their home games, as we best like to see them, either by daylight, gaslight, or firelight, for films—or papers—will be, by this, sensitive to any kind or quantity of light, success being merely a question of correct exposure.

Imagine, then, the photographer of thirty years hence out for the day. Having pocketed his lens, book of prepared paper, and the shallow, flat folding case, representing the camera, he sends his little boy to the nearest shop for three pennyworth of electric energy in the small brass accumulator; upon his return, slips it into place in his motor cycle, mounts the machine, presses a button at the end of one of the handle bars, and is away, at the rate of ten miles an hour, for his photographing spot. Arrived there, pressure upon a corresponding button at the other end of the bar stops the machine, and he is off and ready for work. The view selected, he takes out the camera and pushes the lens into position, for it goes without saying that screws will have been altogether done away with. The finder, too, will be such, that pressure upon a releasing spring will allow the camera to spring out only far enough to be in exact focus for the best taking of the amount selected, a kind of combined automatic finder and focusser, doing entirely away with the present tedious peering at the ground-glass screen, under cover of the crude and depressing black cloth; whilst exposure, the doubtful and trying element of to-day, will have become an assured and scientifically reliable one, for will not, in the Interacting Exposure Meter and Shutter, the action of the former cause the release of the latter for exactly the right fraction of time needful?

No attention attracting tripod will be wanted either, except perhaps for cinematographic work, plates being so perfect and so sensitive as to make it unnecessary.

With regard to subsequent treatment, development will probably not be needed, "latent image" surviving only as a disputed dictionary term of the past; the negative being turned out perfect—technically—ready for printing, and printing itself have been resolved into a taking of the finished print after a mere contact exposure of five seconds, twenty by gaslight.

Happy, indeed, will be the future lot of the photographer, both amateur and professional.

One thing only will remain unchanged, that which has remained so in the past, the highest, fortunately, of all, viz., the faculty of artistic selection and arrangement, the exercise of which must ever enter as, far and away, the most important factor in bringing about excellence in the ultimate result.

J. Rees.

PREVENTIVES OF HALATION.

[Translated from the Photo-Gazette.]

The question of halation is always coming up at society meetings. A method of coating the back of the plate with a substance capable of absorbing actinic rays has been recently advanced by M. Mussat, and is deserving of more than passing notice. M. Mussat makes use of gelatine rendered insoluble by means of formalin. With this insoluble gelatine he prepares films, which are applied to the back of the plate and which can afterwards be easily removed. His mode of procedure is as follows: The gelatine is softened in cold water, and then dissolved by placing the vessel containing it in a salt bath; some glycerine is then added, together with some finely ground red ochre. Suitable proportions of these substances are:—

Gelatine	15 parts.
Water	100 ,,
Glycerine	12 ,,
Red ochre	15 ,,

The mixture is shaken till thoroughly mixed, and, whilst still hot, is poured on to a glass plate previously cleaned and talced. A more even coating is obtained if the glass is previously warmed. The gelatine will set in a few minutes, and the plate is then placed in a bath of commercial formalin (containing 5 parts of formalin in 100 parts of water) for a quarter of an hour; it is then washed and dried. When thoroughly dry, the film will easily detach itself from the glass. To use these films, they are given a thick coating of an adhesive containing—

Gum arabic	75 parts.
Glycerine	12 ,,
Water	125 ,,

A little salicylic acid may be added if it is desired to keep the mixture very long. After having been thus stripped and coated, the film is applied to the back of the sensitive plate (of course, in the dark room) and the plate stood up to dry. The plates can be kept when once prepared in this manner and are ready for placing in the dark slides. Before commencing development, the plate is placed in water, when the film will detach itself in a few seconds. If removed with care and dried, it can be used a second time. The author of this method has obtained excellent results with plates prepared in this way. The obvious advantages are, that it is very handy, and does not stain either baths or fingers; but there seems to be some difficulty in employing it with plates of fairly large size. Even with plates 13 × 18 centimetres (7 × 5 inches approximately) difficulty was experienced in securing perfect contact between the film and the glass—a condition which is quite indispensable for counteracting halation.

For large-sized plates we have seen a black matt varnish (obtainable at all oil and colour merchants) used with success. It dries instantly. Before commencing development it must be removed with a pad moistened with alcohol.

It is, however, much preferable to use a backing mixture recommended by M. Drouet, the formula for which is as follows: 100 parts of red ochre are mixed with 50 parts of dextrine, both dry; the whole is finely powdered, and 50 parts of water and 5 parts of glycerine added. An antiseptic is added if it is wished to keep a large quantity, but the preparation of the mixture is so simple that it may be freshly made for each lot of plates to be backed. It is easily spread on the back of the plate with a flat brush. Before development the coating can be removed by simply washing the plate in a dish or under the tap.

For those who wish to avoid all manipulation, it may be mentioned that plates can now be obtained in commerce—notably the anti-halation plate of Guilleminot—containing a preparation which protects the film from reflected actinic rays. Immediately behind the sensitive film, *i.e.*, on the glass, a special film is interposed, upon which the emulsion rests, but which does not prevent the progress of development being judged by transmitted light.

Whenever photographs of interiors or of scenes under trees have to be taken, the photographer should avail himself of one or other of these preventives of halation if he desires to avoid the usual result of halation—want of detail in those parts where the light strikes directly towards the camera.

V. Teran.

MERCIER'S PROCESS FOR ELIMINATING HYPOSULPHITES.

Photographic negatives or prints, says M. Mercier, are usually subjected to a final treatment by a solution of hyposulphite of soda in order to dissolve the argentic salts, which treatment is termed the fixing, after which they are washed for some time in order to eliminate the hyposulphites. Such washing often consumes a considerable time, especially when the treatment with hyposulphite of soda has been incomplete, as the negatives and prints retain in such cases an argentic hyposulphite which is insoluble in water and withstands the action of ordinary washings.

My invention relates to means for avoiding these long and tedious washings by the use of solutions prepared with the aid of iodine or iodides, bromine or bromides, in the following manner, that is to say:—

1. I may dissolve in water alkaline iodides such as iodide of potassium or iodide of sodium. I have discovered that alkaline iodides decompose argentic hyposulphites contained in the negatives or prints as they are withdrawn from the fixing bath, while thus facilitating the washing of the negatives and prints to a far higher degree than alkaline chlorides, such as common salt, which had been heretofore recommended as a dialytic eliminator of hyposulphites.

2. Instead of using alkaline iodides alone, I may use conjointly with them salts having an alkaline reaction such as carbonate of soda, sulphite of soda, sodic phosphates and the like, or an alkali such as potash soda or ammonia. I have discovered that the elimination of the hyposulphites is thus more rapid than with the iodides alone. I often add to the above compounds a small quantity of common salt, which, however, is not indispensable. As a practical illustration of the above indications, I may use a solution containing about four grammes of iodide of potassium in one litre of water, or I may use the following:—

Iodide of potassium	4 grammes.
Carbonate of soda	1 gramme.
Common salt	30 grammes.
Water	1 litre

I may substitute for the above alkaline iodides alkaline bromides, but in such cases the elimination of the hyposulphites proceeds more slowly.

Instead of using alkaline iodides or bromides in the solutions above named, I may prepare them directly with bromide or iodine, which method was the first employed by me, the former process having been discovered subsequently after further experiments.

To prepare the latter solutions, I dissolve iodine or bromine in a suitable quantity of water with an alkaline salt, and by preference carbonate of soda. I may use by way of example the following formula:—

Powdered iodine	3 grammes.
Carbonate of soda	30 ,,
Water	1 litre.

To facilitate the solution of the three grammes of iodine, I dissolve them previously in forty grains of alcohol or thereabouts.

I thus obtain a yellow solution which cannot be used forthwith for it would corrode the photographic image; it is therefore necessary to wait until it becomes spontaneously discoloured, which requires from one or two days or longer, or it may be discoloured by heating it for a few minutes, or by adding thereto a small quantity of ammonia; when the solution is discoloured and cool, it can be utilised forthwith.

Colourless solutions of the kind above described may be obtained by adding a small quantity of sulphite of soda or by using the latter alone in lieu of the carbonate of soda, but it is preferable to use the carbonate alone, in order to prevent the introduction of sulphurous compounds in the eliminating means.

To use my solutions, the photographic negatives or prints impregnated with the hyposulphite of the fixing bath are slightly washed with water to remove the largest portion of its hyposulphites, they are then immersed in one of my solutions for a short time, varying from five minutes to one or two hours, according to requirements. The negatives or prints may be passed through several similar baths if required, the operation being completed by washing them for a few minutes in clean water.

The efficacy of my process can be readily demonstrated, particularly as regards negatives or prints which have not been left long enough in the fixing bath and are still impregnated with argentic hyposulphite, which is insoluble in water, and it is easy to ascertain when the negative or print contains no more hyposulphite by slightly touching a point of the white parts of the print with a brush previously dipped in a ten per cent. solution or thereabouts of nitrate of silver, when, if there be any hyposulphite left, there is formed a yellow spot at the said point.

DRY PLATES FOR RADIOGRAPHY.]

Dr. Max Levy, of Berlin, who has patented some improvements in sensitised photographic plates and films for the above purpose, points out that Röntgen X rays have the property of producing latent light pictures on plates or films prepared for ordinary photographic purposes, and coated with a light-sensitive emulsion, such pictures being developed as negatives by the ordinary known methods. "All experiments," he says, "made with the view to produce dry plates particularly adapted to the reception of X rays, have failed; the ordinary highly sensitive dry plate has hitherto been unsurpassed in practice.

"According to the present invention, an important increase of strength is attained, that is to say, the period of exposure is shortened if the plates are covered with several separate light layers placed one over the other. The most simple way of carrying out this principle consists in depositing a light-sensitised layer on each side of a transparent carrier plate, such as celluloid or glass, which is made as thin as possible, and is chosen for its transmission of X rays. It is only necessary to take care that, when in the baths, the upper and the lower layer be evenly acted upon.

"A strengthening of the action, and consequent shortening of the time of exposure, is attained by pouring a series of layers on one side of a suitable plate. It is then necessary to separate the thin layers from each other by a suitable material, so that the passage of the developer and of the light rays is unhindered; for example, sufficient separation is obtained by superposing several plates, or the like, layer on layer, as herein described, the thin layer of air effecting the separation. On the contrary, no success is attained by simply increasing the quantity of the emulsion poured out, or by the arrangement of various sensitised layers directly one on the other.

"If in the processes described a supporting plate is used sufficiently transmitting the X rays, it can be used on both sides, and thereby the number of layers, and thus the superposed single pictures are doubled.

"The principle is not only applicable for use with the X rays, but also where the corresponding photographically active rays are not entirely absorbed by the upper sensitised layer; for example, by using a suitable silver salt and suitable strength of layer, a normal dry plate, and, with ordinary light, a second plate lying thereunder, may be sensitised, and will reinforce by superposition."

THE LATE W. H. HARRISON.

By the death of Mr. W. H. Harrison, which took place on Tuesday last, August 10, aged 56, the photographic world loses a member of that active army of scientific workers who have done so much to develop the art-science. Mr. Harrison began life in the employ of the Great Western Railway in the Telegraph Department at Paddington. He speedily rose, step by step, and was selected, from his aptitude as a careful experimenter, to take charge of the Haverfordwest end of the submarine electric cable lying between that place and Wexford, Ireland, his chief duty being to daily test the cable for damages and interruptions from whatever cause arising.

During his stay at Haverfordwest, he made a series of contributions to the local press, which attracting considerable attention, he was offered and accepted an appointment on the staff.

In 1865 he commenced writing for the *Engineer*, and in the same year, became acquainted with the late Cromwell Fleetwood Varley, F.R.S., M.R.I., M.I.C.E., then the engineer to the New Atlantic Telegraph Company, and engineer of the Electric and International Telephone Company. His friendship with Mr. Varley lasted until the death of the latter in 1883. Whilst in Haverfordwest, he devoted much attention to photography, especially in the elucidation of some of the problems involved.

Mr. Valentine Blanchard's method of preserving wet plates so that they could be carried for a whole day without deterioration was naturally taken up by him very warmly, and, in 1865, he obtained land and sea views by this discovery which would otherwise have been impossible. From this time forward he contributed numerous articles to The British Journal of Photography, not only on the working and manipulation of preserved wet plates, but also upon improvements in the construction of tourists' cameras to secure portability, efficiency, and steadiness, conditions now so fully recognised.

In 1868 he communicated to The British Journal of Photography a remarkable paper describing his discovery of a bromide emulsion dry plate, and also the use of an alkaline developer.

Mr. Harrison never received any pecuniary reward for his work and labours. In the sixties he was engaged on the permanent staff of the *Daily Telegraph*, chiefly contributing the scientific news and articles. In later years he was for some time editor of the *Photographic News*, and contributed to other photographic journals. His name was as well recognised in America as in this country, and he was appointed correspondent of *Anthony's Photographic Bulletin*, of New York.

For some ten years of his life he was interested, with several other influential persons, in the investigation of Spiritualism, and edited a journal devoted to the subject. He also published a series of humorous poems, some bearing on photography, and entitled the "Lazy Lays and Prose Imaginings," which at the time of issue attracted considerable attention and favourable notices from the press.

As a writer on scientific subjects, photography, engineering, and chemical industries were treated by him in a broad and comprehensive manner, especially those which had any application to photography; and lectures upon chemistry and experimental physics at the Royal Institution and other scientific bodies, both English and foreign, were never lost sight of, but fully and carefully reported.

The deceased gentleman had for some time past suffered from paralysis of the brain, which incapacitated him from work.

Our Editorial Table.

The Cadett "Lightning" Plates.

Cadett & Neall, Ashtead, Surrey.

On the subject of the keeping qualities of plates of extreme rapidity, Messrs. Cadett & Neall write us as follows: "We cannot let it be considered that our make is inferior in keeping qualities to that of any other. We therefore send you a sample for test and report of a batch made in September, 1895 (two years ago), and of another made in January, 1896, both 'Lightning' brand, the former, batch No. 51001B, being equivalent to 81 H. & D. ferrous-oxalate standard speed number, and the latter, batch No. 60201A, 100 speed, in their original wrappers. The earliest batch has been in our bins since date of manufacture, and the latter batch was returned to us last month by a dealer in Lancashire, at our request, who had them in April last year." Our former experiences of the keeping qualities of the Lightning plates fortified us in the expectation that the boxes of plates sent us would behave satisfactorily on trial, and this proved to be the case. On development with metol and carbonate of potash we obtained clear images without fog, and the plates appeared to be all that one could desire in practical work. When kept under proper conditions, there is no doubt that very sensitive plates retain their good qualities for a length of time such as complies with all reasonable requirements.

The "Telos" Negative Paper.

Otto Scholzig, 31, Binfield-road, Clapham-road, S.W.

The "Telos" negative paper is coated with an emulsion of great rapidity, and yields results of such excellence as to justify the expectation that it will find considerable appreciation. It is preferably used in a special cardboard holder supplied for the purpose—a rectangular frame supporting it against a cardboard back, the whole thing being then readily placed in the dark slide like a glass plate. Development takes place as usual, but, after the final washing, it is

recommended to place the negative in a glycerine solution, one part in fifteen of water, and allow to dry, face up, on blotting-paper. When dry, the negatives are soaked for about half an hour in a special transparent oil supplied for the purpose, in a dish or plate, till the grain of the paper has entirely disappeared. The oil can also be applied to the paper side by means of a brush or a tuft of cotton-wool. Drain off the oil, and carefully remove all the surplus from both film and back by blotting-paper. The film side is then brushed over with cold negative varnish and allowed to dry.

The "Brilliant" Plate.

Otto Scholzig, 31, Binfield-road, Clapham-road, S.W.

A sample of a new plate that he is introducing called the "Brilliant" has been sent us by Mr. Scholzig. It appears to be a carefully prepared plate of high rapidity, and the results it produces are satisfactory in all respects.

Messrs. John J. Griffin & Sons, of 22, Garrick-street, Covent Garden, send us their wholesale price-list of technical chemicals for photography, process engraving, photo-lithography, photogravure, collotype, and radiography. The list will, doubtless, be found useful by those practically interested in the above branches of photography.

The "Sunny" Memories Mounts.

Percy Lund, Humphries, & Co., Bradford.

These mounts will, doubtless, be extremely popular with amateur workers as they provide a novel and effective way of artistically mounting photographs. The portion carrying the cut-out opening is partly detachable from the cardboard support, so that, when the photograph is placed in position, it is the simplest matter to gum down the leaf. The openings are of various sizes, and the papers are of artistic tints, calculated to well harmonise with platinum and carbon prints.

The Junior Photographer.

Percy Lund & Co., Bradford.

The volume of our contemporary, for 1897, has been sent us by the publishers. It is full of sound information and advice on artistic and practical photography addressed to beginners, and is embellished with many reproductions of photographs of an educational character. For the class to whom it appeals the *Junior Photographer* is well adapted, and it is conducted with great acumen by Mr. Matthew Surface. Its get-up is excellent, and the volume makes a useful gift book.

Catalogue Received.

Levi Jones & Co., Limited, 71, Farringdon-road, E.C.

This condensed price-list is full of illustrated particulars of an extensive assortment of photographic apparatus, chiefly designed for amateur use. Views of the firm's manufacturing premises are given.

The "Platystigmat" Lens.

In our reference last week to Wray's new Platystigmat lens, we omitted to mention that the focus of the two objectives we submitted to comparative tests was five inches.

News and Notes.

M'Smith: "How do you account for there being so many queer views of life?" Bumpus: "So many amateur photographers."

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for current month has been awarded to Mr. W. E. Francis-Francis, Kilmorey Park, Chester, for his negative, *Caged Majesty*.

The Eastman Kodak Company, of Rochester, New York, have organized a series of prize competitions for American photographers. The following extract from the prospectus give an idea of the nature of the competitions, which are evidently characteristic of Eastman enterprise: "A good display of Kodaks at this season of the year cannot fail to pay you well for your time and trouble, and, in addition to the advertising you will get out of it, you may receive a cash prize. It all depends upon how attractive you make the window. To stimulate an interest in the displaying of our goods, we offer the following prizes to dealers for the most attractive display windows, as shown by photographs to be submitted to us." The prizes range from 100 dollars to 10 dollars.

The Hand-camera Postal Club.—Mr. G. V. Myatt, Hon. Secretary of this Club, writes: "I take the liberty of herewith sending you a copy of the rules, &c., of The Hand-camera Postal Club. As it is, as far as I know, the only postal club devoted entirely to hand-camera work, its position is unique in the photographic world, and, as you will see from our list of members, some of the best workers of the hand camera are enrolled, and only first-class workers are eligible when there are any vacancies."

"As showing the very widespread use of Ilford P.O.P., it is interesting to us to record the receipt of quite a collection of photographs, lithographs, paper samples, drawings, and plans, which have been sent to us by the Post Office authorities. This arises from the senders using the empty tubes for the purpose of carrying prints, &c., to their friends, and tying on their address labels insecurely. These labels have been lost in the post, and the authorities send the tubes and contents on to us as our name and address is on the tubes. We may add that we have in all cases returned the parcels to the Post Office authorities."—*Photographic Scraps.*

About this time every year the Société de Mulhouse issues a "Programme des Prix," to be awarded in the following year. The list of prizes to be awarded in 1898 contains no less than 144 prize subjects, among them a medal and 1000 francs for the production of a substance to replace the albumen of eggs in making painters' canvas; 1000 francs for an albumen to replace the white of eggs in all industrial uses of the same. All the prizes are open to every one, except the members of the Committees of the Société Industrielle and the Council of Administration. Competing memoirs must be sent, before February 15, 1898, to the President of the Society. A copy of the Programme des Prix will be sent upon application to the Secretary.

The Naturograph Syndicate Limited.—This Company has been registered by Courtney, Croome, & Co., of 9, Gracechurch-street, E.C., with a capital of 50,000*l.* in 1*l.* shares, of which 600 are deferred. The objects of the Company are to enter into an agreement with Richard B. Roxley, and to carry on business as photographers, printers, &c. The following are the subscribers: H. Stocks, 28, Dorset-street, Portman-square, W.; T. D. Farrall, 82, Judd-street, Euston-road, W.C.; F. W. Hull, 67, New Oxford street, W.C.; E. S. Du Dubuque, Bush Hill Park, N.W.; A. Feltham, 19, Iver-street, S.W.; T. Richards, 61, Packington-street, Islington; W. B. Francis, 90, Maygrove-road, N.W. The first Directors, to number not less than three, nor more than seven, are to be nominated by the subscribers; qualification, 100*l.*; remuneration, 150*l.* each per annum, and an extra 50*l.* for the Chairman.

One of the big daily papers has made a big discovery. In an article on "Photographs"—histrionic and otherwise—it declares that the days of tens of thousands, such as Mlle. Cléo de Mérode and La Belle Otero can claim at present in Paris, are gone by as far as London is concerned. This pronouncement comes almost immediately after another to the effect that no fewer than 25,000 of one print in the art studios of Downey & Co. have been sold, the subject being Mr. Wilson Barrett and Miss Maud Jeffries in *The Sign of the Cross;* that scenes from the same play sold by hundreds of thousands, and that photographs of the same players in *The Daughters of Babylon* have been hardly less in demand. It might be thought that the great discoverer intended his readers to understand that the days of tens of thousands have gone, and the days of hundreds of thousands have come; but, then, there is the suggestion that the London actresses give too many sittings, and the awful suggestion that they are not sufficiently beautiful.—*Referee.*

The Tate Gallery.—Though the formal opening of the Tate Gallery took place some time ago, it was only on Monday that its doors were thrown open to the public. From ten o'clock in the morning a stream of people poured into the Gallery. Among the visitors was Mr. Henry Tate himself, who came to pay a visit to his own creation, and expressed himself much satisfied with the arrangements. Many working men and women were to be seen wandering through the rooms and gazing with much interest at the pictures, for Grosvenor road borders on a very busy and working-class neighbourhood, and it seems evident that the residents there are not going to neglect the beautiful Art Gallery which has been placed so close to their doors. Many lingered before Mr. Wyllie's fine picture, *The Pool of London*, depicting a scene that must have been familiar to all, while the pathetic group represented in *The Doctor*, by Mr. Luke Fildes, also attracted much notice. Crowds of children, enjoying brief holidays from the Board schools, streamed merrily into the Gallery, which they evidently thought a fine new place of amusement, and divided their attention between the pictures and the little fountain playing in the central hall. The Gallery is open every day from ten till six. The students' days, when admission is 6*d.*, are Thursdays and Fridays. The Gallery will be open on Sunday afternoons from April to September.

The British Association for the Advancement of Science met last Wednesday (August 18) at Toronto, under the presidency of Sir John Evans, K.C.B., F.R.S. It is announced that his address will deal mainly with the antiquity of man. Section A will be presided over by Professor A. R. Forsyth, F.R.S., who will deal with the higher branches of mathematics; Section B will be under the care of Professor W. Ramsay, F.R.S., who will have something to say about an undiscovered element; Section C will be presided over by Dr. G. Dawson, C.M.G., whose address will be more particularly devoted to the ancient rocks of North America; Section D will have as President Professor L. C. Miall, who will speak about the transformation of animals; Section E will be under Dr. J. Scott Keltie, the Secretary of the Royal Geographical Society, who will naturally deal with some of the problems which geographers have before them; Section F will be presided over by Professor E. K. Gonner, who will deliver an address on the labour question and social and economic matters generally; Section G will be addressed by Mr. G. F. Deacon, who will deal with the great advances that have been made in mechanical science since Toronto (formerly known as York) was a little village; Section H will be presided over by Sir W. Turner, who will discourse on *Some Distinctive Characters of Human Structure;* Section I will be under Professor Michael Foster, Sec.R.S., who will deal with the more important advances made in physiological research during the last thirteen years; Section K will be presided over

Professor Marshall Ward, F.R.S., who will have something to say about study of botany. The Friday evening discourse will be by Professor berts-Austen, C.B., F.R.S., chemist and assayer to the Royal Mint, on the portant subject of Canada's metals. The discourse on Monday evening will by Professor John Milne, F.R.S., on *Earthquakes and Volcanoes*, while Saturday evening lecture to working men will be by Dr. H. O. Forbes on itish New Guinea.

GAS MANUFACTURE IN THE METROPOLIS.—In spite of the progress of elec city as an illuminant, there appears to be no diminution in the demand for s, and the growth of the latter manufacture in the Metropolis is strikingly own by the experience of the Gas Light and Coke Company in the last six nths. It may be stated, by way of preface, that since 1887 the gas sold by at Company has risen from 16,788,208,000 cubic feet for the former year up 20,115,728,000 cubic feet for last year. In the first half of 1897 there was ld 10,543,386,000 cubic feet, a quantity which is considerably more than half e quantity for the preceding year, and is about 690,692,000 cubic feet more an the quantity sold during the first six months of 1896. This improvement attributed mainly to two causes, the increase in the use of gas by the auto atic prepayment meter system, and the expanding use of gas for heating and oking. In all, there were carbonised in the first six months of the present ar no fewer than 1,043,107 tons of coal, about 14,000 tons of which were cannel d the remainder ordinary coal. The coke made in the half-year was 633,670 ns, of which about five-sixths were sold; a considerable quantity was also ed in the manufacture of gas, and the stocks of coke were reduced in the x months. The coke yielded 190,445*l.*, after paying for the labour, &c., in disposal, whilst ammoniacal liquor, tar, and other residual products bring the amount received to 308,446*l.*, or nearly three-fifths of the cost of the al and of its transit to the works of the Company from the collieries. The crease in the yield of the residual products has continued for some time, and ought them to comparatively low prices; but, so far as sulphate of ammonia concerned, these low prices seem to be enlarging its use, it being now latively cheaper than nitrate of soda.

PHOTOGRAPHIC EXHIBITION AT WEXFORD.—At this Exhibition, which wa eld on Saturday and Monday, August 7 and 9, Mr. Alfred Werner was Judge. he following were his awards:—Silver and bronze medals were awarded in all asses. The rules did not allow withholding of awards. Class I. Quarter-plate andscape and Marine.—First prize, W. H. M'Guire, Wexford, subject, *Early pring;* second, Eva Wisdom, Wexford, *Woodland Scene.* Mr. M'Guire's iew was an excellent one of the road and wood at Edermine Gate. There ere splendid views of Scottish scenery in this class by Mr. J. E. Shannon. mong other exhibitors were R. Hadden, Nina Wisdom and F. J. Owens. lass II. Half-plate Landscape and Marine.—First, J. B. Pettigrew (who was, erhaps, the largest exhibitor of collections), with a view of Strathern, Perthhire; second, a charming view of Dargle Bridge, by M. A. Ennis. In this lass was a splendid view of Turret River, by J. B. Pettigrew. Class III. igure and Animal Studies.—First, Miss Jefferies, female figure in Grecian ostume; second, W. H. M'Guire, *Neddy*, the donkey. Other exhibitors were Ion. Gerald Fitzgerald, Robert Hadden, F. J. Owens, George Hadden. Class V. Half-plate Studies, Figure and Animal.—First, Miss Jefferies, Newbay, *Hearts are Trumps*, after Millais; second, George Hadden, Wexford, *Thank You.* Both were exceptionally clever and pretty groups, artistically arranged nd composed. There were many other fine groups and figures in this class rom M. A Ennis, J. B. Pettigrew, C. E. Vize, F. J. Owens, W. H. M'Guire, nd J. E. Shannon, &c. Class V. Instantaneous Subject on Land or Water.—First, J. B. Pettigrew; second, G. Hadden. Class VI. Instantaneous Subject n Water.—First, M. A. Ennis; second, J. B. Pettigrew. In these instantaneous classes Mr. Ennis exhibited some fine views of bathers, while Mr. Pettigrew could not be approached as far as views of yachts in motion were oncerned. Class VII. Instantaneous Views, any size.—First, M. A. Ennis; econd, J. B. Pettigrew. Class VIII. Interiors.—First, M. A. Ennis, interior Sodality Room, Convent of Mercy; second, J. E. Shannon, interior of Aghol Chapel. Class IX. Enlargements.—First, M. A. Ennis; second, J. B. Pettigrew. The chief feature in this class was the splendid collection of enlargements by M. A. Ennis. Class X. Opals or any other kind of Fancy Photography.—First, M. A. Ennis; second, J. B. Pettigrew. Class XI. Lantern Slides.—First, O'Neill F. Kelly; second, F. J. Owens. Class XII. Landscape Views (Open).—First, R. C. Robbins, Seacombe, Cheshire; second, R. Colles, Kilkenny. This was perhaps the most interesting class of all. Mr. Robbin's Prize-winner, *An Arcadian Village*, was equal to any painting, and was, indeed, a charming piece of work. It would be difficult also to say too much for the very artistic views of Mr. Alex. Old, who, in every case, secured the most surprising and striking effects. Other clever exhibitors were A. M. Geddes, Kingstown; Mr. Simpson, Kingstown; and M. A. Ennis. Class XIII. Figures.—First, A. M. Geddes, Kingstown; second, R. Colles, Kingstown. Class XIV.—First, A. M. Geddes; second, J. Simpson. A special prize was awarded to R. C. Robbins for having the best photograph in the Exhibition. Mr. J. E. Shannon gave a limelight entertainment to the audience, and exhibited, amongst many interesting slides, some fine views of Scottish scenery, taken by himself.

Patent News.

THE following applications for Patents were made between August 3 and August 7, 1897:—

LENSES.—No. 18,157. "Improvements in Photographic Objectives." Complete specification. F. R. VON VOIGTLÄNDER.

APPARATUS FOR DEVELOPMENT.—No. 18,254. "Improvements in Apparatus for Developing Photographic Pictures." Communicated by J. Mandl. R. SIMON.

CAMERA STANDS.—No. 18,325. "Improvements in, or connected with, Stands or Supports for Photographic Cameras and suchlike Articles." L. SIMONNET.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
23	Bradford Photo. Society	Open Night.
23	North Middlesex	Circulating Exhibition of the Affiliation of Photographic Societies.
24	Birmingham Photo. Society	Exhibition of Competition Pictures for June Excursions: Leamington, Ombersley, and Berkeley.
24	Hackney	*The Management of the Camera in the Field.* A. Barker.
25	Photographic Club	Open Night.
26	Bradford Camera Club	*Squeegeeing and Mounting.* Mr. Swinden.
28	Birmingham Photo. Society	Excursion: Kenilworth. Leader, Wm. Rooke.
28	Darwen	Excursion: Ribchester. Leader, Jas. Cavis.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 12,—Mr. W. D. Welford in the chair.

Mr. A. L. HENDERSON asked that a correction might be made in the minutes of the previous meeting. It was that sulphide of ammonium or potassium is used by Messrs. Wilson & Co. in making transparencies, not Messrs. York, as stated, and he is not aware what Messrs. York use.

Mr. T. E. BULLEN showed some specimens of yachting photographs, and, in answer to the Chairman as to whether any retouching had been made on them, said, as far as he knew, there had not, as they had only been taken a few days ago.

Mr. Henderson showed an experimental picture, which he afterwards presented to the Association. It was taken with a No. 3 Stigmatic Dallmeyer lens, *f*-6·4, focal-plane shutter at $\frac{1}{200}$, Prize Paget XXXXX backed plate, Lumière's Citos paper, toned with gold, hypo with a trace of formic acid, and sulphocyanide of ammonium; mounted with glutogen, and rinsed with distilled water before drying.

Mr. J. E. HODD asked if any member had made an exposure, using a shutter as early as four o'clock in the morning, as he had made one while at Stromness at 4.5 a.m., using a Thornton-Pickard snap-shot shutter at one-fifteenth of a second, with lens at *f*-8, and was surprised at the good result he obtained. The negative was a little under-exposed, perhaps, but, only having this shutter at hand, he had used that.

The CHAIRMAN said he had taken a picture as early as 3.30 a.m., shutter working at one-fifth, and said that in crossing to the Continent from Harwich he had made several exposures in the early morning, and that very good results were to be had of the clouds and sea at that time.

Mr. HODD spoke of a batch of gelatino-chloride prints he tried to tone. He put the prints in the bath and they turned from brown to all sorts of colours, including a brilliant blue, and finally settled down to a brown, the whites being of a drab tint. He was working to a grain with the manufacturer's formulæ, and had never had that experience before, although he had used a similar toning bath and the same brand of paper.

Mr. HENDERSON suggested impure water as the cause.

The SECRETARY asked if the dishes were splashed with hypo.

Mr. HODD said he had used different dishes, and knew they were clean, but the prints were just the same.

The CHAIRMAN, speaking of some bromide prints, remarked that he had bought five different brands of bromide papers, half-plate packets and quarter-plate packets. In each case the half-plate packets were perfect and the quarters were fogged, the same developer being used for each. He also showed some paper negatives, which he had made that day, one taken in brilliant sunlight on a building, with lens at *f*-25 and exposure one-fortieth of a second. He also exposed one on an interior, and a plate at the same time. The paper negative he gave five minutes, the plate ten minutes. The plate showed much more halation than the paper negative. He was surprised at the speed of the paper negative. They were best used in an old-shaped slide, with the hinged flap at the back. They were held flat in the slide by a cardboard holder.

North Middlesex Photographic Society.—August 16. Instruction Evening. Mr. H. Smith in the chair.—Mr. H. W. BENNETT, F.R.P.S., gave a demonstration on

PRINTING.

He said he would endeavour to show how to make the best of a negative in printing. Too many photographers spent all their energies on getting a good negative, but did not take sufficient care with their prints. Not sufficient attention is given in text-books, &c., to this subject. He showed many examples of what could be done by means of pasting vegetable tracing paper on the back of the negative, and using the pencil to lighten up parts, or put in high lights, or by cutting out parts to allow too dense portions printing deeper than they otherwise would have done. Another method of lightening portions of the negative consisted in affixing to a plain sheet of glass a part of a waste print that printed too dark originally, care being taken to accurately cut it out. This is placed over the negative while printing, and the required depth of tone obtained. It is necessary that a printing frame larger than the negative should be used. Very often the top of a negative of an interior printed too dark, owing to the lens having had to be raised considerably, which allowed less light to reach that part of the plate through the diaphragm. This could easily be remedied by shielding that portion with a card about an inch from the surface of the negative, held in a slanting direction, to prevent the shading off being too sudden. In the competition for prints taken at the outing to Totteridge, Mr. Goodwin was placed first and Mr. Taylor second.

FORTHCOMING EXHIBITIONS.

1897.	
August 31	Royal Cornwall Polytechnic Society, Falmouth. Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 1–Oct. 13	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
October 4.....	Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
December 9–11	Aintree Photographic Society.
1898.	
April.....	International Photographic Exhibition (Crystal Palace). R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BACKING PLATES.

To the EDITORS.

GENTLEMEN,—As the subject of backing plates with coloured collodion seems to be exercising the public mind to some extent just now, I feel impelled to say that I have used that method, off and on, for many years past, without experiencing the troubles and difficulties that appear to be now rife. Your correspondent, whose experience started the outcry against collodion, must, to say the least, be an unwise individual to try his first experiment with a new and unknown plate on such a special occasion, and when his negative had to be finished in such a hurry; and I am scarcely therefore surprised at the recountal of his various attempts to get himself out of a mess. But, I guess that, vulgarly speaking, "the fat was in the fire," when so careful a worker as my friend, G. W. Webster, found that his operator or printer had got into similar difficulties to the detriment of a lot of platinum prints.

If any one finds the removal of the collodion backing troublesome, let them try the simple plan of using a broad, sharp chisel, or, perhaps better still, a cabinet-maker's steel scraper, applied firmly to the back of the plate while the collodion is moist. It comes away without the slightest trouble in a single sweep, and, needless to say, there are no floating particles to cause trouble, to prints or anything else. If the backing has become dry, moisten it with a mixture of methylated spirit with a little glycerine, applied with a sponge or rag.

As regards staining the film, I have used several different aniline as well as other dyes, but have never had any difficulty with a permanent stain; any colouration that is not removed by simple washing will give way to a short soaking in very weak ammonia, and sometimes a little alcohol will aid matters. Further, so far as my experience goes, the action of most aniline dyes upon collodion seems to be to harden and toughen it, certainly not to make it "chippy," though perhaps such a result might be obtained with aurine. *That* fault is perhaps the last I should have expected to hear brought against collodion backing.

In the choice of a backing, as in most other matters, it is difficult to secure any conspicuous advantage in the way of efficiency without some counterbalancing conditions on the side of convenience, otherwise I should say an emulsion of chromate of silver in collodion would form an ideal backing. It is easily made, is cheap, as a very little silver goes a long way, is easily applied, and wonderfully effective, and would be automatically removed by the fixing bath, if left on the plate until that stage was reached; but the question arises as to the probable action of the chromic acid on the development of a gelatine plate *in a dish*. The chromate of silver would take to itself the bromide contained in the solution, as well as the bromine given off in development, and replace them by chromic acid, leaving the back of the plate coated with bromide of silver. How far the change would be beneficial, or otherwise, I am not prepared to say; but, as bichromate of potash has been recommended as an addition to the pyro-ammonia developer by Mr. Hanson, of Leeds, I think, possibly no great harm would be done. With collodion plates developed in the hand, this difficulty, if it be such, does not arise; for gelatine, the "bottomless" dishes, introduced by Mr. Warnerke some years ago, might remove it.—I am, yours, &c., W. B. BOLTON.

RED COLLODION BACKING.

To the EDITORS.

GENTLEMEN,—Your correspondents on the above subject do not appear to have noticed a peculiarity of the red collodion backing, as commercially supplied, which I have found to afford a very simple means of removing the backing from the glass, viz., after the final washing, if the edges of the plate be tried with the finger, it will be found that the collodion has frilled in places, and, by taking hold of the edge it may be stripped off in large pieces, aided occasionally by a stream from the tap; this latter will often float off nearly the whole.

My experience has only been with quarter-plates, and points to the fact that, the longer the negative is allowed to soak, the more easily will the backing come off. I first noticed this peculiarity with a plate that had been soaking all night, the collodion from which floated off nearly whole.—I am, yours, &c., SANCHO.

HALATION AND ITS REMEDIES.

To the EDITORS.

GENTLEMEN,—The subject of halation seems to be occupying some little attention just now, and as I have had considerable experience, of a gratifying nature, in respect of a remedy for it, I venture to offer a few remarks on the subject.

The solution I use for backing plates has been in constant use for six or seven years, and I am so satisfied with it that I would not change it for any other published process. I have given it the crucial test of *two hours'* exposure upon dark interiors of churches and cathedrals, with brilliant windows staring straight into the lens, without the least indication of halation, and the same tests, with shorter exposures, of twigs and leaves against a bright sky, perfectly clean and bright, and I do not think we need ask for any test of a more severe nature.

It appears to me that the desirable qualities of a "backing" solution for plates are:—

(1) Ease of application, with speedy drying, so that the plate may be put into the dark slide, soon afterwards, without sticking to, or making a mess with, its interior.

(2) Good keeping qualities (if the plates are stored away) without detriment to the film, and freedom from abrasion in the form of "dust," which is apt to get on the surface and cause pinholes, by holding back the action of light.

(3) Ease and celerity of removal, sufficient for development purposes, so that detail and density may be properly judged.

(4) That the colour quality of the backing and its "optical contact" shall be as perfect as possible.

I claim all these points for my "backing" solution, of which the following may be accepted as a good formula:—

Benzole, in which is dissolved sufficient *pure* indiarubber to give it a mucilaginous or sticky quality (don't try "vulcanised" rubber, because it is insoluble), this is to make it tenacious to hold the *powdery* colouring matter, which gives body to it, and to prevent it chipping off in dust under ordinary transit in the slides. To this solution add finely-powdered "asphaltum" until it is the consistency of *thinnish treacle*, so that it can be poured out of a bottle, and spread easily with a flat camel's hair brush.

Let me say, first, that the dark brown colour of "asphaltum" is very absorbent of such rays as pass through the gelatine film, and (what is considered of some scientific importance) that the "index of refraction" is said to be nearly the same as that of glass.

Now for the methods of application, and removal, which are the practical points of most interest to operators. I work on "11×9" plates, and therefore the method of work may be taken as a fair criterion; users of smaller plates will find it still easier.

Cover the working bench, or table, in front of the light of dark room, with sheets of blotting-paper, on which to lay the plates, face down, as coated, and, in front of operator, lay a square of *black*, soft material, such as velvet or mackintosh cloth, on which to lay, *face downward*, the plate to be "backed," as the black throws up the white square of the plate and renders the edges distinctly visible.

From the bottle of backing solution pour a small pool into the *centre* of the plate, and spread it as *quickly as possible* to the corners and sides of the plate with the flat brush, working it across and across to get evenness as long as the solution will *allow* you to do so, as it sets rapidly. Do not use more solution than is absolutely necessary to cover the plate easily, and the quantity to pour on will soon be arrived at by experience.

Lay aside this plate on the blotting-paper, face downwards, and proceed with others in the same way. By the time six have been coated the first is dry enough to go into the dark slide, but may still be "tacky," and it may be best to lay a sheet of tissue or other thin paper over the back.

My plan is to "back" a number at once—never less than a dozen plates, sometimes six dozen—and to store them away in grooved boxes.

If wanted for travelling purposes, I put them in groved boxes in pairs (face to face) for twelve hours or so to harden. Then they are quite firm, and will not stick to anything, and can be "packed" in any way desired.

Some one may say, "What a nasty mess to use!" If you stick your fingers into it, it is nasty; but if you do the work cleanly, and only touch the solution with the brush, it is perfectly clean and easy to manipulate.

Having exposed your plate, you now want to *remove* the backing *before* development, as nothing can be seen through it against any dark-room light. I know some users who fail to satisfy themselves, and make a mess of getting it off. Do not attempt it by "solutions" of any kind. Lay the plate, *face downwards*, on a sheet of clean blotting-

aper, take a *sharp* carpenter's chisel (one of an inch and a quarter or 1 inch and a half is a good size to use for a large plate, or a one inch r smaller ones), commence at one corner, and, with sharp edge, push ie film of backing off *in the direction of the centre of the plate*, just as if you ere "planing" it off. Keep the blotting sheet turned round as you pro- ed till you have been all over it, then sweep the stuff off into a spare ate box, wipe the *back* of plate well with a duster, and it is clean ough for *all purposes of development;* and what slight remains of olution is left on will do no harm to the developer.

The chief point of success in this part of the work is to have your nisel *as sharp as possible*, and take *care of your fingers* in using it. the stuff is properly made, it scrapes off the plate with a sort of cheesy" consistency in "flakes," not in splinters or powder, and preserved, and the operator studies economy very closely, it can e redissolved in fresh benzole and rubber, and used over again inde- nitely. The celerity of removal is such, with a good chisel, that I can lean off the backing from a dozen plates quite as quickly as I can coat nem, and I think that is quickly enough for anything.

There is a slight sticky residue left on the plate, and I find the easiest nethod of removing it is, after the plate has been fixed in hypo and lumed, to rub the back, whilst still wet, with a piece of rag or tow and ome powdered pumice stone, and swill the residue off under the tap. Dry he negative as usual, and, if any slight residue is left on the glass, a rag noistened with benzole will remove every trace, and leave the plate lean.

The subject of halation does not end with prevention by "backing" f the faults so glaringly visible in an unbacked negative; there is an nner and subtle quality about the *definition all over* a properly backed late which can only be appreciated by those who have used "backed" lates under every kind of circumstance, and it is a cure for the general aziness and indefinite quality of definition known as over-exposure, which is practically a kind of halation of *every overlapping portion of detail* in the picture. Taking "landscape" as an instance, where there are onsiderable varieties of distances, it will be found that over-exposure auses them to blend into each other at the edges, and is really halation f such lines, but backing the plate preserves these edges even in the most elicate gradations, and so preserves the over-exposed plate from the loss f these definitions; in other terms, it enables longer exposures to be given with impunity, and without loss of the delicate gradations which would be hopelessly degraded in an unbacked plate, and therefore is of immense importance in preserving *the purity of gradation of tone* in any photograph, and especially so in architectural work and interiors.

Now, I do not make this "backing" solution myself, I have plenty else to do, but I got my local chemist here to make it for me in the first instance, and he has experimented largely with materials, and his present make of solution is a considerable improvement upon my own as originally tried. His additions and improvements are his own trade secrets, but I can strongly recommend any one to give it a trial.

The solution can be "tempered" in such a way (to the desire of the user) that it will either dry very rapidly (two to three minutes) or, if the operator is not in a desperate hurry, it can be made to dry more slowly, say, ten to fifteen minutes, and is then more easily manageable in coating the plate, and it will dry with a more even and smoothly surfaced face.

The chief point to bear in mind as to comfort in using it is the method of removal by the sharp carpenter's chisel. It *must* be kept *very* sharp to be effective, a rough-edged chisel does not clean the glass so perfectly, and "rags" up the coating into small bits instead of broad "flakes." I can only say to your readers, "Try it," and I hope you will not be disappointed.

I have no interest whatever in the sale of the stuff, but it can be got at a very reasonable price, in bottles, of any size desired, from Mr. Joseph Young (photographic chemist), Gallowtree Gate, Leicester, and orders should state whether it is desired to dry rapidly or moderately so.—I am, yours, &c.,

GEORGE BANKART.

MOUNTANT PRESERVATIVES.

To the EDITORS.

GENTLEMEN,—I notice in your article on *Doubtful Mountants* you consider salicylic acid as probably harmless. I remember once using this acid to preserve a paste for attaching tissue paper to the studio windows, ordinary paste often showing mildew marks after a time in the damp months of the year. After a time, I found the paper turning a yellowish-brown wherever the paste had touched it, those portions that had accidentally escaped the brush remaining of the original colour. This change I attributed to the salicylic acid used, but did not make further experiments to prove the matter. It prevented the mould certainly.—I am, yours, &c.,

Penzance, Cornwall, August 13, 1897. ROBERT H. PRESTON.

THE YARMOUTH CONVENTION.

To the EDITORS.

GENTLEMEN,—It has been decided to present an album, containing a selection of prints from negatives taken during the late Convention, to Mr. Harvey George, the untiring Local Secretary, as a little souvenir of the meeting which his energy and tact did so much to make successful.

I have been asked to receive and arrange the pictures, and shall be glad if members desirous of contributing will kindly let me have *unmounted* prints not later than September 4.

To those who worked "binocularly," I should like to suggest that a parcel of stereos would, I feel sure, be also much appreciated.—I am, yours, &c.,

F. A. BRIDGE.

East Lodge, Dalston-lane, London, N.E.

MODIFICATION OF THE CALCIUM CARBIDE LICENCE REGULATIONS.

To the EDITORS.

GENTLEMEN,—We have pleasure in calling the attention of your readers to the new Order in Council dated July 7, 1897, whereby any person is now allowed to keep 5 lbs. of calcium carbide, *without a licence*, providing it is kept in separate 1-lb. tins.

We have been in communication from the first with the Home Office and London County Council with the object of obtaining some such concession, and consider we have been, at least partially, instrumental in convincing the Home Office that they originally took an exaggerated view of the supposed danger of acetylene gas and calcium carbide.

The photographer and lanternist will now be at perfect liberty to avail themselves of this ideal illuminant with practically no restriction, especially as the Fire Offices' Committee now allow portable generators and 4 lbs. of calcium carbide on insured premises. We have good grounds for stating that the Fire Offices' Committee will very shortly still further modify their regulations.—We are, yours, &c.,

THORN & HODDLE.

164, *Camberwell New-road, London, S.E., August* 11, 1897.

THE VICTORIAN EXHIBITION—THE LAKES FOR THE CAMERA.

To the EDITORS.

GENTLEMEN,—I cannot allow your article in to-day's JOURNAL on the Victorian Exhibition to pass without telling you that I have read it with great pleasure. It is full of practical knowledge, and serves to show what a beautiful process Daguerreotype was. In delineations no process of to-day has surpassed it. I am also pleased with Mr. Bolton's article, *Hypo Elimination.*

The grand old JOURNAL is well up to date. I have been away to the English Lakes with Mr. Lange and other photographic friends, including Mr. O. R. Green, of Richmond, London.

There are two professionals in Grasmere (Mr. Green and Mr. Petit) who turn out pictures, printed in platinotype, of great excellence. Now that the railways are accelerated, amateurs should avail themselves of visiting this lovely locale for the camera.—I am, yours, &c.,

JAMES ALEXANDER FORREST.

53, *Shrewsbury-road, Oxton, Birkenhead, August*, 1897.

DEMONSTRATORS.

To the EDITORS.

GENTLEMEN,—In America, when manufacturing firms and dealers bring out something new in photographic apparatus, materials, or appliances, I understand the travellers they send out are practical demonstrators, who can show photographers the most advantageous mode of using their goods. Here the travellers often know practically very little of the plates, papers, and appliances they sell, and I imagine, from conversation I have had with them, that very few of them could properly develop a plate or tone a print. With regard to apparatus, I will give you a case that came under my notice lately. In the early part of this year, a photographer bought an aerograph, thinking he could easily use it, but he found, without the necessary instruction, he spoiled his pictures in his attempts at colouring and working up. He was so disappointed at his failures that he advertised the apparatus for sale at half price, but the photographer who bought it had seen the company's representative work the aerograph at the Leeds Convention, and, in consequence of this slight instruction, is now turning out very good work. No doubt, in this case, had the original purchaser been lucky enough to have seen the company's demonstrator work the instrument, two aerographs would have been sold instead of one.—I am, yours, &c.,

HERBERT E. WATKIN.

Scarborough, August 16, 1897.

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—Herewith I beg to enclose an advertisement which appeared in your JOURNAL for Friday last, August 13. In common, doubtless, with many other applicants, I replied to this advertisement,

complying with the requests detailed therein, viz., I sent a courteous and business-like letter, giving details of my experience, photograph of self, finished specimens of all-round operating, retouching, printing, and toning, reference to last employer, and salary required, and fully prepaid the postage of same. To-day my photographs and specimens were returned, in the same postal wrapper in which I sent them last Friday, turned inside out, and for which I had to pay 3*d.* postage. I enclose wrapper for your inspection. No word or explanation of any kind was sent me, simply the photographs were returned, and I had to pay double postage to save my specimens. I don't know how the other applicants were served; but, if they were served in the same fashion as myself, I think the time has arrived when assistants should combine to put a stop to the insufferable arrogance and high-handed behaviour of certain employers.—I am, yours, &c., JOHN MAGEE.

76, *Haven-lane, Ealing, W., August* 15, 1897.

[We trust that the omission on the part of the photographer referred to by our correspondent was an accidental one.—EDS.]

REPLIES TO LETTERS.

To the EDITORS.

GENTLEMEN,—In a recent issue a letter appeared complaining of the delay which followed the dispatch of an order with which cash was sent; with this I entirely agree.

There is another point I should like to call attention to, and that is the non-acknowledgment of communications by firms, secretaries of exhibitions, &c. I always understood that it was the universal practice of business houses to reply the same day a letter was received, and that, when a full reply could not be given so quickly, a brief acknowledgment was sent stating this and promising details later. Unfortunately, houses in the photographic line seem strangers to these amenities.

Several days ago I wrote to a leading firm, and sent stamps for reply, as the matter was urgent, but have not even had a post card to state my "communication was receiving attention." I likewise wrote to the Hon. Secretary of an exhibition, asking to be furnished with particulars, &c., and enclosed stamp, with a like result.—I am, yours, &c.,

"BUSINESSLIKE."

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Joseph Smith, 4, Lansdown, Stroud, Gloucestershire.—*Photograph of two children crying, entitled "Sympathy."*

The Solotype Company, Lewes, Sussex.—*Photograph of group of the Mayor, Aldermen, and Councillors of the Borough of Lewes, Sussex. Photograph of group of the Mayor and Aldermen of the Borough of Lewes, Sussex.*

C. A. WAITE.—We do not offer such opinions as you ask for.

ORTHOCHROMATIC PHOTOGRAPHY.—R. W. C. Tailfer & Clayton's patent for the use of eosine in connexion with gelatine plates has expired.

BITUMEN.—WILTS asks where "extra-sensitive" bitumen is to be obtained in England? We believe it is stocked by Mawson & Swan, Soho-square.

INVERTED IMAGE.—F. B. WILLIAMS. We have nothing to add to our previous answer. The secondary image is produced by a pinhole, and is the same as that produced by the lens as to reversal.

TONING BATH.—D. Mc A. asks our "candid" opinion of the combined toning and fixing bath made with hypo, alum, lead, and gold? It is this: Don't use it, if permanence of the pictures is of any importance.

COPYRIGHT.—C. A. As it is not necessary to mark a photograph "copyright," you must not assume because the one you desire to copy is not so marked that it is not copyright. In all probability it is.

GILT LETTERING.—LEEDS. The mounts are not printed in gold, although the traveller may tell you they are, that is, if they are like the sample piece forwarded. Touch the lettering with a solution of nitrate of silver and see the effect.

OPAL PICTURES.—R. C. B. asks: "Which is the cheapest way to produce, in quantity, pictures on opal glass (porcelain)?"—The cheapest way is to use reversed negatives and print in carbon, working by the single-transfer method.

LENS.—OPTIC. A single lens, worked with an aperture of *f*-8, must not be expected to give crisp definition, even over a moderate area, let alone one equal to its focal length. Such a lens might be used for pictures of the "fuzzy" order, however.

W. BERRY.—1. Mawson & Swan, Soho-square. 2. A brush such as is used for pasting purposes would not hold so much, and would probably answer. 3. Spontaneously. Pizzighelli & Hubl's book gives considerable useful information on the subject.

STAINS.—CANADA. We have never met with spots like those described, but we may say that we are not at all in favour of acid fixing baths, especially such very acid fixing baths as that mentioned. When the spots are formed, no washing will get rid of them. Why not try the experiment suggested yourself?

ACETYLENE.—W. JOSEPHS. The new regulations, by the Order in Council, relaxing some of the restrictions with regard to the storage of calcium carbide, do not alter the regulations laid down by the insurance companies. They make their own terms, and are not influenced by any other body, Government or otherwise.

SPES MEA CHRISTUS.—1. Not if you cut off reflected side light by means of a cardboard aperture in the camera, as is frequently done in such cases. 2. No; the focus being about doubled, it is obvious that, with the same stops, the rapidity is halved. 3. Separating the components would have the effect of lengthening the focus. 4. Adopt the device mentioned in reply No. 1.

ALBUMEN PAPER.—B. RYLEY. The marblelike markings on the sample of paper enclosed are due to scum on the silver bath at the time the paper was floated upon it. The reason why the marks are absent after two or three sheets have been sensitised is that the former ones have taken off all the scum. After standing an hour or two in the dish, a used bath forms a scum on the surface of the liquid. That should be carefully removed by drawing strips of blotting-paper along the solution.

PAYMENT FOR HOLIDAYS.—ANNOYED writes: "Could you kindly give me an answer to the following:—Is it customary for photographers to pay their assistants for holidays, as my employer refuses to pay me for my holiday time, which by the way, is only six days; but, as I rely upon my wage, it means a lot to me?"—It is simply a matter of arrangement. Unless holidays are stipulated for at the time of engagement, an *employé* is not entitled to them as a right. Usually they are given as a matter of courtesy.

STUDIO.—S. COOK. Will you please be kind enough to give me the information as under, as I am building a studio twenty feet by ten feet? 1. Are three feet of glass sufficient to light the place? if not, how many feet will it require? 2. Should there be any glass at the opposite side or top? 3. Should the sitters sit with their back to the west?"—1. No. 2. Not necessarily. 3. In the afternoon, yes; in the morning at the east end. Our correspondent had better make, say, four feet at each end of the studio, top and side, opaque, and the rest glass.

PHOTOPHIL.—French lenses vary so much in quality that it is impossible to say if a 5×4, when stopped down, will cover a half-plate. However, wide-agle lenses by the best English makers, of four inches equivalent focus, will cover more than the half-plate size, and will give perfectly straight lines at the margins, supposing, of course, that the camera is rightly adjusted. You cannot do better than get one of them for the work you require. With such a lens, only one negative will be necessary. With regard to the plates, the one named might be an advantage.

VARNISH.—VARNISH asks: "Would you give me your aid to the questions: 1. I bought some varnish, called negative retouching varnish, which does not seem to dry, but the paper sticks a little to it. I use it in the usual way, and have never had this trouble before. 2. I have been trying to squeegee P.O.P. on glass and strip to give an enamelled surface, but the won't come off, neither with aluming nor without. Ought I to use anything to put on glass before?"—1. Probably time was not given for the varnish to properly dry. 2. Rub the glass well with French chalk.

ALBERT LÉVY (Paris).—1, 2, 3. The film to which reference was made is the invention of the Gem Dry Plate Company, of Willesden-green, N.W. It is termed the "A. C." (anti-celluloid). Doubtless the Company will send you a sample. We are in agreement with you as to the celluloid you mention 4, 5, 6. Probably the Zeiss *f*-18 lens (Series V.) might answer your purpose if diaphragmed down to *f*-50 or *f*-71; but it is very difficult to meet your requirements. A five-and-a-half-inch of the series mentioned is listed to cover an 8½×8½ plate at *f*-36. If we can supplement this information, pray write again. We reciprocate your good wishes.

RIGHT TO BUILD.—C. H. writes: "In March last I was granted a lease of premises with the permission, stipulated for in the lease, to build a studio on the top of the house. This I have done, and opened it. Now the trustees of the estate have served me with a notice to take the studio down within one month from date, as it contravenes the conditions upon which the original lease was granted to my landlord. Can I be compelled to do that?"—Yes, if it is really against the conditions of the original lease; but you can recover damages from your landlord who has granted you rights which were not his. You had better put the matter into the hands of a solicitor, if you cannot arrange matters with the landlord himself.

MEDALS.—MEDALS asks: "Shall I be doing right in exposing a man that is advertising 'Two Gold Medals awarded for Artistic Photography?' These are the conditions: A small Trade Exhibition was held here, and he had a stall, and was the only man who represented photography. Certificates, worth about 2*d.* each, were given to all stallholders. This man was not awarded a medal, but purchased a supposed-to-be gold one from a jeweller about 100 miles away for 35*s.* The second medal advertised he has not got at all. This man is also advertising 'Patronised by Royalty,' which is not so."—Such conduct deserves to be exposed, but, at the same time, we should hardly regard persons of this class worth troubling about. Thanks for the enclosure, which we shall utilise next week.

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EX CATHEDRÂ.

CORRESPONDENT has brought to our notice the annexed rcular, which is being issued by a country photographer: "In ccordance with our announcement last month, ———, photoraphers, &c. (to whom several medals for artistic photoraphs have been awarded at home and abroad), intend to ve a present to persons having a family group taken at their wn residence within the next two months, August 1 to ctober 1. These photographs will measure $8\frac{1}{2}$ in. by $6\frac{1}{2}$ in., nd will be mounted on cards 15 in. by 12 in., and finished in highly artistic manner. The price will be 15*s.* per dozen opies. The presents given with every dozen may be selected om our stock to the value of 7*s.* 6*d.*" A dozen whole-plate rints mounted on 15 × 12 cards from a negative taken at one's wn residence is assuredly cheap enough at 15*s.* without the clusion of a present worth 7*s.* 6*d.* (*sic*). This and other systems price-cutting among photographers never work the smallest dvantage to those adopting them; but, unfortunately, they ccasionally have the positive effect of reacting unfavourably n the businesses of other photographers. We have been roubled so little of late with circulars of the nature of that above-quoted that we were beginning to hope that price cutting among professional photographers was on the wane.

* * *

THE Eastman Company announce the discontinuance for the present of the publication of the *Kodak News*. The following paragraph occurs in the valedictory announcement: "It is not to be supposed that, in withdrawing *Kodak News*, we are relaxing in any sense our efforts to give the public early intimation and full descriptions of the new and improved photographic products, apparatus and processes that we are intending to introduce continuously. We shall simply add to our exertions in other directions, and vary our enterprise by substituting other avenues for coming into contact with those we desire to reach." *Kodak News* was always carefully conducted and full of useful photographic information and interesting pictures well reproduced.

* * *

IT may be remembered by many of our readers that, a few months ago, we had several references to a body styled the Institute of Photographic Artists, the prospectuses of which were circulated extensively amongst professional photographers, who were invited to become members. An examination of the credentials of this Institute rendered it at least doubtful whether the smallest benefit would accrue to those who were courageous enough to apply for membership. It appeared that the Institute of Photographic Artists was one of several associations promoted apparently from a common centre and by one group of persons, whose names appeared on all the literature of these bodies. A Society of Auctioneers, among others, was formed, and the failure of that society led to its forming the subject of inquiry in the Bankruptcy Court. We extract from one of our daily contemporaries the report of the resumed inquiry into its affairs.

* * *

THE inquiry into the failure of the International Society of Auctioneers and Valuers was resumed. The Society was registered as an unlimited company in November, 1895, for the purpose of providing an organization to promote the interests of auctioneers and valuers. The promoter, Mr. J. H. Wilkinson, was appointed President for twenty years, at a salary of 250*l.* a year, and under an agreement he was to be entitled to 5000*l.* by way of liquidated damages in the event of his being discharged on any ground other than that of mis-

conduct. Another agreement was entered into in March, 1896, under which Mr. Wilkinson agreed to retire and accept debentures of 500*l.* in lieu of the 5000*l.* Mr. B. A. Spaull, a Director, was called, and, in answer to Mr. S. Wheeler, Official Receiver, said that he joined the Board at the instance of Mr. Wilkinson. He did not know at the time that the Company was unlimited. He was aware that Mr. Wilkinson had promoted similar institutions for the benefit of other professions. Personally, he had no interest in the Society, and was not even a member. He was told that there would be 2000 members, and that, if a less number joined, the terms would be modified. Three prospectuses were issued, but the fact that the liability was unlimited was not disclosed except by the omission of the word "limited." The payment of the 5000*l.* to Mr. Wilkinson was spread over a period of ten years.

* * *

Mr. H. F. McDowell said that he was appointed Secretary of the Company by Mr. Wilkinson. He was then in his twenty-second year. He believed the Company was registered under the Act of 1862, but he did not claim to be a company expert or specialist. If any member had come to him and asked if his liability was unlimited, he should have told him that it was, but as a matter of fact no member did make the inquiry. The Registrar: Do you think it likely that persons who were paying a guinea or two a year for membership imagined that they might be making themselves liable for thousands of pounds? The witness said that the Society was not intended to be a trading company or incur liabilities. The Articles of Association could be inspected at Somerset House or at the Company's office. He resigned in March, 1896. Mr. Luwee Harris, the next witness, said he was an architect. He was not an auctioneer or valuer, but he was asked by Mr. Wilkinson if he would like to become a director. He did not admit that he was appointed by Mr. Wilkinson, but by the signatories. He did not know the latter, nor they him, and he could not explain how they could have selected him, unless at the instigation of some other person. He was not aware that the Company was unlimited until the early part of last yeart. He became President of the Society in succession to Mr. Wilkinson. The Society then consisted of fifty members, but he hoped to be able to increase the number.

* * *

Two of the names of persons that figure most prominently in the foregoing report as having been concerned in the promotion of the Society of Auctioneers and Valuers also appear on the prospectus of the Institute of Photographic Artists, namely, J. H. Wilkinson and Luwee Harris. We should be glad, should any of our readers have recently received communications from the Institute of Photographic Artists, if they will kindly communicate with us, as we are anxious to give the Institute the fullest publicity among the photographic profession. If any of the latter have become members of the Institute, it appears probable they have accepted the position of shareholders in what is virtually an unlimited liability company.

MERCIER'S PROCESS FOR ELIMINATING HYPOSULPHITES.

The full account of this process, which was published in our last issue (page 538), suggests some curious questions as to what are the supposed functions of the individual ingredients employed, and of the formula as a whole. It will be noticed tha one of the methods of procedure "may" consist in the use o an alkaline iodide alone, M. Mercier having "discovered" tha these salts "decompose argentic hyposulphites to a far highe degree than the alkaline chlorides, such as common salt, which latter is mentioned as having been previously recom mended as a "dialytic eliminator." Surely this statement in volves a remarkable misapprehension of the respective action of the soluble chlorides and iodides in the presence o the hyposulphites of silver, whether in the soluble or insolubl form. It is true that common salt has been used or recom mended in the manner mentioned—as a dialytic agent, *i.e.*, t assist in the diffusion of the salts out of the film; but, in thi country at least, it has never been regarded in the light of *decomposing* eliminator, and, that being the case, if it has an beneficial action, which is doubtful, it may be regarded a perfectly safe.

It is well known that the soluble chlorides, or even hydro chloric acid, exercise no action and form no precipitate wit solutions containing silver in the form of hyposulphite, an therefore salt, when applied to a negative or print, at leas does no harm; but, if to a solution containing hyposulphite o silver a soluble iodide be added, it will result in the instan formation of a copious precipitate of iodide of silver. Th reason of this difference is to be found in the far higher degre of solubility of chloride of silver in hyposulphite of soda tha the corresponding iodide, from which it results that, if chlorid of silver be formed on the addition of salt to a solutio of argentic hyposulphite, it is at once dissolved and held i solution by the sodium hyposulphite formed in the decompo sition. But when iodide is substituted, owing to the far lowe degree of solubility of the silver iodide, the hyposulphite o soda formed is incapable of holding it in solution, and it i consequently thrown down. A similar action occurs when bromide is used, though in a modified degree. The sam changes that proceed in the case of the solutions will als occur when plates, films, or papers containing hyposulphite o silver, are treated with a soluble iodide, and the silver will b precipitated in the form of iodide, and, so far from bein "eliminated," will be permanently located unless again treate with sodium hyposulphite. For the purpose of testing whethe a plate had been sufficiently fixed, we proposed in thes columns some few years back the very process that M. Mercie now recommends for eliminating the argentic hyposulphite but how the latter function is to be reconciled with the fact we have stated we are unable to say.

In the case of common salt, if a plate had been insufficientl fixed, and contained traces of the insoluble form of the doubl hyposulphite of soda and silver, it is probable the salt woul act beneficially by converting it to the soluble form; it would, i fact, complete the fixing that had been left undone by th hypo, but it would not in any way, except by increasing th rapidity of diffusion, lessen the usual washing. With iodide however, employed in the same manner, the insoluble sal would not be rendered soluble, but converted into iodide o silver, as has been shown. Further than this, although bot common salt and alkalies more or less tend to convert the in soluble argentic hyposulphite to the soluble condition, in th presence of a soluble iodide, the iodide of silver would still b formed, owing to the fact we have already pointed out tha there is insufficient sodium hyposulphite formed to hold th silver iodide in solution. We cannot, therefore, see how th proposed method of "elimination" is to be of any practical use

THE SWING BACK IN COPYING.

NCE we wrote last week on this subject we have had what we gard as a singular corroboration of the accuracy of the rmise that, in order to secure correctness of proportions well as vertical uprights, both negative and copy should be clined at the same angle as the original "tilt" of the camera. will be remembered that in correcting the distorted chess-oard diagram the two surfaces were measured as set at 1° each, whereas the camera was tilted at $12\frac{1}{2}°$, and, arguing n Mr. W. H. Wheeler's suggestion of the use of a lens of half ne focal length of that originally employed when copying to ne same size, we thought it possible that we might have mis-neasured the angle at which the camera was tilted. But we ad overlooked one important circumstance, namely, that, when he original diagram was made, we were working at com-aratively close quarters, and were therefore not dealing with he principal or equivalent focus of the lens, as in the case of distant view, which is the condition that would require a lens f half the focal length if the plate only were inclined in opying or both negative and plate inclined to the same angle t the original tilt if the same lens were employed. As a natter of fact, the distorted photograph was a reduction to *one-ighth*, and therefore, using a lens of $8\frac{1}{2}$ inches focus, the actual amera extension or shorter conjugate would be $9\frac{9}{16}$. If, now, we make a rule-of-three sum of it, we shall find that, working on Mr. Wheeler's principle, the proper angle at which the diagram and its copy should be sloped is exactly $11\frac{1}{9}°$. This, we take it, fully confirms our previous deduction that, with an ordinary architectural photograph and using the same lens for copying, we shall be near enough the mark if negative and copy be each inclined at the same angle as the camera. If working at sufficiently close quarters to *materially* alter the camera extension, then it will be necessary to measure that and make the necessary calculation of the angle.

Silver. Further Fall.—The record of the low price of silver has again been broken. On Friday last it was quoted on the market at $24\frac{1}{16}d.$ per ounce. It is possible that this abnormally low price will lead to the closing of some of the mines, as it is said that some of them will not pay to work with silver at less than two shillings an ounce.

More X Rays.—At one of the meetings of the British Association at Toronto, one day last week, Professor Thompson gave an address on new varieties of the X rays, and announced the discovery of four new rays. As many of our readers will be interested in the matter, here is how they are described: One is of an orthokathodic character, a deflectible fluorescifient excitant; one is of a parakathodic character, a defectible fluorescifient excitant; another is of a diakathodic character, a non-deflectible fluorescifient non-excitant; while the fourth is of an isokathodic character, a deflectible non-fluorescifient non-excitant. Röntgen's discovery has had many developments, and has been put to many uses, and one naturally wonders where they will end, or whether they would have received the wide-spread attention they have.

Simple but Efficient Improvement in Crookes' Tubes for X-ray Work.—Mr. J. Wimshurst, so well known in electrical matters, writes to *Nature*, explaining the chain of reasoning which led him to devise an important improvement in the Crookes' tube, to prevent or remedy the well-known tiring action, and the consequent irregularity of results. He coats the cathode end of the tube with tinfoil, leaving about a quarter-inch gap between the cathode terminal of the tube and the tinfoil. "The behaviour of the tube is now much affected—formerly it was uncertain when used with a six-inch spark length and required frequently heating. With the tinfoil coating the tube illuminates with certainty, and with a much shorter spark length."

Another Jubilee Exhibition.—It is stated that next year the Emperor Francis Joseph's Jubilee is to be celebrated by an Exhibition in Vienna. It is intended to illustrate, in this Exhibition, the progress made in Austria during the last fifty years in arts, sciences, horticulture, agriculture, and manufactures. Of course the progress of photography will be one of the features of the show, as Austria has made great advances in this direction, particularly in photo-mechanical work. It is announced that special efforts are being made to prevent the Exhibition being of interest only to specialists, or of its degenerating into a mere fair. From the wording of the notice, we imagine the show is to be confined to native productions, and is not to be of an international character.

Small and Large Apertures in Astronomical Photography.—Dr. Isaac Roberts some little time ago published in *Knowledge* his experiments regarding the probable limit in the length of the time of exposure for astronomical photography. His experience led him to believe that there was a limit beyond which further exposure could give no additional gain, owing to the fact that there was enough luminosity in a dark sky to produce a deposit on development that would obliterate any star image of very small magnitude. Professor F. L. O. Wadsworth, however, is inclined to disagree with these opinions, as he finds that, among others, the two most important factors in the matter are, first, the brightness of the sky, and, secondly and most important, the angular aperture and diameter of the lens used.

The Brompton Boilers.—One of the first outcomes of the preliminary report of the Committee appointed to inquire into the administration of the Science and Art Department will be to rid South Kensington of its greatest eyesore—the "Brompton boilers." The report of the Committee as regards the great risk of fire, and the destruction of the valuable contents of the building, has been the means, or will be, of getting rid of these unsightly sheds. They are to be demolished at once. It is a wonder that such hideous structures have been permitted to disfigure the neighbourhood so long, and it says but little for either *art* or *science* at South Kensington that they have, seeing the amount of money the department annually receives. It is to be hoped that the Committee's complete report will be the means of still more important reforms in this department.

Reduction in Exposures.—In *La Nature* is an article by G. H. Nieuenglowski on Captain Colson's method of reducing the time needed for correct exposure. He explains how, under ordinary circumstances, a certain amount of light passes through the film without being utilised, and the question is, How is this unused portion to be brought into action again so as to diminish the time needed for exposure? The answer is: Place behind the film (the plate thus requiring to be reversed in the dark slide, and consequently taking a reversed picture) some reflecting surface placed in close contact; a piece of white cardboard answers. The drawback to this method is the need of specially good and clear glass. It is therefore preferable to use Mr. Colson's plan—to place a white substratum on the glass before coating with emulsion. This substance must at least be far less sensitive than the gelatino-bromide, and be capable of being easily rendered transparent for printing purposes. It is anticipated that then, for a variety of subjects, a good image will be developable under what would ordinarily be insufficient conditions. It is further shown that these recommendations of Mr. Colson go to prove the correctness of the statements made some time ago by M. Balagny, that emulsion spread on paper is quicker than a similar coating on ordinary glass.

Artificial Light: Modern Methods Compared.—Professor D. S. Jacobus recently delivered before the Franklin Institute a lecture on this topic, which forms one of the most valuable *précis* of the arguments for and against the various modern methods of artificial illumination yet put together. An abstract, which appears in the current issue of the *Chemical News*, forms the source of the few extracts which we give for the benefit of those of our readers who take a special interest in this subject, of prime importance in photographic technics.

Acetylene.—We see that acetylene gives ten times as much light as ordinary illuminative water gas when burned in an ordinary flat-flame burner and about three times as much when the latter is burned in a Welsbach burner. The percentage of the total heat of combustion of the gas transformed into light is also greater for the acetylene than for the ordinary illuminating gas. For a given illumination the atmosphere is vitiated by the carbonic acid formed in burning the acetylene to a slightly less extent than when burning ordinary illuminating gas in a Welsbach burner.

Explosibility.—Acetylene mixed with air is more explosive than either hydrogen or coal gas; but, as the burners for the former are so much smaller, the accidental leaving open of a tap would cause less danger through the small amount given off, though here again the result has to be qualified by the consideration that, acetylene being so near in density to the atmosphere, it would not diffuse so rapidly, but would tend to accumulate in the neighbourhood of the leakage. It will also at about two atmospheres' pressure explode by a spark or contact with heated platinum wire though no air be admixed. The same with the gas in a liquefied state.

Comparative Costs.—In New York the cost per hour for the production of 16-candle power of light is as follows:—

		Cents.
Incandescent electric light		1·0
Illuminating water gas.	Ordinary 4 ft. burner at 1·25 dollars per 1000 feet	0·5
	Welsbach 1·14 ft. burner at 1·25 dollars per 1000 feet	0·17
Acetylene employed for municipal distribution.	Calcium carbide, converted into gas at 40 dollars per ton to replace ordinary burners	0·5
	Calcium carbide converted into gas at 19·5 dollars per ton to replace Welsbach cost of renewing mantles included	0·17

Thus, for acetylene to compete with ordinary gas at 1·25 dollars per 1000 ft., the carbide would have to be bought (and converted into gas) for 40 dollars a ton, or, if set against incandescent burners, for 19·5 dollars.

Gas *versus* Electricity.—To be as cheap an illuminant as electricity, gas must be made with power and attendance costing half as much as electricity. For equal illumination the incandescent electric light costs twice as much as gas burnt in flat-flame burners, yet it has held its own, thus giving proof that other elements enter into the cost of artificial lighting as strong as the cost of a given amount of light. From this standpoint it may be argued that, acetylene, producing as it does a more brilliant light than any now used for interior lighting, of having the quality of showing the complexion in lifelike tints, will have its own field, even should it be the most costly style of illumination.

The Arctic and Antarctic Expeditions.—There is still no really reliable news of the Andrée Arctic Expedition. According to telegrams from Christiania, the captain of a Hammerfest fishing vessel has shot a carrier pigeon bearing the message, "Passed 82° latitude, with good voyage northwards, Andrée;" but, unfortunately, no date could be deciphered. This message may be a little dubious, as it was received in a very indirect way—signalled and passed on from different ships. According to a Reuter telegram the Skien Journal, *Fremskridt*, in a dispatch from Sande in the Telemark, states that a balloon was seen moving in a north-westerly direction, and at a great height. It adds that there was some tackle depended from it which appeared at the distance to be "luminous." For the present all the "intelligence" received seems open to doubt.

The north pole has of late years been receiving nearly all the attention at the hands of polar explorers, but now the south pole is to receive some notice. On Monday, last week, the Belgian Antarctic Expedition started from Antwerp; but, unfortunately, it had a rather bad beginning, as the vessel—the *Belgica*—had to be put into Ostend on Wednesday in consequence of a breakdown in her machinery and the rough weather met with in the North Sea. The expedition is led by M. de Gerlache, and he is sanguine of reaching the pole. If not, he hopes to carry out many important scientific investigations. Of course, as in all modern expeditions, whether polar or other, photography is to play an important part. The *Belgica* will be accompanied as far as Liefkenshoek by the *Emeraude*, having on board a number of scientists who are interested in the expedition. It is expected that the expedition will reach Grahamsland early in December. The vessel is provisioned for two years. With the different expeditions, present and prospective, it will be interesting to see which, if either, pole is reached first, and by what nationality.

Weather Forecasting.—At the meeting of the Academy of Sciences in Paris, last week, Dr. Zeuger, of the Academy of Science of Prague and Professor at the Prague Technical University there, was warmly congratulated by the meteorologists on the correctness of his weather forecasts for the first half of August, based upon the sun spots. The forecasts for the last half of the month are as unfavourable as for the first half. The Professor tells us that they must expect heavy storms of rain with violent wind, inundations, with a great fall of temperature, in the east of France, Alsace, the Alps, and the eastern portion of Austria, while other regions such as Italy are to have a fortnight of torrid heat. The Professor's forecasts for September, however, are a little more favourable; still he predicts frequent storms and heavy rains in Austria-Hungary, England, the south of Germany, and the north of France, particularly during the latter half of the month.

It will be interesting to note the correctness or otherwise of Professor Zeuger's predictions, and whether they are any more reliable than have been others that have been issued so long beforehand. One portion of them—that referring to England—will probably be fulfilled, as during the latter part of the month, about the time of the equinox, the weather is generally very unsettled here for a time, and but little knowledge is required to foretell it. If the Professor can foretell the weather so long ahead, our Meteorological Office should take a leaf from his book, for we all know how very unreliable are their twenty-four hour forecasts, unless, indeed, the weather is in a very settled state.

The Lay Press and Photography.—We have frequently given instances of the curiosities exhibited by the lay press in dealing with photographic matters, but the latest is one of the best, since the opinion is expressed as ex cathedrâ. A correspondent writes to one of our contemporaries to say that he has discovered newspaper print on the albumen of a hard-boiled egg. On holding the egg to a looking-glass, the letters being reversed, they became perfectly legible. Our contemporary is one of those organs which give advice on any and every subject under the sun; nothing is too much for them. From literature to finance—from fine art to philately, and from horses, dogs, pigs, and poultry, to cockroaches, they will answer any question you like to ask. An append to the above letter appears (and, as it is signed "Ed," we presume it is authoritative), in which the statement is boldly made, "We expect

ıe printing on the egg is due to some photographic action and lectricity combined, *for the characters were reversed.*" The italics re our own, as the words imply such an apparent *non sequitur*, and he paragraph closes with the following, "It would be an interesting ubject for experiment by any one having a taste for photography in vhich albumen is so much used."

THE correspondent who sent us the clipping, and who himself eeps poultry, writes, "I expect some of my eggs have got into that oker's hands. A lot of my hens are very fond of old gelatine films nd print trimmings, and during the recent hot weather they have een constantly quenching their thirst in a pool where my print washings go to. I tried to stop them, but, as I found it did them no ıarm, I let them go ahead, little dreaming they were sensitising their own albumen! Now I have got the tip, I shall work it out to the nd instead of going to Klondyke as I intended." We should recommend our friend to go to the far west, just in order to obtain a store of material to render the home-sensitised albumen self-toning.

JOTTINGS.

OF the Diamond Jubilee that has just been celebrated we have all heard enough, no doubt; but it is probable that in photographic circles, during the next year or so, the phrase, hackneyed though it be, will constantly crop up, for photography itself will shortly have a Diamond Jubilee. In 1899 sixty years will have elapsed since Daguerre and Fox Talbot produced photographs by the processes respectively associated with their names, and such a fact will hardly escape recognition in print, although anything in the shape of a special commemorative celebration cannot be, for obvious reasons, looked for. When the centenary arrives, our children will possibly have a fine chance to signalise the event, and, in the mean while, what photography will be in 1939 offers a pretty theme for a little dreaming and imagining.

The Great International Photographic Exhibition that is to be held in April next year at the Crystal Palace will fall nearly at the completion of photography's sixtieth year of existence. Thus, practically speaking, an opportunity of fittingly celebrating the Diamond Jubilee of Photography has been provided beforehand. The International Photographic Exhibition of 1898 will have features that will entitle it to universal support. It aims to be representative and comprehensive. It appeals to the professional photographer, the manufacturer, the dealer, to the picture-maker and the technician, to the experimentalist and the man of science, to amateur as well as professional, to the process-man and the lover of historical photographs, to the representatives of every industry and profession in which photography plays a part. For the very first time, an organized and energetic attempt is to be made to bring together, under one roof, a display which shall be completely illustrative of what modern photography really is. The work is in the hands of the Royal Photographic Society, backed up by the ablest men in the principal branches of photography. The Exhibition is not a commercial speculation, and will be the concrete expression of an earnest wish to benefit British photography in its threefold aspect of an art, a science, and an industry.

I have been harping on this theme for over a twelvemonth, so that in all probability I have repeated myself; if so, I trust the reader will forgive me. My interest in the subject must be my excuse. A representative photographic exhibition has been badly wanted for years past. The commercial attempts to meet the case have uniformly been ghastly failures, and the record of what was done in the matter at the Aquarium, the Crystal Palace itself (as a business speculation), the Agricultural Hall, and other places, is dismal reading indeed. What was needed was an exhibition organized *by* the trade *for* the trade. At last, on the initiative of the Royal Photographic Society, we are to have it. Then, as to the purely photographic section, what is called "pictorial" photography has long had every prominence given to it, but technical and professional work in all its many divisions and subdivisions has been cold-shouldered—so much so, that non-"pictorial" photographers have openly wondered whether their chance of taking part in a representative exhibition would ever come again. All this and more will be set right by the Royal Photographic Society next April. I ask all those having the prosperity of photography at heart to support the Exhibition, and so encourage the Society in its laudable work.

I was deeply sorry to read of the passing away of poor W. H. Harrison, although in his terrible state of health his death was, indeed, a happy release. In the course of thirty years' work in photographic journalism many useful ideas flowed from a pen that was always facile, graceful, and well informed. When a history of photography that is the outcome of a careful and unprejudiced study of the subject comes to be written, prominence will surely be given to the fact that as long ago as 1868 Harrison published an account of some experiments with gelatine as a vehicle for the sensitive silver salts. But for his own modesty in the matter, Harrison's name would have been much better known in connexion with early experimental work in gelatine than it is. Very few people knew how attractive and interesting Harrison could be in congenial society. Fate and some of his journalistic contemporaries were none too kind to him, but he took misfortune and disappointment like a thorough Stoic.

Lens matters are receiving considerable attention just now, a fact which is not surprising having regard to the gradual manner in which the anastigmats are slowly forcing the older types into the background. Nowadays so much importance is attached to the subject of the covering powers of lenses that Mr. M. J. Michael's reminder on p. 363 (June 4), as to the true way in which the angle included on a plate should be measured, is exceedingly well timed. Mr. Michael points out, by the aid of a simple illustration, that the angle should be measured along the diagonal and not the base of the plate; to quote his own words, "the circle of illumination given by the lens must have a diameter equal to the diagonal of the plate and not only equal to the length of the base." Clearly all tables of view angles in which the result is obtained by dividing the base line of the plate by the focal length of the lens are inaccurate. I think it was Mr Everitt who some years ago, in several papers and articles published in the JOURNAL and ALMANAC, maintained that the view angle should be measured along the diagonal. It is surprising that, until Mr. Michael wrote on the subject the other day, nobody appears to have appreciated Mr. Everitt's point.

The battle of the lenses that is obviously being fought is not a contest of old *versus* new, but one in which the competing objectives are entirely of modern construction. I sometimes wonder, when rival lenses are being subjected to comparison, why it is that the Kew test is never invoked to settle points in dispute. When, some five years ago, Major Darwin, at the Photographic Society, read an exhaustive paper descriptive of the system adopted at Kew for testing photographic lenses, great expectations were formed of the immense use that would be made of the facilities that were to be cheaply offered for ascertaining the qualities of a lens; but opticians and lens-users do not appear to have troubled the Kew authorities much. Why is this? The Kew method, so far as I know, has not been unfavourably criticised, and, on paper, it appears to have the most scientific exactitude. It would be interesting to know why it is ignored by those for whose benefit it was devised.

The slump in society meetings that for some years has characterised the summer months has this year reached a most acute stage. For weeks past the reported meetings of societies have been fewer than at any time during the last decade. Since "demonstrating" went out of fashion among the trade houses, the difficulty of filling society programmes has been very keen, and thus the available talent is soon exhausted, leaving an empty cup-

board for the summer. Again, photography to-day is different from that of the eighties. It has fallen into a settled groove. No vital process is on its trial, experimentalists are decreasing daily, and elementary photographic literature exists in abundance. The talkers of ten years or more ago are the busy manufacturers of to-day, with no time to waste at society meetings. To employ an American locution, photography does not "pan out" as a subject for discussion so well as it used to, and therefore it is nowadays practically impossible to sustain interest in society meetings during the summer months. Such being the case, photographic societies do well to adjourn during the summer, and husband their resources for the autumn and winter.

M. Demachy's criticisms, on pp. 485 and 502, dealing with the English photographs sent to the Paris Photographic Salon, obviously emanate from a qualified critic, although here and there he "reads into" the photograph of which he writes qualities which few eyes besides his own possibly could discover. For example, Lionel Bennett's exquisite joke of a *Telegraph Post* gives M. Demachy the impression of the most absolute dreariness and desolation! M. Demachy is aware that many people consider this post ridiculous—I believe that the author is among the number—so that he is to be complimented on his courage in praising it. Clearly, if a photograph of a telegraph post can suggest dreariness and desolation, there may be "pictorial" possibilities in a birchbroom, a copper stick, or a haystack. Accept these suggestions with the assurance of my most distinguished consideration, Mr. Bennett, and let us see how you have availed yourself of them when the Salon Exhibition opens. Some of the other photographs, which M. Demachy highly praises, were flukes at which nobody was more surprised than the producers, and the opinion in general that he holds of English "pictorial" photography is much more exalted than that which is held of it here, except by those who have most reason to think well of it.

It seems to follow as a matter of course that, after each Convention meeting, considerable grumbling should be indulged in. This year has proved no exception to the rule, and the microscope has been vigorously applied to the whole of the proceedings. Every little hitch or fault has been magnified, and no part of the programme has escaped unfavourable criticism. If the fault-finders are sincere, it is to be hoped that they will not fail to lay their views before the executive, so that improvements may be made where they are found necessary. With all its drawbacks, the British Convention is immeasurably ahead, in some respects, of that annually held in America. The latter is simply a vast advertising carnival and medal-distributing agency, and, were it not for the reports in the American photographic press, I would not have conceived it possible that so much windy gush, so much high-falutin' rubbish about photography and art could be spoken and listened to at a gathering of photographers as was done during the American Convention just held. The scenes in *Martin Chuzzlewhit*, in which Dickens satirises American oratorical methods and peculiarities, are dry and sober reading compared with the amazingly strange and comical things talked to American photographers in Convention assembled. What do my readers think of this as introduction to a disquisition on art?—

"How long do you want me to talk? We will leave that to you. When anybody gets tired, yawn and I will quit. I think I am one of the laziest men that walks and I am always ready to stop. Art is the embodiment of the senses; it is the higher feeling, it is the development of a temperament, it is the development of something that is better and nobler. The dividing line between the senses, let them be in the higher plane or in the lower, is very narrow, extremely narrow. We step from the lowest depths of despair and from the very lowest depths of discouragement, from the dark clouds of the valley into the sunshine of encouragement and enlightenment, and the border line between these two lands is extremely narrow. Show me the man that is so wonderfully developed that he sees and feels the best things, and I will show you a man who is equally variable in his nature, so that he easily steps down into the lowest depths."

This is a fair sample of the intellectual fare upon which American photographers apparently thrive!

The Dansac-Chassagne colour process comedy has broadened ou into screaming farce. Could anything be more diverting tha Messrs. Anthony's experiences? They billed America with th announcement that the solutions would be on sale on July 1. Th solutions arrive, but no results are obtainable. A demonstrator i cabled for from Paris, and, when *he* arrives, he also fails to produc a result. So the curtain is rung down on a highly amusing act What is to happen next? Really, it is all very funny, and I am sure that everybody will allow the process, despite its scientific failure, to be productive of a great deal of amusement, which is some thing to its credit, at any rate.

But what of Mr. Bennetto? A year ago I wrote that the eyes of Europe were on Newquay. They have been anxiously turned in that direction ever since. "How long, O Lord, how long?"

COSMOS.

AMERICAN NOTES AND NEWS.

The American Convention.—The American Convention, which met at Celeron during the week July 12–17, appears to have attracted a considerable attendance of professional photographers. There was a great deal of characteristic discussion on art and kindred matters, and a competitive Exhibition at which innumerable awards were made. According to one of our exchanges the creature comforts of the visitors were well looked after. "The entertainments provided by the citizens of Jamestown for their guests deserve special mention," it states, "and the efforts of the committees having them in charge are to be highly commended. On Monday evening an informal reception was held at Greenhurst, which was very largely attended, and which served to put all upon a footing of acquaintance and familiarised the new comers with their surroundings. On Tuesday evening all members and their accompanying friends were entertained at the new theatre, and on Wednesday evening, under the auspices of the manufacturers, the grand illumination of Hotel Greenhurst took place. The scene was one of great beauty, with its thousand lanterns, its beautifully decorated steamboats and small craft, and the truly magnificent display of fireworks that was provided. On Thursday the entire afternoon was devoted to a trip up the beautiful lake, a stop for refreshments, a game of baseball and several races, and the evening was filled by an exceedingly attractive programme of music and entertainment at the Jamestown Opera House. On Friday evening occurred the grand ball at the Waldmere Hotel, given by the Demonstrators, which was fully attended, and was a pronounced success. Saturday evening was given over to informal receptions and good-byes, and with the week closed a most enjoyable Convention from a social standpoint."

The Late H. H. Snelling.—*Anthony's Bulletin* records the death of this veteran photographer. He was one of the oldest, and at one time one of the best known workers in photography in the United States. He died at the Memorial Home, St. Louis, June 24. Mr. Snelling was born in 1817 at the Military Post at Plattsburgh, N.Y., where his early life was spent. After completing his college education at Georgetown College he drifted into photographic work, and in the early Daguerreotype days was employed in the chemical department of Messrs. E. & H. T. Anthony & Company, during which time he published a journal under the title of *The Photographic and Fine Art Journal*, about the year 1851. About this time he became blind, but his interest in photography and editorial work still continued, and his contributions to photographic literature were quite voluminous. He was a man of more than ordinary literary attainments. Mr. Snelling had been an inmate of the Memorial Home since 1893.

The Photographic Trade in New York.—This appears to be in an extremely flourishing state just now. The report from several of the prominent photographers of our city, says *Wilson's Photographic Magazine*, may be summarised in a few words: They have experienced a much busier season (December to May) than was anticipated. There has been a fairly large demand for the better grades of work; matt-surface pictures, carbons, and platinotypes are

received with increasing favour, despite their higher prices; and there is an encouraging tendency to greater frequency of orders for large and important work. The old-established galleries have apparently held their own in a satisfactory way, although several new men have entered into the field and pushed business after a lively and successful fashion. One firm, after only five years' growth, showed with pardonable pride a year's salary list amounting to almost $30,000. A new studio has been established for children's portraiture exclusively, and another will double its prices for its speciality at the opening of the fall season. These facts are surely encouraging, and the other fact, that the minds of many are set on better prices, shows at least a more hopeful spirit. Business men don't talk of higher prices save on a rising market. May this new spirit grow!

An Ideal Printing Paper.—This is the title used by Mr. Maxmilian Toch, in referring to Velox, an American bromide paper. Says Mr. Toch, in *The Photographic Times*, "Velox Carbon is called the paper of the future, and, as I have used every paper ever put on the market, I abandoned them all, even the use of platinum, for it. I expose Velox carbon to an ordinary 16-candle power gas flame for thirty seconds, about ten inches away from the flame, and keep the printing frame moving all the time so as to get a uniform impression. I then take the paper face up and put it in a wet tray, and paint the film side with a mixture of—

Amidol	60 grains.
Sodium sulphite	1 ounce.
Water	16 ounces.
Potassium bromide	1 grain.

All this I do by the same light about ten feet away from the gas, and sometimes I have a candle burning a foot away from the tray. The picture comes up instantly, and after noting that it is uniform—for, if it be not entirely uniform, I keep brushing the developer on the uneven parts—I plunge it face down in the acid hypo bath, and keep it moving for a few seconds, and the operation with the exception of subsequent washing and mounting is done. The developer I use gives intense blue black prints, in every respect equal to platinum. Two things are necessary for absolute success with Velox carbon; first, the use of distilled water; second, cleanliness. It is necessary to become ambidextrous in order to have good results. I use the right hand for handling the paper, and for brushing on the developer, and I use my left hand for moving the print in the hypo. I drop the print with the right hand into the hypo, and then use the left hand for plunging and continued motion, after which I wash the left hand in a small dish of acidified water, and go on with the next. The whole process becomes mechanical in a short time, and the resulting prints are all that can be wished for. Sometimes I make over three dozen an evening, and, although the makers do not advocate extensive washing, I find that, where the acid hypo bath contains plenty of alum and is fresh, the prints do not suffer from being in the water all night. The glossy Velox is admirable for those who like glossy prints. I have used it to some extent, but I prefer the Velox carbon."

Velox Paper.—On the same subject as the foregoing Mr. W. H. Walmsley, of Philadelphia, writes us further in reference to Velox paper, which we noticed some months ago, on account of its suitability for printing photo-micrographs. Mr. Walmsley says: "I have received a copy of the JOURNAL sent, and notice paragraph therein anent the Velox print sent you. I have not a copy of my note to you which accompanied them, but am under the impression that you have omitted, in the latter portion of your comment, a very important comparison, which I certainly *intended* making between the time required for printing this paper by the acetylene and oil lights. Did I not send two prints from the same negative, the one having required some four *minutes* of exposure to the oil light, whilst the other was fully printed by acetylene in about as many *seconds?* I wished to call attention not alone to the merits of the Velox paper for printing photo-micrographs, but also to the eminent usefulness of acetylene as the illuminant. The Velox is really a remarkable paper. It may be handled and manipulated with absolute safety by any ordinary oil or gas light, or even by subdued daylight; yet it sometimes is sufficient to permit fully timed prints to be made from negatives of average density in a few seconds by acetylene, or three to five minutes by coal, oil, or paraffin lamp, whilst by diffused daylight (over here) a second or less is quite sufficient. The development is extremely rapid, by either ferrous-oxalate, metol, quinol, or amidol developers. The prints speak for themselves; they will show *all* the detail of the negative." The prints to which Mr. Walmsley refers are before us, and bear out all that he says with regard to them. It is quite clear that Velox, on account of the facility with which it may be manipulated in subdued actinic light, and yet yield good prints with short exposures, is a very convenient printing surface to employ.

Photography a Fashionable Fad.—According to the *Photo-American* it would surprise many to know to what an extent some of the busiest and most famous merchants in New York indulge in photography in their leisure moments. One well-known New York lawyer has, besides numerous cameras ranging in size from 4 × 5 to 20 × 30, a collection of lenses valued at thousands of dollars. In the houses of several merchants are the most complete arrangements for studio work, as well as every imaginable form of hand and tripod camera for outdoor work. A great many wealthy brokers devote no end of their leisure after "change" closes to photography. In the homes of dozens of men of leisure are studios, where, in the event of an afternoon tea or similar entertainment, the guests are often invited to group themselves so that a souvenir of the occasion may be obtained. This sort of work is more often 18 × 22 than smaller Any one who says photography was a fad, and has gone out of fashion to make room for the wheel or golf, just simply does not know whereof he speaks.

Photographing Babies.—The same writer relates that a veteran photographer, recently gone to the land where everybody "looks pleasant," had a rather odd way of photographing babies. He never demurred at the aunties, grandmas, and fond parents who, when he had the innocent babe seated, did their utmost to disconcert the poor, sweet child by all sorts of grimaces and utterances in a strange, unknown tongue and antics that, outside of his place, would have caused their committal to the nearest lunatic asylum. Oh, no, not he. He was too smart for that by many a long shot. He just waited until those people got tired, and then told them to "leave baby with me and sit down outside." When he got those relations out of sight and hearing, he never did a thing to that defenceless child! He just stared the unfortunate little being off the earth and used bad language at it. The inevitable result was that baby, unused to such unsympathetic response to its howling, assumed an air of innocent wonderment, and just at this moment Mr. "Vet" got in a couple of exposures that almost invariably afforded perfect satisfaction. To all inquiries as to how he quieted baby and secured such a pretty expression the old man was dumb.

Formalin.—Mr. A. Wheatley, in the *American Amateur Photographer*, relates some experiments with formaldehyde, which show that it is a most valuable aid to the photographer. "I use a ten per cent. solution, the same solution over and over again, until exhaustion or until the gas has evaporated. Plates soaked in this solution for five or ten minutes after fixing (first thoroughly rinsing with water) may be left in the washing bath all night without frilling or deteriorating; or they may, after washing, be dried over a lamp or the stove in a few minutes without running the gelatine. In cutting out backgrounds, the gelatine of plates thus treated strips off when wet, after soaking in warm water, as easily as birch bark. Solio prints soaked in the solution before final washing do not frill or stick to the ferrotype. They may be dried in a few minutes on the ferrotype by holding the latter over the stove or a lamp, and, when taken off, will be found to have an exceptionally brilliant polish. I have seen it stated that Solio prints, after soaking in formaldehyde, may be washed in hot water to remove all trace of hypo. My experience is that prints so washed lose all brilliance and much detail. After-toning to a faint purplish tint, washing in hot water, while not causing frilling, has turned the print to the reddish colour first shown when put into the toning bath."

FOREIGN NEWS AND NOTES.

Black Tones.—M. A. Courrèges states that, to obtain black tones on printing-out paper, it is generally considered necessary to use chloro-platinite of potash, or else the chloride of lime or phosphate of gold bath, but the lime bath attacks the half-tones and the action of the phosphate is uncertain. The author prefers the gold bath with the addition of uranium. It has been stated that prints thus toned are not permanent, but M. Courrèges stated that he has

kept prints thus toned for six years without change. The bath he recommends is—

Chloride of gold	1 part.
Uranium nitrate	1·5 „
Borax	15 „
Water	2000 „

The bath acts very energetically, and therefore the prints must be strongly over-printed.

The Action of Light on Glass.—Professor H. W. Vogel points out, in *Photographischen Notizen*, that very little attention is paid as a rule to the glass used in studios, and that a great number of glasses are affected by light, becoming yellower, and thus cut down the blue rays, which are most energetic on ordinary plates. To test whether a glass is sensitive to light is very easy in summer. A piece of the glass should be cut in two, the one half laid in the dark, the other in sunlight, and after eight days the two pieces should be compared. Any change will then be readily seen. In the winter Vogel suggests the use of the arc light instead of the sun.

Anti-halation Backing.—At the present time considerable interest seems to be aroused by the subject of halation, and M. Ducos du Hauron suggests the following paste, which, before being applied to the plate, must be heated to 40° or 50° C.:—

Paraffin (solid)	20 parts.
Olive oil	20 „
Lamp-black	10 „

Dr. E. Vogel points out that, for backing orthochromatic plates, yellow collodion is useless, as this permits a considerable quantity of the green and yellow rays to pass, which may be reflected and cause halation. He suggests the use of the following red collodion, which absorbs the whole of the blue, green, and yellowish-green rays, and only allows the red rays to pass, to which the ordinary orthochromatic plate is not sensitive:—

Acridine yellow	10 parts.
Fuchsine	4 „
Alcohol (99 per cent.)	120 „

Filter and mix—

The above solution	20 parts.
Collodion (4–6 per cent.)	50 „
Castor oil	2 „
Alcohol and ether	100 „

Silver Intensification.—At the recent meeting of the Union Internationale de Photographie, held at Brussels, M. Balagny suggested the following method of silver intensification, which seems worth attention. A twenty-five per cent. solution of sodium sulphite is added, drop by drop, to a five per cent. solution of silver nitrate. A precipitate is first formed, which dissolves on the addition of more sulphite, and, as soon as the solution is clear, it is ready for use. The negative, thoroughly freed from hypo, is bleached in the above solution, and then redeveloped with hydroquinone or pyrogallol.

Blackening Iron and Steel.—To give a matt black coating to iron and steel, according to the *Revue Suisse*, the objects, well cleaned, should be immersed or painted with a mixture of—

Mercuric chloride	4 parts.
Cupric chloride	2 „
Hydrochloric acid	12 „
Alcohol	10 „
Water	100 „

They should then be dried, and allowed to hang for half an hour in boiling water. If the colour is not dark enough, the operation may be repeated.

Negative Varnish.—Herr Rottmann suggests, in the *Allgemeine Photographen Zeitung*, the following varnish, which, he states, is very cheap and good: 500 parts of alcohol are freed from water by shaking up with potassium carbonate every quarter of an hour for twelve hours and then decanted from the aqueous layer of the potash. To the spirit add 60 parts of sandarac and 20 parts of Venice turpentine; allow to stand for several days and filter, and it is ready for use. The negative has to be warmed before applying the varnish.

Fluorescent Screens.—M. Le Roy recommends the following method of preparing fluorescent screens for radioscopy. The fluorescent salt, which may be the platino-cyanide of potassium, sodium, or barium, or calcium tungstate, is suspended in collodion, and not gum arabic or other aqueous liquid. Transparent and colourless celluloid should be cut into pieces and macerated in a mixture of 3 parts of acetone and 1 part of amyl-acetate in such proportion as to give a very syrupy solution. [This would be from 10 to 15 grains per ounce.—Ed.] The platino-cyanide should be rubbed up in a mortar with some of the acetone and amyl-acetate without the celluloid, and then this mixed with the celluloid. The normal quantity of platino-cyanide is 154 grains for a screen measuring 7 × 9 inches. The best support is a flexible film of gelatine, such as is sometimes used for negative work.

A Dry Developer.—M. Bani, of Pisa, recommends the following dry-powder developer for tourists:—

A.

Metol	15 parts.
Hydroquinone	40 „
Eikonogen	25 „
Boric acid	10 „

Mix well, and keep in a yellow glass bottle, hermetically sealed.

B.

Sodium sulphite	100 parts.
Borax	25 „
Sugar of milk	25 „

For use, mix—

Powder A	2 parts.
Powder B	4 „
Water	100 „

For bromide paper, dilute this with an equal quantity of water.

The Preparation of Celloidine Paper.—In the *Deutsche Photographen Zeitung*, Belitzski gives the following method of preparing celloidine paper:—

Strontium chloride (crystal)	30 parts.
Lithium chloride (anhydrous)	10 „
Distilled water	62 „

When dissolved, add—

Glycerine (by weight)	160 parts.
Absolute alcohol (by weight)	218 „

To make the collodion—

Raw celloidine collodion (three per cent.)	400 parts.
The above solution	30 „
Silver nitrate	12 „

The silver should be dissolved in sixteen parts of water by the aid of heat, and mixed with thirty parts of absolute alcohol, before adding to the salted collodion. Finally, to the collodio-chloride emulsion should be added—

Saturated alcoholic solution of citric acid	12 parts.
Ether	50 „

All these should be weighed, and not measured out. If the paper is to be kept, it should be brushed over on the back with a two per cent. alcoholic solution of citric acid. The paper is ready for use in half an hour.

INSTANTANEOUS AND TIME EXPOSURES.

Good photographs may be fairly denominated as either "notes" or "pictures" when they aim at being something more than mere copies of objects for trade or other special purposes, a class of work outside the intentions of this article. I have adopted this arbitrary distinction as a suitable preliminary to a little talk on the pros and cons. of time and instantaneous exposures. Do we desire a record of a passing effect for itself, or something more important, that will, in addition to the record, bear the impress of the individuality of the worker, for, if we do, snap-shot work is, I think, scarcely a suitable method for obtaining it, although most beautiful effects are occasionally secured. The stamp of individuality is undoubtedly placed on the work at the time of exposure, rather than in any other part of the process, although a certain amount of control can be exercised both in development and in the printing, inclusive of what is usually termed "faking," which is by some considered

unpermissible treatment in *any* degree whatsoever. My ideas are somewhat liberal on this point, for in picture-making by photography, or any other method for the matter of that, any little alteration that will tend to improve the artistic quality of the work is, I think, quite legitimate. However, this is a debatable question, and one upon which differences of opinion will, I suppose, always exist.

The exposure, in addition to working the shutter, deals with the composition of the subjects, the massing of the light and shade, the choice of illumination, and the direction of the light, all of which are permanent factors, right through to the completed picture, the massing of light and shade partially excepted. The manner in which the subject is lighted is perhaps the most important point of its construction, even more so than the composition, although it is somewhat difficult to draw a line between the two, as light and shade is a very important element in the construction, a strong shadow or a brilliant light being equivalent to a solid object. If only a "note" of some special effect is required, the conditions being suitable, merely press-the-button work is needed; even for this, the knowledge that the effect will be satisfactorily reproducible by photography is required, otherwise the snap-shot is a failure.

It goes without saying, that thousands of charming effects to the eye are deceptions to the photographer, and the most experienced are at times surprised and disappointed at the results of these exposures; but, all due praise to the modern dry plate, these undesirable results are much reduced from those that obtained in the old wet-collodion days; the partially orthochromatic properties of all good rapid gelatine plates will account for this, but will not at the same time dispense with the exercise of due judgment in the matter of colour values. The examination of whatever is to be photographed through neutral tinted glass is far from the fad which some consider it to be, and is an unmistakable help to correct judgment, especially to those who only occasionally indulge in photography. "It spoils the effect," I have heard remarked, which is perfectly true in many cases; but, as the lens is not sentimental, it is better to spoil the effect than waste a plate with the unavoidable after-troubles of development and printing.

It is quite possible to obtain a photograph possessed of the most beautiful points that were absolutely unseen or unnoticed at the time of the exposure, and only show up as a pleasant surprise when the negative is developed, the real motive assuming quite a secondary position. One of the principal inducements to go in for snap-shot work is the chance of securing some effect that could not by any possibility have been anticipated or to any way thought out beforehand. A quick artistic eye will notice beautiful effects and combinations of forms, and snap them then and there as memoranda rather than pictures.

Fortunate coincidences do occasionally happen when all points that go to make a picture present themselves in happy association, and lucky is the photographer if he can appreciate and secure them with a suitable lens. These are the prizes in the photographic lottery that may be obtained by intelligent observation and perseverance, and, once secured, redound to the credit of the worker and the pleasure and advantage of other people. They must not be expected to occur frequently, at least to afford frequent chances of recording, but, when they do, are ample reward for the trouble incurred, and act as a grand stimulus to further attempts. Pictures so accidentally composed are object-lessons in themselves. We, with these pictures before us, have the opportunity of studying at leisure how the effects are built up, perhaps more easily than from nature itself, so that at some future time we may put our knowledge to practical use by knowing what to look for in our photographic rambles.

It is always a good plan to note the direction of the light and time of day when any exposure is made, no matter how unimportant the subject may be deemed if it is sufficiently attractive to photograph at all. This suggestion is especially applicable to those touring and making a large number of exposures if they are not developed until some time afterwards, the conditions under which they were taken becoming somewhat hazy, and details respecting them escaping the memory, or have become mixed, which amounts to much the same thing. The use of notes is chiefly valuable for future reference, and must not be supposed to apply usefully to the negatives about which they were written, except on rare occasions, for instance. We have a picture answering the following description: Open landscape with dark foliage, some bright effective lights, and shadows full of detail, light coloured objects in foreground full of half-tone. Note.—"Cloudy day, gleams of sunshine—11.15 a.m.—light from the right—heavy rainy clouds on the left—gusty." Without the notes, it would be difficult to tell the conditions under which the negative was taken with anything like certainty, but seeing the notes and result together it would be more easy at some future time to repeat the effect.

Although snap-shot work is useful enough in its way, picture-making must come under the head of time exposures, and the plan of the subject must be mapped out in the mind before making an attempt to expose. There are two ways of doing this, one by the ideal composition of a picture, and then waiting until a place and surroundings are discovered that may be made to fit the idea; another way being unprepared with an ideal composition, but seeing a picturesque spot under different conditions of light, choosing the best, with the addition of any accessories, that may be suitable and available. I need not say this latter is by far the most usual way of going to work, and is followed by most of our best exponents of landscape photography. One can scarcely imagine the difference in a view produced by nothing more than the various directions of the light unless they have seen it for themselves. By practice, *some* idea may be formed in a general way of what to expect under certain conditions of light and atmosphere, for instance, with the sun directly at your back the lens pointing away from it, a flat effect may be predicted, or on a hazy day with the sun in front distance will be buried and shadows flattened; but, as to the exact appearance of the views under various lights, only seeing the spot under these different conditions will convey the least idea of the actual appearance.

"Time" exposures I look upon as absolutely necessary for ordinary landscape work. If *very* rapid exposures are made, there is usually a loss of *quality*. The details in the deep shadows are too weakly impressed, and, by the time development has forced out all it can, the lights become too dense; in addition, we get a wrong scale of tone, in which delicate variations in the lights are destroyed. The distances suffer particularly. It is true we get brilliant pictures, but at the expense of proper gradation. At the same time, I by no means counsel the use of very slow plates, unless for special subjects; one of moderate rapidity has, I fancy, some advantages over either specially fast or slow ones, as the rapid require such cautious treatment all through the chapter, and whose keeping qualities are not beyond suspicion, so that, for my own part, I cheerfully relinquish the extra speed for extra certainty and comfort in working. At the present time this appeals to me more than formerly, as it is only occasionally I shoulder the camera for a few hours' amusement, so the more liberty I can take with a plate without damaging the result, the better I like it; but, setting aside any personal feelings, I consider that to secure the finest quality of image the light must have more than an instantaneous impact on the *dark and shadowed* portions, whatever may be required for the brightly lighted and distant view. Many days this summer have been cloudless, and the contrasts of light and shadow in masses of foreground foliage most intense, the shadows appearing to the eye almost black, a prolonged scrutiny failing to discover detail and the most shadowed parts, when, if the light has been more diffused, the blackness would give place to form even in the deepest recesses. We know of the existence of detail, and the lens would show more in all probability than that visible to the eye. At the same time, a *very* rapid exposure on such a subject would not be satisfactory even with the most rapid plates and lenses with large apertures, so far as I have had opportunities of testing it.

A close observation of the effect of cast shadows is an interesting study and may be pursued during any country stroll with advantage; it will soon be found that, early or later in the day, the effects are infinitely more artistic than at mid-day or thereabouts, unless we are in a very shaded and sylvan district, where the amount of shadow is so great that as the day wanes the light becomes too weak for satisfactory photography. A midday sun has the effect of dwarfing objects as well as showing them to the worst advantage; it takes all the picturesqueness out of them. Of course something depends on the style of scenery, one kind may suffer less than another, but, as a general rule, long shadows lead to impressiveness of effect and short ones *vice versâ*.

A few experiments, made by taking the same place under different conditions of light, will be well worth the trouble, and form a much more forcible argument than any amount of writing can possibly do.

EDWARD DUNMORE.

THE PARIS ETHER SATURATOR DISASTER.

AT the Paris Eighth Metropolitan Police Court on Thursday, August 19, commenced a trial which recalls to memory one of the saddest events ever recorded. The catastrophe of the Charity Bazaar in the Rue Jean Goujon, in which so many persons lost their lives, says the Paris correspondent of a daily contemporary, evoked a cry of horror from every corner of the civilised world. It was while a number of ladies belonging to the highest class of French society were engaged on the afternoon of Tuesday, May 4, in a sale for the benefit of their poorer fellow-creatures, that fire suddenly broke out in the light structure in which hundreds of

friends and sympathisers were assembled. In an incredibly short space of time the building was reduced to ashes; and, although heroic efforts had been made in the work of rescue, about 130 fatalities occurred, while among those who still survive not a few will to their dying day bear traces of this appalling disaster in the shape of broken health. The conflagration originated through an accident to the cinematograph, which had been installed as a great attraction of this fancy fair. At ten minutes past four, during the fourth exhibition, M. Bailac, who was conducting it, suddenly asked the spectators to excuse him for a couple of minutes, as he had to fill his ether lamp, which had gone out, and then requested his assistant, M. Bagrachow, who, after opening a shutter so that the public might not be plunged in darkness, had joined him behind the curtain, to give him some light so that he might see to pour the liquid into the receptacle. M. Bagrachow struck a match, and, although he took, as he affirms, every precaution, the ether vapour caught fire, and immediately a flame rose which speedily communicated itself to the hangings. M. Bailae and M. Bagrachow made desperate efforts to extinguish the incipient conflagration, but they were unsuccessful, and soon men, women, and children were rushing in the wildest panic in the endeavour to save themselves from the most appalling of deaths.

In the charges brought against them, separately or collectively, M. Bailac, who was one of the most trusted *employés* of M. Normandin, the owner of the cinematograph, and his assistant, M. Bagrachow, a Russian, who has seen active service in the Imperial Army, and has also been engaged at different times by some of the principal photographers at St. Petersburg and Moscow, were accused of culpable imprudence, but they are not the only defendants who figured at the trial. With them was Baron de Mackau, the well-known Royalist Deputy, who, as President of the Committee, was held responsible for the organization. In the indictment, indeed, which was read out at the opening of the proceedings, it is set forth that "the heavy responsibility incurred by M. Bailac and M. Bagrachow in no way extenuates that of M. de Mackau." It was, as is added, his imperative duty to assure the security of the crowd attracted every day by the sale, and he committed a series of blunders by closing the doors leading to the waste ground, by not arranging that they should open outwards, by sacrificing everything to the embellishment of the interior of the bazaar, by putting up not only hangings, but decorations which were not fireproof, and by installing a kitchen near the buffet, though the Abbé Delamarre had placed it twenty yards from the structure on the waste ground. These errors were aggravated by his authorising a cinematograph exhibition, which worked under his direction, on a site fixed by him, in a room constructed with planks, covered with a tarry material, and hung with light stuffs. It is in vain that he pleads ignorance, which cannot be an excuse, and argues that M. Normandin should have pointed out the danger. The organizer of the bazaar should have informed himself, and should have asked, if necessary, for advice, which would not have been withheld. He should have adopted all the precautions suggested by human prudence, and his only excuse is the charitable object, which he followed with a zeal worthy of recognition. The indictment concludes by stating that, as the defendants are seriously accused of having, by imprudence, inattention, and negligence of the regulations, involuntarily caused the deaths of Mesdames Blouska, Raymond, Rochet, Couret, de Villeneuve, Nélaton de Chévilly, Choupé, and other persons who were victims of the Charity Bazaar fire, or who died in consequence of injuries received, and of having, for the same reasons, caused wounds to Messieurs Blount, Reille, de Montgermont, Garnier, &c., the Juge d'Instruction is requested to bring them before the Correctional Tribunal to be judged according to the law.

Baron de Mackau was the first of the defendants examined by the presiding Judge, who addressed him very kindly, speaking of the loss which he had sustained and of the courage which he had displayed in saving life. In reply to various questions, he said that in some respects he had improved the arrangements, though he admitted that the door for the firemen had been suppressed. Many of the decorations had been used before, and if they were not fireproof the case was the same elsewhere, at the Elysée and at the Ministries during evening parties. He confessed that he had never thought of fire breaking out, and if the pompiers had been on the spot they would have been of no avail, as the flames spread so rapidly. Nor, indeed, could they have made breaches for the people to pass through, as in three minutes the whole structure was burning. He had raised objections about the cinematograph, but a colleague had insisted and had undertaken all the expenses. Nothing of a striking character was derived from the examination of M. Bailac and M. Bagrachow, and now came the turn of the witnesses. One of them. M. Dussault, said that he had had the fatal idea of offering the cinematograph to M. de Mackau, who objected, but accepted after submitting the matter to the committee. Feeling that the responsibility was too heavy for him, he, M. Dussault, made the affair over to M. Normandin. He had taken precautions for the exit of the public from the room. At the beginning of the performance M. Bailac had asked him for a candle, but he had refused, remarking that it was too dangerous.

M. Normandin, the owner of the cinematograph, who was next called, said that he had given certain counsels about its arrangement which had not been altogether followed. Very interesting was the deposition of M. Bunel, the expert, whose report has already been noticed. He stated that all the doors of the structure allowed the egress of twelve hundred persons on the condition that there was no panic, and that the doors opened outwards. M. Girard, the Director of the Municipal Laboratory, gave an explanation of the Molteni lamp employed, and said that the fire was not due to any defect in its fabrication, the fact being that the flame which burnt the hangings was caused through the imprudence of one of the operators who had brought a lighted match too near the ether vapour. M. Oppenheim, who acted as Secretary-General, confirmed the assertion that Baron de Mackau had enjoyed the confidence of the committee, which had invested him with the fullest authority. If he had been present at the meeting, he would, like his colleagues, have approved of M. de Mackau's project. Baron de Schickler said that he had adopted all the suggestions made by M. de Mackau, and that he had perceived no objection to the arrangements of the cinematograph, the more so as it was to be managed by an expert. Count Albert de Mun, who followed, had known nothing of the plan, but had trusted M. de Mackau. He said that he would certainly have raised no obstacle, and that it had never occurred to him that there was any risk. M. de Pontalba, who was close to the Baron de Mackau when the fire broke out, deposed that he had heard calm enjoined, and that M. de Mackau had proceeded to one of the doors to prevent a crush and to try to save as many people as possible. As for himself, he had hurried to another door. "And did you also help to save life?" asked the presiding Judge.

M. Marty, who was near the cinematograph, heard a match struck and saw a flame rise at once, which the two *employés* endeavoured to extinguish, but the more they blew the more it increased. M. Jules Auffray had seen no danger in the arrangement of the cinematograph. "I have known Baron de Mackau for the past twenty years," exclaimed this witness. "At every assemblage, whether political or religious, he has always shown extreme prudence, taking precautions against fire and crush down to the smallest details, so much so, indeed, that I considered him excessively timid." M. Leturcq, who had insured the bazaar, stated that the company had raised no objection to the cinematograph, and Mr. Henry Blount, who followed, declared that firemen had never been engaged at previous bazaars, except when they were held in private houses. Baron Reille, M. de Gosselin, and M. Amédée Dufaure successively defended M. de Mackau, M. Dufaure explaining especially that the members of the committee had not always deferred to his views, and that therefore, in this case, he had acted with their complete knowledge and approval, as they had considered that the cinematograph was not a source of danger. The Abbé Delamarre, who was the next witness, gave an account of the conditions which had been imposed on him by the Prefecture of Police.

M. Wattine then addressed the Court for the prosecution, going closely into every detail. He maintained that due precautions had not been adopted. It was sad to have to say it, but Baron de Mackau had paid much more attention to the security of the structure than to that of the guests. Yet he should have foreseen the possibility of a sudden crush, and should have made arrangements for the rapid exit of the public. The four doors giving on the waste ground all opened inwards, and one of them had been suppressed. Nor was the *personnel* sufficient for the purpose. There were only four men in all to wait. Terrible, indeed, was the scene witnessed when the flames burst forth. People were trampled upon, and the weakest went to the wall. As for M. Bailac and M. Bagrachow, the error of which they had been guilty was inexcusable. Must they be severely condemned, however? He did not think so. As they had displayed great courage in snatching victims from an appalling fate, much must be forgiven them. Was not the thought that so many had perished through their imprudence sufficient punishment already? Then M. de Mackau, who had lost so many friends, had almost expiated his fault, too. Yet there were responsibilities which poignant grief could not altogether efface. Unjust letters had been written, and unfair accusations brought under the influence of anguish, and he would therefore proclaim that M. Bailac and M. Bagrochow had been burnt while saving life, that M. de Mackau had displayed the most admirable *sang-froid*, and that it was not his fault if his example had not been followed. He had dragged women on to the waste ground, and many owed him their lives.

It was now the turn of Maître Decori to speak on behalf of Baron de Mackau, and he said that it was with painful emotion that he saw so good a man in such a position. His client had begged him to keep closely to the facts which had been brought forward, and he would comply with his wishes. At the same time, however, he must maintain that M. de Mackau was not responsible for the catastrophe. He had not only adopted, but had added to, the measures of precaution imposed on the Abbé Delamarre by the Prefecture of Police, a step which was in accordance with his invariable custom. M. Monteau then addressed the Court for M. Bailac, declaring that his life had been nothing but a nightmare since the catastrophe.

THE EASTMAN AMATEUR PHOTOGRAPHIC EXHIBITION.

The Eastman Company inform us that they have engaged the New Gallery, 121a, Regent-street, for the purpose of the Eastman Photographic Exhibition. The Exhibition will be opened to the public on Wednesday, October 27, and will remain open until Tuesday, November 16, inclusive.

The Company have decided to make an extension of the time for sending in competing photographs, and will receive exhibits up to and including Saturday, October 9.

One-hundred and thirty prizes, to the value of 598*l.* 15*s.*, are offered. The following are the principal conditions of the competition :—

All Kodakers are entitled to compete for the prizes under the following conditions : All prints, enlargements, and lantern slides are to be from negatives made with a Kodak, Bullet, Bull's-Eye, or other Eastman camera, on Eastman's transparent film. The prints may, however, be by any process. All competing pictures and lantern slides are to become the property of the Eastman Company. The negatives from which all prize-winning pictures and slides are made are to be loaned to the Company for a period of six months, and may be used by them for advertising purposes. All pictures are to be suitably mounted, but not framed, and sent, charges prepaid, to any one of the following addresses: Eastman Photographic Materials Company, Limited, No. 115–17, Oxford-street, London; No. 5, Avenue de l'Opéra, Paris. Eastman Kodak Gesellschaft, m.b. H., No. 91, Markgrafen-Strasse, Berlin. Eastman Kodak Company, Rochester, New York.

Any competitor may enter any number of prints, but no competitor will be awarded more than one prize in one class, and work from same negative will not be awarded prizes in two classes. Each print or enlargement must be marked plainly in ink on the back with the name and address of the competitor, and the class in which it is to be entered. Lantern slides must be similarly marked on the back of the mask. Use red ink, or, better still, a red pencil on a black mask. The Company will promptly acknowledge the receipt of prints and slides, and when the awards are made will send to each competitor a list of prize-winners. A section will be arranged for the exhibits of those who send pictures but who do not desire to enter into competition. The decision, in all questions that arise, will be left to the Judges, whose award will be final. No *employés* of the Eastman Company or its branches will be allowed to compete.

The Judges are Messrs. Maurice Bucquet, President Photo-Club, Paris; Andrew Pringle; and H. P. Robinson.

Further particulars of the competitions may be obtained of the Eastman Company at their various offices.

LIVING PICTURES IN BOOK FORM.

Messrs. O'Neill & McNally, of Padiham, have devised a method for producing the above. They take a series of consecutive photographs or pictures illustrating figures or representations in different and divers positions or attitudes, and bind them together in book form, so that by holding the book in the hand, and drawing the thumb over the top edges of the leaves, the pictures will appear to be realistic or animated, and resemble, as near as possible, all the natural movements of living organisms.

The figures may illustrate a prize fight, a cock fight, a wrestling match, a skirt dance, skipping, a drinking bout, or the like, the subjects in this respect being practically unlimited. The respective movements of the figures are represented or imitated to a nicety by the rapid slipping of the leaves through the fingers, which has the effect of producing an optical illusion as perfect as it is amusing and interesting.

Instead of photographs, the figures or pictures may be drawn or painted by hand, and afterwards lithographed or printed from wood or zinco engravings. The photographs or pictures may be printed, impressed, or embossed on paper or card sufficiently stout, that the constant manipulation of the leaves in the manner described will not have a tendency to cause them to curl to any appreciable extent, or otherwise to bend or tear. They may be fairly encompassed by a substantial binding and secured by cross stitching or wiring, or otherwise, as may be thought expedient.

[Our readers are, of course, aware, that animated photographs in book form have, for several months past, been articles of commerce. —Eds.]

WAIN'S IMPROVEMENTS IN PHOTOGRAPHIC DISHES.

This invention relates to dishes, baths, or shallow vessels employed in developing, washing, toning, and otherwise treating photographic negatives, films, and prints, and conducting other chemical operations, and has for its object a rocking dish or shallow vessel, which shall be self-levelling or preserve normally a horizontal plane, that is to say, a dish that, when released by the hand after being rocked, will automatically dispose itself horizontally, so that the solution shall spread itself evenly over the surface of the plate or the like under treatment.

The self-levelling rocking bath consists of an ordinary shallow tray or dish having a flat-faced and broad bar, rib, or lift laterally crossing its under side, and of such a breadth that the centre of gravity always falls upon the elevated side. The edges of this rib or bar constitute double centres disposed on either side of the centre of the dish itself, so that, when the dish is rocked, the centre of gravity always falls on the elevated side—hence a self-levelling bath.

Fig. 1 represents an under-side plan of a photographic developing dish or bath, or similar vessel, provided with a broad transverse rib crossing the bottom of the same, whereby the said dish admits of being readily rocked by tipping alternately upon the opposite edges of the same, and also of levelling itself, when released, and of coming to rest upon the rib.

Fig. 2 is a longitudinal vertical section of fig. 1, upon the dotted line,

Fig. 1

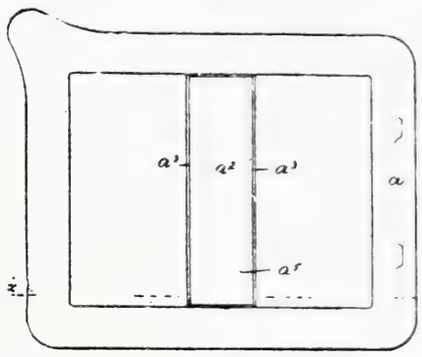
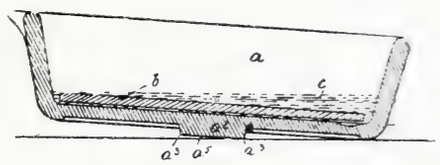


Fig. 3.



x, showing the bath at rest in its normal horizontal plane, and with the developer or other solution contained therein spreading itself evenly over the face of the plate lying upon the bottom of the same. Fig. 3 is a like view, but showing the dish in the act of being rocked.

a is the bath or dish, and a^2 is the broad transverse rib crossing the bottom of the same, with the edges, a^3, forming the centres of motion, or

Fig. 2.

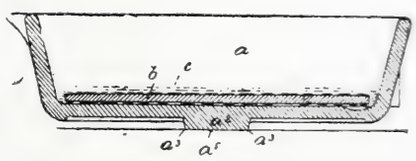


Fig. 4.

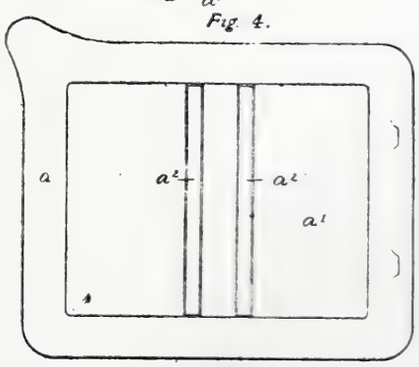
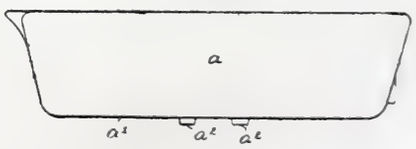


Fig. 5.



parts on which the body of the dish alternately turns when being rocked, whilst the flat surface, a^5, is the normal bearing or stand part whereon the dish or tray rests when not being rocked.

b represents the plate or the like being developed or otherwise treated, and c is the developer or other solution.

Instead of employing a broad and flat bar or rib, I may employ the

equivalent in the form of two separated and narrow flat bars or ribs, which form the double centres of motion of the bath.

Fig. 4 is an under-side plan of a developing dish so provided, and fig. 5 is a side elevation of the same.

a is the bath, and a^2 the pair of narrow and separated ribs transversely crossing the bottom, a^1, of the same, the said ribs being at a distance apart suitable for the purpose for which they are designed.

Or the bottom, or the middle of the opposite sides, of the bath may be provided with a pair of webs running in the longer direction of the said

Fig. 6.

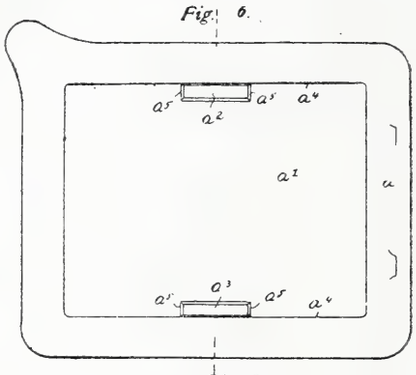
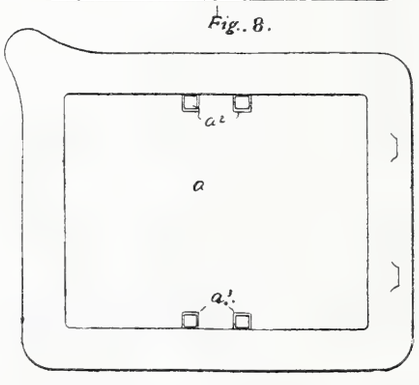


Fig. 8.



bath, and which are the equivalent of the ends of a broad transverse rib, and upon the ends of these centrally disposed lifts the vessel is rocked.

Fig. 6 represents an under-side plan of a bath or dish provided with this form of my invention, and fig. 7 is a cross section thereof.

a is the dish, a^1 the bottom, and a^2, a^3, the webs or short ribs disposed at the middles of the opposite side edges, a^4, of the said bottom, and a^5 are the ends of the said ribs, the opposite pairs of which constitute the centres wherein the dish is tilted for giving a rocking motion to the dish, and causing the solution within the same to flow to and fro over the

Fig. 7.

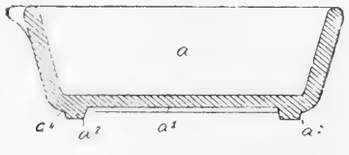
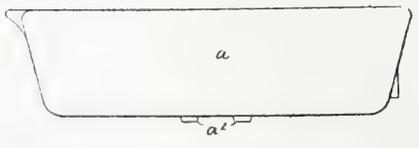


Fig. 9.



surface of the negative, film, print, or the like, whilst the said opposite webs or ribs constitute feet whereon the tray or dish normally rests in a perfectly horizontal position.

Instead of flat web lifts, two separated feet may be employed on each side of the dish as the equivalent of the ends of the separated bars, as represented in under-side plan in fig. 8 and side elevation in fig. 9.

a is the bath, and a^2, a^3, are the opposite pairs of separated webs or feet.

It is understood that, by the rocking of the dish upon the edges or corners of the broad rib or its equivalent, the liquid therein is caused to flow backwards or forwards over the plate or the like being developed or otherwise treated.

A NEW VIGNETTING APPARATUS.

THE above is the invention of Messrs. Harris & Eyres, and it consists in the novel construction and combination of the parts.

In the drawings fig. 1 is a side view of the vignetting apparatus; fig. 2 is a front view of the same.

A is a portion of a photographic camera of any improved construction; B is a support which is preferably a metallic tube. The support, B, is secured at one end to a plate, b, which is fastened to the camera so that the support is in a substantially horizontal position. B is a sheave journalled on a pin, b^1, which is carried by the front end portion of the support.

C is a sleeve which is slidable longitudinally on the support, B, and which is also free to oscillate on it.

D is a driving sheave journalled on a pin, d, projecting from the front of the camera. The sheave, D, is provided with a handle, d^1, for revolving it.

E are two guide sheaves which are journalled on a pin, e, carried by a

FIG. 1

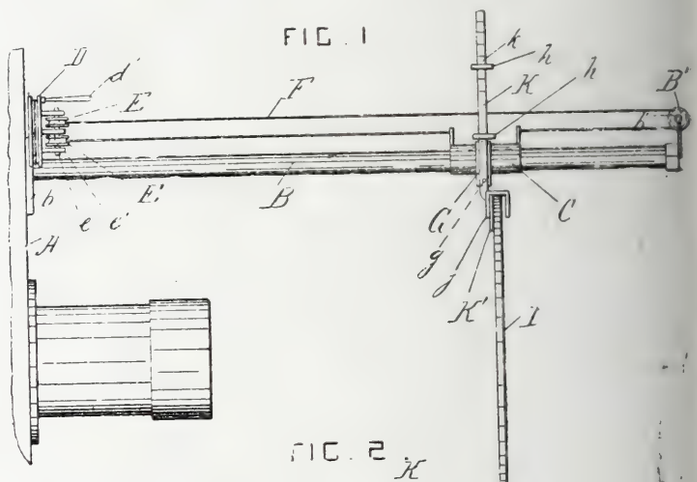
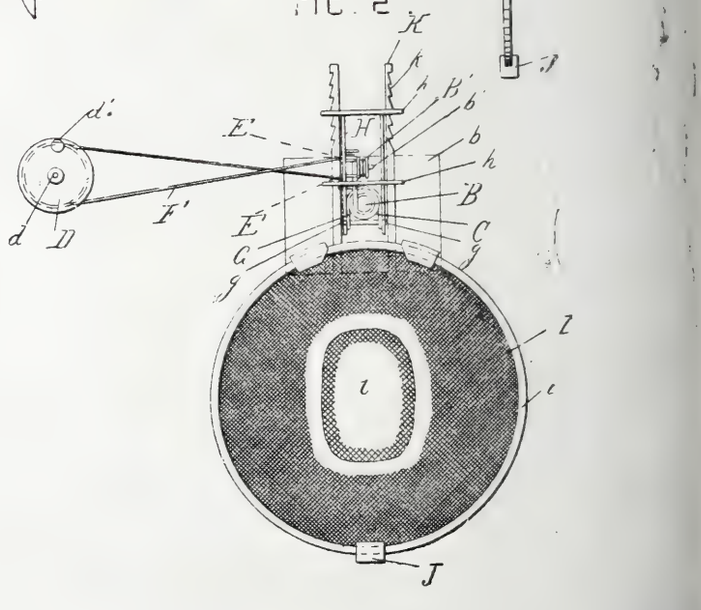


FIG. 2



bracket, e^1. The bracket, e^1, is secured to the plate, b. F is a flexible connexion, such as a cord or chain. The ends of the flexible connexion are secured to the sleeve, C, and it is passed over the sheaves, B^1, D, and E, as shown in the drawing, The sleeve, C, is moved back and forth by means of the flexible connexion, when the driving sheave is revolved.

G is a saddle bracket secured to the sleeve, C, and provided with laterally projecting knife edges, g.

H is a frame which is pivoted on the knife edges, g, and provided with cross bars, h. I is a vignetting disc, provided with an aperture, i The disc is of any approved construction, but it preferably consists of two plies of woven wire gauze with an intervening sheet of paper or similar fabric. The opening through the various plies of wire gauze and paper are of different size, so that the light is cut off gradually around the common opening, i. The disc is provided with a rim, i^1, which holds the plies together.

J is a weight secured to the lower part of the rim, and j are clips secured to the upper part of the rim.

K are two spring bars provided with notches, k. The lower ends of the bars, K, are secured to a plate, K^1, with which the clips of the

vignetting disc engage. The disc may be disengaged from the plates as often as desired, and other discs substituted for it.

The bars, K, are slidable in holes in the cross bars, *h*, and the said holes are wider than the bars. The resiliency of the spring bars holds the notches, *k*, in engagement with the upper cross bar, but, when the bars, K, are sprung together with the fingers they can be raised or lowered so as to bring the vignetting disc into a convenient position in front of the camera.

The vignetting disc cuts off portions of the light so that the background of the negative is shaded around the picture, and many vignettes can be printed from the shaded negative without each having to have special care bestowed upon it to produce the shaded appearance.

BLUE-COLOURED LANTERN SLIDES AND TRANSPARENCIES.

MR. T. C. PORTER, of Eton College, has patented a process for producing a plate or film suitable for lantern slides or transparencies which will represent a picture in various shades of blue, such film being particularly suitable for ice and snow scenes, clouds, and seascapes.

In carrying my invention into effect, says Mr. Porter, I take a plate or film coated with gelatine or other suitable substratum, and I immerse or place the same in contact with a solution of ferric ammonium citrate or other ferric salt. I preferably employ a strong solution of ferric salt, and immerse or place the plate or film in contact for about three minutes. I then remove the plate or film, and rapidly wash off the excess of the solution with distilled water. It is of great importance that the excess of sensitising solution should be washed off both immediately and rapidly. The plates or films are allowed to dry, and are then ready for exposure, usually by contact with a negative in a strong light.

They are developed by immersion in a solution of potassium ferricyanide, and fixed by washing first with dilute hydrochloric acid, and then well washing with soft or distilled water.

The positives thus produced are of a blue colour inclining to green, but, by subsequently treating them with a bath of very dilute ammonia or other alkaline hydrate, the said colour changes to a violet blue, finally becoming a pale reddish-brown should the toning process be continued too long.

I find that one part of a solution of ferric ammonium citrate saturated at ordinary temperatures to one of water is very suitable for sensitising.

I also find that one gramme of potassium ferricyanide dissolved in 8 c. c. of soft or distilled water is suitable for development. The fixing solution is made with about *five per cent.* of pure strong hydrochloric acid, the rest water.

The toning solution contains about two drops of ammonia solution (·880) to the ounce of distilled water.

News and Notes.

MR. DUNCAN DALLAS, of 5, Furnival-street, Holborn, E.C., announces the formation of a School of Photographic Engraving. Prospectus and all particulars as to terms can be had on application.

THE NORTHERN PHOTOGRAPHIC WORKS, LIMITED.—This Company has been registered by Cox & Lafone, of 3, Salters' Hall-court, Cannon-street, E.C., with a capital of 2000*l*., in 1*l*. shares. The objects of the Company are to acquire, and carry on, the business of photographic apparatus and camera manufacturers, carried on under the style of "The Northern Photographic Works," at 45, Salisbury-road, Barnet, and to enter into an agreement with Birt Acres. The regulations of Table A in most cases apply. Registered offices, 3, Salters' Hall-court, Cannon-street, E.C.

A NEW and enlarged edition will be commenced early next month of *The Queen's London*, Messrs. Cassell's popular pictorial work, which on its first appearance attained a circulation of over 50,000 copies. The forthcoming edition will be enlarged by nearly 100 pictures, and the first part will consist of views of the Diamond Jubilee Procession. In addition to these, over sixty other new plates are being prepared, and these will represent the most recent public buildings and other remarkable sights and scenes of London and its environs, so that the work in its new form will fully represent London in the Diamond Jubilee Year.

EXHIBITION OF LITHOGRAPHY. — On Tuesday last an Exhibition of lithographic works, executed by British artists from 1808 up to the present time, was opened in the Bolt-court Technical School. The early examples were very interesting, including pictures by Prout, "David Wilkie," R. J. Lane, David Roberts, &c. The subjects treated are also of historical interest, and one series shows the construction of the Great Western Railway. The modern section contains fine examples of Watson, Mortimer Menpes, Pennell, Anning Bell, Whistler (a series of eleven in number), Shannon, Wey, the late C. E. Holloway, W. Rothenstein (series of portraits of celebrities), F. Short, H. H. Lathange, Greiffenhagen, J. W. Waterhouse, &c. One noticeable contribution is the Gladstone portrait of J. McClure Hamilton. There are also albums of lithographic portraits, a small collection of wood-engravings, and an excellent chromo-lithograph of the Chandos Shakespeare. It is hoped to make the Exhibition an annual one, and to greatly enlarge it in the future; but, as it stands, it is well worthy of a visit. The Exhibition will remain open till Monday, August 30, inclusive.

A SPECIAL number of the *Rendiconti della R. Accademia dei Lincei* announces the award of the following prizes, besides others for essays of a literary character: The Royal Prize for Physics to Professor Adolfo Bartoli, of Padua, for his two monographs on the specific heat of water between the temperatures of 0° and 35°, and on the heat of the sun, and for other investigations. For the Ministerial Prize for physical and chemical science eight competitors entered, and the Judges have awarded a prize of 100 lire to Professor Carlo Bonacini, of Modena, for his essays on orthochromatic and colour photography, and on the reflection and other properties of Röntgen rays.

THE National Photographic and Allied Trades Exhibition will be held in the Portman Rooms, Baker-street, London, W., in April next. It is to be a Manufacturers' Exhibition of Photographic, Lantern, and Optical Apparatus and Accessories, and it will be opened to the public as well as to dealers. Already more than half the available space for stands has been definitely allotted, and several of the leading London and provincial firms have booked spaces. The Portman Rooms comprise a very handsome suite of well-lighted rooms, all of which are practically on one level, and, although they have been procured at a very high rental, it is considered that their central situation will justify the outlay. Mr. Arthur C. Brookes is the Acting Secretary to the Exhibition, and applications for space should be addressed to him at Temple House, Temple-avenue, London, E.C.

THE TATE ART GALLERY.—Sunday was the first Sunday opening of the Art Gallery at Millbank, presented to the nation by Mr. Henry Tate, and in the three hours that it was open 3513 persons passed the turnstiles. It was a remarkable fact that a more varied class of persons were amongst the visitors than are to be usually seen at the National Gallery, &c., the working classes of the district having largely taken advantage of the undoubted boon. On the first day of the opening of the Gallery 2506 persons went in; so it is obvious from these figures that Sunday opening is appreciated. Mr. R. M. Morrell, the "father" of the Sunday League, was present during the afternoon, and was heard to express considerable satisfaction at the gradual fulfilment of the prophecy that the gaols of England would be turned into educational establishments. This Art Gallery stands upon the site of the Millbank Prison, and, large though it is, Mr. Tate has promised to add to the building so as to make it more than double its present size. The sixty-five beautiful pictures presented with the building to the nation by Mr. Tate were evidently much admired, as also were the Chantry, Watts, and Vernon collections.

IN the last number of the *Journal of the Photographic Society of India* is an account, illustrated by photographs, of the recent seismic disturbances in Bengal. The author, Mr. A. Thompson, says: "I made several attempts with the *jumelle* to photograph the cracks from the train, but with indifferent success; and accordingly I was rather glad, when the train stopped for a few minutes at Haldibari, to find that the platform had come in for some of the best (or worst) fissures. After taking one or two snap-shots, I hurriedly pulled out and put together my stand camera, and, notwithstanding the difficulty I had in getting a level place for it, and the nervousness induced by the warning that the train would be off without me, I succeeded in getting a photograph. On the right of it is seen a fissure, some two feet wide, extending along the platform. Between the fissure and the brick portion on the left next the train the platform has sunk more than a foot, as may be seen by observing two passengers standing, one on the brick portion, and the other below. The third illustration is of interest photographically, as showing what may be called the *adaptability* of the *photo-jumelle*. It is a snap-shot taken from the train while crossing one of the smaller bridges, and the camera had to be directed nearly vertically downwards. The picture shows the compound fracture and dislocation of part of the brick pier."

THE PARIS DISASTER.—Judgment was delivered in this case on Tuesday last. Baron de Mackau has been condemned to the payment of a fine of 500 francs; M. Bailac to a year's imprisonment and a fine of 300 francs; and M. Bagrachow has been sentenced to eight months' imprisonment and a fine of 200 francs. All the three defendants are allowed the benefit of the Bérenger Law, which means that, as it is their first offence, the judgment will not be enforced against them unless they again get into trouble, which is extremely improbable. With regard to Baron de Mackau, it is set forth in the preamble that, although after hiring the structure from the Abbé Delamarre he adopted certain precautions, he was guilty of serious negligence in omitting to secure the services of a body of firemen, and also in only intrusting the care of the place to two men, one of whom, moreover, was kept outside to open the doors of carriages. Respecting M. Bailac and M. Bagrachow, it is stated that the catastrophe was caused by the grave imprudence of the cinematograph *employés*. It is, therefore, established that Baron de Mackau, Bailac, and Bagrachow were, on May 4, 1897, in Paris, by negligence and imprudence, the involuntary cause of the death or injuries of the persons who perished, or who were wounded, in the fire of the Charity Bazaar. But it is added that the antecedents of the defendants, the courage and energy which they evinced, and the efforts which they made to snatch from death the unhappy victims of their fatal imprudence are a great extenuation of their fault. Thus it is that, although they are duly condemned in accordance with the law to various pains and penalties, the sentences will not be put into operation against them unless they get into a fresh scrape. Baron de Mackau has lodged an appeal against the judgment, and M. Bailac and M. Bagrachow are to follow his example.

THE forty-fourth Report of the Department of Science and Art has just been issued. For the benefit of those who are not familiar with this Departmental publication, it may be remarked that the contents are not merely concerned with museums connected with the Department of Science and Art, and statistics and reports upon the progress of education in science and art during 1896; for appended to the volume is the report of the Director-General of the Geological Survey of the United Kingdom, and also the Report of the Committee on Solar Physics. The number of students under instruction in Science and Art Department Classes in 1896 was 196,185; these were distributed among 10,500 classes in 2583 separate schools. It is satisfactory to learn that practical instruction in science is making progress; but some little time must elapse before sufficient laboratories are provided to enable

all students in Departmental schools to perform the experimental work, without which scientific teaching is of no value. The efficiency of the practical instruction given in certain science subjects is now judged by inspection and not by examination. This should encourage the practical side of science instruction, and prove of great benefit to the students and the teachers. In evening classes as much cannot be done in the development of this kind of instruction as in classes in day schools, but even in these a good beginning has been made in some few cases. It is announced in the Report that it is proposed to divide the Honours stages of the various science subjects into two parts, the first part being intermediate in difficulty between the advanced stage and the second part of Honours. It is also announced that a new syllabus is in preparation to form part of the present elementary stage of biology, and be a preparatory study for biological science in the same way that the new section of the elementary stage of physiography is for physical science.

CRYSTAL PALACE CO-OPERATIVE FLOWER SHOW, 1897: ONE AND ALL PHOTOGRAPHIC COMPETITION.—List of Prize-winners: Class 275, Best Workman's Town Garden, 1st, C. H. Pichon, Colchester; 2nd, O. Mead, Victoria Park, E.; 3rd, F. Gregory, Uxbridge. Class 276, Best Cottager's Country Garden, 1st, Miss Morris, Enfield; 2nd, W. C. Boxall, Bromley Common; 3rd, F. J. Coomber, Morden, Surrey; 4th, A. S. Gotzell, Dover, and Edward Powell, Newark. Class 277, Best Window Garden, 1st, J. Hayne, Chelmsford; 2nd, W. Cottrell, Delph; 3rd, W. Cakebread, Catford; 4th, W. Biswell, Beckenham. Class 278, Best Floral Porch or Archway, 1st, A. Bentley, Durham; 2nd, Miss Morris, Enfield; 3rd, G. Skinner, Beckenham; 4th, A. Powell, Penge. Class 279, Best Back-yard or Corner, 1st, A. Hawkins, Oxford; 2nd, R. Wicks, Brighton; 3rd, Jos. Highfield, Kidderminster; 4th, C. H. Pichon, Colchester; 5th, Edward Powell, Newark. Class 280, Best Rockery or Grotto, 1st, A. Bentley, Durham; 2nd, E. Powell, Newark. Class 281, Best Arbour or Summer House, clothed with Creepers, 1st, T. Smith, Blackheath; 2nd, Miss Morris, Enfield. Class 282, Best Hanging Basket, 1st, Miss Morris, Enfield; 2nd, J. Hayne, Chelmsford. Class 283, Prettiest Interior of Small Greenhouse, 1st, Dan. Reid, East Sheen; 2nd, A. Depledge, Horsforth; 3rd, Miss Morris, Enfield. Class 284, Best Example of Greenhouse used for Tomatoes and Flowers, 1st, C. Wood, Reigate Heath. Class 285, Best Collection of Garden Views, 1st, G. S. Cousins, Bury St. Edmunds; 2nd, T. H. Richardson, Lewisham; 3rd, G. H. Sills, Berkhampsted; 4th, H. W. Wilmot, St. John's; highly commended, Allen Foster, Waltham Cross, and A. H. Archer, Bishop's Stortford; special medals were awarded to French & Co., Wallington, and to C. P. Casstine, Swanley. Class 286, Best Collection of Sylvan Seeds, 1st, H. C. Wharton & Co., Kilburn; 2nd, C. P. Casstine, Hextable, Swanley, Kent; 3rd, John Frisby, Uckfield, Sussex; 4th, Alfred Wilmot, Tyrwhite-road, S.E., and W. R. Wynter, Seaford. A special medal was awarded for Record Photography to Duychart & Co., Chelmsford, for the collection of photographs descriptive of the recent Essex Storm.

Re DRINWATER BUTT, PHOTOGRAPHER, BANK-STREET, CARLISLE. — The public examination of the above-named debtor came on for hearing at the last sitting of the Carlisle Bankruptcy Court, before the Deputy Registrar. Replying to questions put by the Official Receiver, the debtor stated that he commenced business as a photographer in Carlisle in July, 1891, purchasing the business for 800*l.* from a Mr. Waite. Witness's father paid 400*l.* in cash towards that, and bills were given for the remainder by debtor. He paid the bills before they matured, and saved 90*l.* thereby. He had no capital of his own, but he borrowed from his father and his sister. The latter gave him 50*l.* to pay some small debts he owed in Andover and Southsea, Hants. He paid Mr. Waite 710*l.* altogether for the business. He married in 1891. He purchased a camera from his father, the price being ten guineas; but he had not paid for it yet. His father lived at Andover, where he carried on a farm. His father was not a photographer, but he purchased the photographic goods at a sale near Andover. About two years ago witness took premises in Spencer street, Carlisle, and afterwards he took premises in Hartington-place. He sold goods from his studio, principally through the medium of the photographic papers. He was first pressed by a local creditor, but he has also been pressed by trade creditors. Messrs. Eastman and Messrs. Marion & Co. have pressed him for payment of their accounts for goods supplied to him. The manufacturers have formed an association for the purpose of stopping the cutting of prices which went on among the dealers, and, finding that a lot of photographers were pretending to be dealers for the sake of getting extra discounts, the manufacturers made a clean sweep of them, and he was included. It was only a week or two ago that he succeeded in convincing them that he was a *bonâ-fide* dealer; but in the mean time his business suffered considerably, as people would go away, saying, "He has not got any stock." The dealer's discount was twenty-five per cent., whereas the photographer's discount was only ten per cent. He had to spend a lot of money on his studio. He admitted that he had set up a cosy corner in his studio, but he did not know what it had cost. It never occurred to him that he was in an insolvent condition until a few weeks ago. His cash account showed an increase at the beginning of the year, and he thought his dealing business was going to turn out a great success. He also thought that the alterations would reduce his working expenses and increase his trade. The Official Receiver said the debtor estimated his stock to produce 300*l.*, but he did not think that figure would be realised; in fact, he thought it had been grossly over-estimated. The debtor stated that one camera alone was worth between 30*l.* and 40*l.* The "cosy corner" could be taken out just as it was. The Official Receiver said he did not think it could be sold as it was, and that it would only sell for firewood. The debtor, in reply to further questions, said he had about 17,000 negatives, which he valued at 100*l.* He received 6000 negatives from Mr. Waite when he took over the business. If the negatives were set out on tables, and the photographers of Carlisle be invited to bid for them, they would easily fetch 100*l.* Eventually it was decided to adjourn the examination until the next Court.

METHODS OF DEVELOPING KODAK FILMS.—"Every one acquires a pet way of treating films in development. One cuts off and puts his pocket Kodak exposures into holders, or fastens them down by bands at the ends upon glass plates," says *The Kodak News;* "another uses a tumbler of developer for his film and does the whole band at one fell swoop. A third will soak his films in water before development. Another will not have preliminary soaking at any price, and so on. The writer has tried most of the methods and knows which he likes best. He suggests alternative ways for larger films, but for pocket Kodak rolls there is nothing better than to develop the whole twelve at one time by holding each end and passing the band through a *deep dish* with plenty of developer in it. Some prefer to pass the band through a basin of water first, but, remember, this used to be a fruitful source of bubbles with glass plates, and it weakens the development. If only half of the roll be done at a time, you run the risk of spoiling the two end negatives where the division is made if you hold on with the fingers, for the film gets rubbed away by the friction of holding and warmth of the fingers. Of course, it will be said this is unscientific where there are various exposures on one roll. Well, try to get equal exposures or average the results is the reply. For larger sizes, like the 4×5 film rolls, these may be either developed in two bands of six each (and it is even easier and safer than with the pocket Kodak strips), or the exposures may be cut off separately and four or six developed together in one deep dish of developer. When this is done, it is a good plan to place the first film face down in the developer and move it about until equally soaked, then place the next upon it face down, treating it the same, and thus keeping the whole moving all the while. By the time the fourth or sixth is under treatment, the first one can be brought to the top and examined, and the process carried on much as one tones Solio prints. A dish of stronger developer and a very weak, much-restrained developer hard by, are useful adjuncts for under and over-exposures respectively. When they look right, after a quick wash, pass your negatives straight into the hypo or into slightly acidulated water. If you place them in plain water and wait to fix them, they will go on developing with the developer left in the film, and get overdone. In this method of developing several exposures in one deep tray, care must simply be taken that the corners and edges of one film do not cut into the tender gelatine surface of the film above it. A good way in developing films in long bands is to make a special tray or V-shaped trough a little longer than the width-wise size of the film to be developed in it. This trough is attached firmly to the table, and across the upper part of the V a glass roller is fitted so that it will turn easily in its bearings and will not come away. The trough is filled with developer, so that the lower portion of the roller is well in the developer, and, the end of the band of film being passed under the roller with the back of the film to the roller, the whole band may then be comfortably pulled to and fro, and easy, even development assured. It should be noted that developing separate cut-off films singly in *small* quantities of developer may often be the cause of unequal blotchy development. Films are a different thing from glass plates, and require different though equally simple treatment. Adjust your practice to the needs of the case and you will be happy.

Patent News.

THE following applications for Patents were made between August 9 and August 14, 1897:—

ANIMATED PHOTOGRAPHS.—No. 18,610. "Improvements in Apparatus for quickly turning over a series of Photographs or Drawings attached to a Revolving Cylinder." Complete specification. B. DRITTLER and M. ERLANGER.

CAMERAS.—No. 18,667. "Improvements in and connected with, Cameras." R. BALLANTINE.

CAMERAS.—No. 18,695. "An improved Photographic Camera." E. L. DOYEN.

COPYING MACHINE.—No. 18,699. "A new, or improved, Rotating Pneumatic Machine for Copying Photographs." Complete specification. A. SCHWARZ.

ARC LAMP.—No. 18,701. "An improved Electric Arc Lamp for Projection and other Purposes." G. DAVENPORT.

CAMERAS.—No. 18,810. "Improvements in Photographic Cameras." Complete specification. S. FRENCH.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
30	Bradford Photo. Society	*Home-made Apparatus and Dodges.* G. R. Thistlethwaite and F. Nicholson.
30	North Middlesex	Seventh Lantern-slide Competition.
31	Hackney	*Stereoscopic Work.* A. D. Fort.
September. 2	Bradford Camera Club	*Stereoscopic Photography.* E. E. Slater.
2	London and Provincial	*Cloud Negatives and Double Printing by a Stripping Print-out Paper.* W. D. Welford.
4	Hackney	Excursion: Chingford. Leader, A. Dean.
4	Wolverhampton	Excursion: Boningale. Leader, H. Holcroft.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 9,—Mr. J. J. Briginshaw in the chair.

The SECRETARY expected a gentleman from Algeria who is interested in coloured photography but he had not turned up at the meeting. He called on

Mr. Snowden Ward to secure some coloured prints, but had not succeeded very well. Mr. Snowden Ward had sent a few old coloured prints, six in number, by Veress Ferenez, but no particulars with them.

He also wrote to the Photochrom Company, who sent some of their photographs in colour; but they were sorry, they said, that they were unable to give particulars of the process, as it is a secret one. The prints being handed round, a discussion ensued as to the colouring process by which these prints were made. Some opinions were expressed as to lithography being the means used, and some by hand, with the aid of aniline dyes.

Mr. A. L. HENDERSON remarked that the prints by Vereso Ferenez had the appearance of not having been fixed. He also showed some prints made with a Dallmeyer stigmatic lens, No. 3, open aperture, $\frac{1}{200}$ of a second exposure, taken at various times, from one o'clock to 5.30 in the afternoon, and he did not expect to get so much out in the prints.

Mr. BEDDING informed the Association with regret of the death of Mr. W. H. Harrison, who had been ill for some time past, and who had been a member of the Association for some ten years. Mr. Bedding spoke of the unrecognised services rendered to photography by Mr. Harrison. He was the first to suggest gelatine emulsion, in the year 1868, and did not think sufficient credit had been given him for that idea. Also it was due to the strenuous advocacy of Mr. Harrison that the camera-makers reduced the weight of the field camera. He proposed a vote of condolence of the Association be sent to Miss Harrison.

Mr. A. L. HENDERSON seconded this proposal, which was carried unanimously.

Messrs. BRIGINSHAW and FRESHWATER also spoke with regret of the death of Mr. Harrison and of the pleasant times they had spent in his company.

The CHAIRMAN read some questions from the box, viz.:—

1. "What is the best restrainer for an over-exposed plate?"

Mr. A. L. HENDERSON said he used a hydroquinone and metol developer, and he found one of the best restrainers to be cyanide of potassium; he could get all he wanted with that, more so than with bromide of potassium, and, in reply to the Chairman, as to what proportion he used, said one or two drops of a ten per cent. solution; perhaps it would not do so well with a pyro developer.

The CHAIRMAN said he had heard the merits of citrate of potassium advocated.

Mr. HENDERSON replied that that did not seem to be so much under control as the cyanide. He also referred to Andresen's use of hypo as a restrainer.

2. "What is the best way to remove yellow stain from a pyro-developed negative?"

Mr. E. H. BAYSTON said he would like that question answered as his brother has a yellow negative which takes two days to print.

Mr. W. D. WELFORD asked if the negative was a pyro-soda-developed one? If so, there was practically no way of removing the stain.

Mr. BAYSTON asked what would be the best to do to make it print quicker?

Mr. R. BECKETT suggested, if it is a flat negative, bleaching with mercury.

Mr. A. L. HENDERSON agreed with Mr. Beckett.

The SECRETARY asked if the mercury did not tend to make the negative unstable?

The CHAIRMAN said it did not if the negative was properly washed.

Various suggestions were made, such as reproducing the negative by reversal, or reducing it, or making a good print and copying from it, or using a stripping film.

Mr. BAYSTON gave an instance of the use of Cresco-fylma in floating the film from a negative, when the film split.

Mr. WELFORD said that might be caused by insufficient washing.

Mr. P. EVERITT showed a print on paper made in Brunswick; after the print is made, it only requires washing to fix it. The paper prints a sepia or brown colour.

Mr. BEDDING said that it was a resuscitation of a very old process, uranium and silver.

Mr. EVERITT asked why dry plates were so much dearer in Germany than in England? He said the price for plates a little larger than quarter-plate size worked out at about 2*s.* per dozen. He thought that there was a chance for the English dealers to put their plates on sale there, the duty on them would not be much.

The CHAIRMAN asked what is the cause of a deposit at the mouth of a blow-through jet?

The SECRETARY said perhaps it was caused by using impure hydrogen. If coal gas is taken and kept in a bottle for some considerable time, a deposit will form and decrease the light considerably. It cannot be kept for any length of time.

The CHAIRMAN said he had experienced it with recently filled bottles, and it materially affected the light until it freed; it comes out in the form of a little cone. He had not noticed it so much with a mixed jet.

The CHAIRMAN called attention to the new programme, and said the members ought to thank Messrs. Freshwater and Welford for it.

The SECRETARY said, as there were many members of the Convention present, he would like to get together some lantern slides of Yarmouth and district for a lantern evening.

FORTHCOMING EXHIBITIONS.

1897.

August 31 ..... Royal Cornwall Polytechnic Society, Falmouth. Edward Kitto, F.R.Met.S., The Observatory, Falmouth.

Sept. 1–Oct. 13 ..... Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.

„ 27–Nov. 13 ..... Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.

October 4..... Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.

December 9–11 ..... Aintree Photographic Society.

1898.

April..... International Photographic Exhibition (Crystal Palace). R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—Why does not J. Magee give the full name and address of the man that was guilty of such an action?

I think I recognise it very well, and, if the name was published, we should soon hear of plenty of fellow-sufferers.

J. Magee may thank his lucky stars he did not obtain the situation he applied for, as returning specimens unpaid is not the only strange quality this man possesses. He can also bring a man two hundred miles at his (the assistant's) own expense, and reduce his salary 5*s.* the second week.—I am, yours, &c.,

FAIR PLAY.

EAST LONDON ART EXHIBITION, 1897.

To the EDITORS.

GENTLEMEN,—Will you kindly inform your readers that the present Exhibition, promoted by Mr. A. F. Hills, will close at the end of the month, and that it will be followed, early in October, by a Diamond Jubilee Trades and Inventions Exhibition, particulars of which I beg to enclose.

Many interesting and useful inventions have been brought to light during Her Majesty's reign, and it is hoped that the artisan class will largely contribute to make this effort a success. No pains will be spared on the part of Mr. A. F. Hills and the Executive Committee to make the forthcoming Exhibition one of real utility to the British artisan.

A large number of medals of gold, silver, and bronze, will be offered.—I am, yours, &c.,

C. E. OSBORN, *Secretary.*

People's Palace, Mile End-road, E., August 18, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

John Cummings, 21, Mill-street, Alloa, N.B.—*Two sketches.*

W. H. Kempsell, 43, Plashet-lane, Upton Park, E.—*Photograph of the Rev. Edmund Ibbotson (late) Vicar of St. Michael's and All Angels', Walthamstow.*

ATLAS.—Difficult to offer an opinion. The markings look as if caused by the dissolution of the gelatine surface next the glass.

PATENT.—C. A. S. We are unable to say if that particular patent is in force. Several of the Company's patents, we know, have lapsed.

PROCESS.—Sorry we are unable to help in the matter. Our experience is that patent agents, as a rule, are lamentably ignorant of photography.

BLISTERS.—PRINTER. Try the effect of immersing the prints, before washing out the free silver, in methylated alcohol. This method of avoiding them has never failed in our hands. We may add that, without that treatment, we have never met with the trouble with the brand of paper in question.

CARBON PRINTING.—T. BRADLEY. You will find it more advantageous to use a three, or three-and-a-half per cent. bichromate solution at this season of the year than one of five per cent. strength.

ADDRESSES.—S. R. We do not give the addresses of our correspondents in this column; but if you send us a letter, addressed "Care of the Editors," we shall be pleased to forward it on.

NEMO.—It is quite possible, as you say, that the "great abuse" exists; but, as you have not the courage for your letter to appear over your name and address, we shall certainly decline to insert it.

CHLORIDE.—The gelatine is not to blame, it is faulty manipulation all through. Better get some one to give you a little instruction, as you seem to be quite a beginner, and are evidently "at sea" in the manufacture of gelatine paper.

DOUBTFUL TONES.—W. BURTON. The reason why the gelatine prints changed to all the colours you mention is that you washed them in dirty dishes, or the water was contaminated with hypo, or perhaps your fingers might have been.

COLLOTYPE.—E. X. P. For initial experiments use your friend's small Albion Press. That form of press, we know, is still used exclusively by one English house that turns out excellent collotype work. When you have acquired some proficiency, you should go in for a proper collotype press.

STUDIO.—P. R. O. F. You omit to say what the studio is required for. If it is for portraiture, decide upon either designs 1 or 3, according to the aspect—not stated. If it is required solely for copying, or reproduction work generally, then No. 4 will be, on the whole, the best. No. 2 is not well adapted for either.

MICRO-PHOTOGRAPHY.—MICRO says: "Would you kindly let me know if you have ever given directions in your paper for making micro-photographs, similar to those sold in penholders, tiny opera glasses, &c.? If so, please state the number it was in."—In reply: There is an article on the subject in the JOURNAL of May 1, 1896.

DAMAGED LENS.—C. J. R. The best thing to do is to send the lens to its maker to have the broken glass replaced. If you send it to any other optician, it is more than probable, if the new glass is made exactly as the fractured one was, which is somewhat doubtful, it will cost more than if the maker of the instrument supplied it.

PINK TONES.—J. DAVIDSON says: "Please say how this pink tone of enclosed print may be obtained. Is it in the treatment before toning, or by using any special toning bath?"—Such tones may be obtained by using a vigorous negative and a paper containing a good amount of free nitrate of silver, and stopping the toning at an early stage. The negative is an important factor in the case.

LENS OR CAMERA?—C. BILLING. The print enclosed shows very clearly that the negative is a long way from being sharp; but is that the fault of the lens or the camera? These, you say, are from different sources, and are both of the cheapest, or lowest-price, description. If the focussing screen and the dark slides are in register, the lens must be very faulty indeed, but possibly they are not. Prove whether the camera is right before condemning the lens, though it is a low-priced one.

HOLIDAYS.—OPERATOR writes, asking what is the rule amongst photographers with regard to annual holidays, and how long is usually given after a year's service?—There is no rule at all in the matter. Many employers give no holidays at all, some give a week, some a fortnight, or more. Unless "Operator" stipulated for a holiday at the time of his engagement, he is not, from a legal point of view, entitled to any at all, whether at his employer's expense or his own.

CHLORIDE OF GOLD; TONING.—CHLORIDES asks: "1. How to convert a half-sovereign into gold chloride? 2. If you will give a formula for a one-solution combined toning and fixing bath for P.O.P. prints?"—1. Simply dissolve the gold in a mixture of 1 part of nitric acid to 5 parts of hydrochloric, diluted with an equal bulk of water in a glass flask, using a gentle heat to aid the solution. About an ounce and a half of the diluted acids will be required, or, perhaps, a little more. When the solution is complete, crystallise in a Berlin or glass dish on a water bath. 2. See page 953-4 of the ALMANAC.

QUESTIONABLE PHOTOGRAPHY.—H. COLEBROOKE. If you were caught in the act of "snap-shotting" a private picnicing party without permission, we are not surprised that your action was vigorously protested against, and that some of the gentlemen did seize your dark slides and empty their contents on to the grass. Of course, this was a technical assault, and you can take proceedings against those who took part in it; but our advice is, "Don't," because the proceeding on your part was very discreditable, and would be condemned by the Court. As a further bit of advice, we would say, "Don't do such a thing again."

DENIER PICTURES.—F. GUTEKUNST writes: "In your issue of July 30 mention is made of photographs shown by Denier some years ago. Being desirous of learning more concerning them, we write to you for advice. Was the process patented? If so, could specifications be procured, or could you place us in communication with Denier, or suggest the means of ascertaining or, if possible, secure a sample of the photographs? Kindly advise us on the subject."—The process was not patented, neither was it published by Denier. The pictures were shown so long ago that we have no idea where any specimens are. However, effects similar to Denier's were produced by other workers by the method mentioned in the article named.

CARBON PRINTING.—ATLAS writes: "According to instructions, opal temporary supports for carbon must not be washed after being once waxed. I have several pieces from which the tissue washed away so much during development that I rubbed the remainder away with the hand under water; on others the waxing is streaky, or portions of the pigment remain after stripping. Please say how such plates may be thoroughly cleared for further use."—The best way will be to clean off the wax with benzole, and then thoroughly cleanse with warm water and soap. This treatment will give practically new glass. Then wax as if it were new glass.

BACKING SHEETS.—W. A. B. says: "At page 451 of your JOURNAL (vol. xliv.) you mention having some years ago described a simple mixture for backing plates. Could you kindly let me know what it is?"—In reply:

Gelatine	1 part.
Water	2 parts.
Glycerine	1 part.
Indian ink	*q. s.*

Make a paste, and coat paper; place the prepared material face downwards on waxed glass to set.

MARKED FILMS.—J. E. G. says: "I have had an experience that puzzles me. I have lately taken to using Thomas's A1 isochromatic films, and in double slides, some of which I had made for films only. At the top of the picture there is a band corresponding to the hinge, of reduced sensitiveness, but the puzzle is that, when using Edwards's instantaneous isochromatic films, in the same slides, there is no mark. How can I make the slides safe for the A1 films?"—Stains from the exhalations from the material used for the hinges of some slides is, or used to be, very common, and, the more sensitive the plates or films, the more prone are they to be affected by them. The only remedy is to get the hinges replaced by inert material.

COMBINED BATH.—H. HOWES says: "I should be obliged if you would give the formula for toning and fixing solution containing lead nitrate, 'alum,' &c.—In reply:

Water	10 ounces.
Hypo	4 ,,
Ammonium sulphocyanide	¼ ounce.

After dissolution add—

1. Alum	160 grains.
Water	1 ounce.
2. Lead nitrate	80 grains.
Water	1 ounce.

After boiling, filtering, and cooling, make up to 20 ounces, and before use add 1 grain of gold chloride for every 8 ounces of bath.

BLACK AND WHITE.—AJAX says: "I want to photograph letterpress, getting the letters perfectly clear glass on a very dense background. I find great difficulty in getting all the letters equally clear. I enclose a print. You see that the lower half of the plate does not print so well as the upper half. When developing, I noticed that the letters Y were developing up before I got sufficient background. As the card of letters was reversed on the easel, the letters Y were at the top. They seem to have got more light than the others. The photograph is nearly full size. I shall be grateful for any hints. There seems to be no handbook on copying. I have tried exposing in bright, but not full, sunlight, but I don't succeed much better. Perhaps wet collodion would do better. Will you please say in which year's ALMANAC a full account of this process was given?"—The fault in the example sent is that the original was not evenly illuminated. The wet-collodion process was fully dealt with in the ALMANAC for 1896; but, with that process, unless the subject is evenly illuminated, equal density of the negative must not be expected.

STAINED AND SPOTTY PRINTS.—J. KEVERISH writes: "I enclose you two prints, and would feel ever obliged to you if you would be so kind as to give me your opinion on how they are gone like they are. I feel certain myself it is the fault of the mounts, as these are a new lot of mounts we have just got in, and all the prints that we have mounted on them went like enclosed ones at once, and we mounted a lot at the same time on our old dark-green mounts that we had left, and they were all right enough, and all the prints on glass, &c., are as perfect as they were the day they were done. One of these prints is on gelatino-chloride paper. I make a fresh bath for each batch of prints; the bath is as follows: Water, 20 ounces; sulphocyanide of ammonia, 30 grains; gold, 2 grains to every sheet of paper; and, after they are toned, I wash well before putting in hypo. I make fixing bath up: 4 ounces of hypo to every pint of water, and fix for fifteen minutes, then wash well for an hour. The other print is on ready-sensitised albumenised paper. It is well washed, as usual, in three or four changes. In the third water I put 1 ounce of washing soda to 20 ounces of water, then wash again before toning. They are toned then as follows: Gold, 1 grain; acetate of soda, 20 grains; water to 8 ounces; then washed well before putting into hypo. Fixing bath made up as follows: Hypo, 4 ounces to every pint of water, and I put a few drops of liquor ammoniæ in; I always fix my prints fifteen minutes, to make sure that they are fixed, and kept moving all the time, face up one way, and face down then. They are then taken out of fixing bath, drained, then washed for an hour or more, never under an hour."—If the mounts are suspected, why not test them by the method so frequently given in the JOURNAL? That would satisfy you on that point. Most of the spots have a large nucleus, and it hardly seems likely that they are due to the mounts. An hour's washing seems very short, if many prints, 10×8, are dealt with at a time, unless they receive very careful attention the while.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

The thirty-seventh issue of The British Journal Photographic Almanac will be published on December 1 next. It is already in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the Almanac. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us list of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the Almanac is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the Almanac are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

With reference to our recent remarks on the subject of the Great International Photographic Exhibition to be held in April, 1898, at the Crystal Palace, we have received several communications, from members of the trade and others, which we may conveniently answer and comment upon here. Naturally, although preparations for the Exhibition are already afoot, the fact that seven months have yet to elapse before it opens is sufficient to explain the circumstance that sundry matters of detail are not yet generally familiar to those who have not been concerned in the preliminaries of the project.

* * *

We are asked to give, among other information, the names of the members of the Executive Committee, who, in conjunction with the Royal Photographic Society, are organizing the Exhibition. Here is the list:—

Captain W. de W. Abney, C.B.	Chapman Jones.
Conrad Beck (R. & J. Beck, Ltd.).	J. C. S. Mummery.
	G. Scamell.
F. Bishop (Marion & Co.).	J. Stuart (Ross & Co, Ltd.).
F. A. Bridge.	P. L. Waterlow (Waterlow & Sons).
H. H. Hay Cameron.	
The Earl of Crawford.	J. B. B. Wellington (Wellington & Ward).
T. R. Dallmeyer.	
J. J. Elliott (Elliott & Fry).	H. Wilmer.
W. Gamble (Penrose & Co.).	W. J. Wilson (Paget Plate Co.).
A. Haddon.	
F. W. Hindley (J. Fallowfield).	Sir H. Trueman Wood.

* * *

The representative nature of the Committee will be seen at a glance. The interests of photographic science, professional

photographers, dealers, apparatus makers, opticians, dry-plate and paper makers, amateur photographers, and photo-mechanical houses will be watched over by prominent members of the Committee. Broadly speaking, the Exhibition will consist of some half-dozen sections, covering the entire field of photography in all its phases. We lay stress upon this point. Carried out on the lines that have been laid down, the Exhibition, in virtue of its completeness, will constitute an objective illustration of the position of modern photography—scientific, manufacturing, industrial, and artistic. It should, and doubtless will, attract a very large attendance of the photographic public by reason of the fact that so comprehensive an exhibition has never before been attempted.

* * *

We are also asked to indicate the extent to which promises to support the Exhibition has been received. Many of the principal houses in the various branches of photographic industry have given in their adhesion, and with this support as a basis the success of the Exhibition is assured. We anticipate that as the time of opening approaches few firms will be found to have held aloof. As to the pictorial, scientific, and other sections, no doubt need be entertained that these will be well patronised. Numerous foreign exhibits of apparatus and photographs are expected, and the other attractions of the Exhibition will be such that a large attendance may be confidently looked for.

* * *

The prospectus of the Exhibition will be issued in the course of a few days, and in the meantime it is encouraging to note that although as yet no attempt has been made at canvassing, promises of support have been received by numerous firms, in addition to those represented on the Committee, among them being the following:—

Adams & Co.	Houghton & Sons.
Autotype Co.	Marion & Co.
R. & J. Beck, Ltd.	Mawson & Swan.
Blackfriars Photo.	Penrose & Co.
and Sensitising Co.	Photogram, Ltd.
J. H. Dallmeyer, Ltd.	Platinotype Co.
Dollond & Co.	Sandell Works Co.
Elliott & Fry.	J. F. Shew & Co.
Elliott & Sons.	Talbot & Eamer
Gem Dry Plate Co.	Waterlow & Sons.

W. Watson & Sons.

* * *

In some quarters exception is taken to the Crystal Palace as the *locale* of the Exhibition, and it would be idle to deny that there have been grounds for this attitude. But, upon reflection, it will be seen that the probability of past experiences in connexion with the matter repeating themselves are extremely remote. The last two photographic Exhibitions held at the Palace were not successful, and consequently left a bad impression behind them. This is the reason why the selection of the Palace has so far not been viewed with universal favour. Next year's Exhibition, however, is not in the least likely to prove a fiasco. All the indications point, as we said a fortnight ago, towards a great success. It is realised that the names of its promoters is a sufficient guarantee that the successes of the first two Exhibitions at the Palace are likely to be surpassed in 1898—the promises of support already received assure so much—and thus no cause is left for abstention. We conceive it to be a duty to urge a hearty and undivided support of the Exhibition, and we are confident it will be forthcoming.

It is stated in a foreign contemporary that the late M. J. Jackson has made large bequests to several French learned societies, among which the Société Française de Photographie receives 100,000 francs. The money is presumably to be devoted to the furtherance of photographic science.

* * *

Our contemporary, the *Lancet*, recently devoted an entire issue for information to students who are about to commence the study of medicine. We note with satisfaction that the student is advised to take up photography, "because it tends to sharpen his powers of observation, to lead him to make faithful records, and to cultivate in him the artistic method. . . . . At most medical schools now dark rooms are provided, and other facilities afforded for taking photographs, since a knowledge of practical photography is found to be extremely useful in the dissecting room, in the post-mortem room, in the ward, and in the operating theatre, while the capacity to take a micro-photograph is essential to the practical study of bacteriology and physiology."

A FEW WORDS ON THE SHORT WASHING OF PRINTS.

Some time ago Messrs. Haddon and Grundy demonstrated that the hyposulphite of soda in silver prints could be washed out in a much briefer period than many supposed possible. Since then, we fear, there has been a tendency to curtail the washing to too great an extent, under the conditions frequently prevailing. Correspondents frequently ask if we consider the time of washing mentioned by those gentlemen in running water is sufficient to ensure stable prints, and generally quote what they have written on the subject.

At one time—now a long while ago—it was thought by many that prints could not well be washed too much, and that the more they were washed the more permanent they were likely to prove. As a consequence, it was quite a usual thing with conscientious professionals—and amateurs as well—to leave the prints soaking in water, running or otherwise, all night, so that from first to last they were in water from twelve to sixteen hours. This was, of course, unnecessary; but we apprehend there is now a tendency to go to the opposite extreme, particularly where the conditions for rapid washing are not complied with. It is now many years ago since we first pointed out that prolonged washing, or any soaking in water longer than was necessary, was absolutely detrimental to the stability of the picture, as well as to its brilliancy. Also that, with proper care and attention, prints could be as perfectly freed from the hyposulphites in an hour or less as they could be with many hours' washing.

We have before us, as we write, some portraits that were produced commercially during the "*carte-de-visite* mania" in 1862-3, and they still show no sign of fading. The establishment at which they were produced, we are informed, turned out from six to eight hundred prints daily, and the washing of them was always completed in a couple of hours, but it was carefully done. The prints were kept continually in motion by hand, and by changing them, singly, from one vessel of water to another, all the *employés* being engaged in the work. Warm water was also employed in two or three of the later changes.

In looking at the old paper negatives in the Crystal Palace Exhibition, one is naturally impressed with their permanence, though some of them are fifty, or more, years' old, and yet show

no signs of deterioration. The washing of negatives in those days was short, but it was very complete. Here is the method generally followed: When the negative was taken from the hypo bath it was closely blotted off with clean blotting paper. It was then put into water for two or three minutes, and again blotted off with clean paper. These operations were repeated several times, and thus the negatives were quickly—though perfectly—freed from the hyposulphite.

A doubt was just expressed as to whether the conditions for successful short washing were always fulfilled in the general method of working. Let us see what takes place in the fixing bath. The first action of the hyposulphite of soda is to convert the unaltered chloride of silver into hyposulphite of silver, which forms, with the excess of hyposulphite of soda, a double salt which is insoluble, if the latter is not in sufficient excess; if it is, then it freely dissolves. Now, it will be seen, that unless there is sufficient hyposulphite of soda, and time enough allowed for its action, the whole of this salt will not be got into the freely soluble state, and some of it will remain in the paper. Some of this may, possibly, be got out by a prolonged washing, but not in a short one. In the opinion of Messrs. Haddon and Grundy a strength of twenty per cent. for the fixing solution, and fifteen minutes for the time of immersion, are sufficient.

It is manifest, however, that if, say, half-a-dozen prints are immersed and kept moving for that period in, say, a quart of solution, the conditions are widely different from what exist if several dozens, as is often the case, are "fixed" in the same quantity of solution, which, in some instances, is used a second or third time. When a large number of prints are fixed in a small quantity of solution it is obvious, for the reason given, that a longer washing is required than when a small number is fixed in a large quantity of solution; because the prints in the former case, when taken out, contain a larger proportion of the hypo salts of silver, which may not be in a state of easy solubility in water, than the latter. This fact should be kept in mind, namely, that the more perfectly the prints are fixed—that is, the larger the quantity of solution used in proportion to the number of prints treated—the shorter may be the washing. Indeed, it has been demonstrated—first, we think, by Mr. E. Dunmore—that quite a decided trace of hyposulphite of *soda* has little or no influence on the stability of a print. It has been proved that if a print be thoroughly fixed and washed and then immersed in a fresh dilute solution of hyposulphite of soda, and dried, it would remain unchanged for many years; thus showing that it is the presence of the hypo salts of silver that causes the deterioration, rather than that of hyposulphite of soda pure and simple.

There is no question whatever that the shorter is the time of washing—so that it be complete—the better it is for the beauty of the prints, as well as for their stability, and the free use of "hypo" is an aid to short washing.

DIGRESSIONS.

No. XXI.—The Difficulty of Photography.

In this digression, within the limits of becoming liberty, it is proposed to digress more than usual. In fact, I propose to be simply the reporter of others. It will be a sort of eavesdropper's harvest at the Convention; and, as the observations have been curiously missed by other members of the press, they will not be stale news.

[*In the Exhibition Room. Yarmouth.*]

Wilson.—We meet again! How quickly the merry world goes round! We scarcely have time to consider where we are, to look for the winter that scarcely came, and the spring that blew itself out before it warmed us and became summer, than another Convention is upon us, and we are the better for the recollection of the brotherhood and innocent enjoyment of the last. Other things have found time to take place, but do not dwell in the memory as does the excursion to Bolton Abbey last year. If I may take a foreign illustration, I should say the influence of photography is like that of the god of love in the French couplet, "All of us are, have been, or will be under its sway."

Ransom.—Surely better expressed by the English poet:—

"All the world their service bend to Phœbus."

Wilson.—Well, I won't cap quotations with you. What do you think of this little show?

Ransom.—A capital and significant exhibition, quite worth the fatigue and time it takes to get to it from headquarters.

Wilson.—So far away that Conventioners have no chance of giving it more than a single hurried visit. Convention exhibitions should be so arranged as to absorb the odd minutes of the members, and, when all the odd minutes you have happen to you a mile or more away, it is a serious difficulty to put them in their proper place, however convenient the omnibus service may be.

Ransom.—Really, when one looks around, it seems a pity this room is not more crowded by visitors. A great many people have taken a good deal of trouble to contribute the pictures, and our President to gather them, and the whole effect is wonderfully adapted to hammer in the lesson the Exhibition at Leeds last year was apparently intended to teach. In that one the awe-inspiring mysteries were artfully, and perhaps amusingly, exaggerated, and not even an odd photograph or the suspicion of an advertisement was allowed to lie on the table, or, indeed, anything but flowers of the right colour, and the business details were not permitted to obtrude. The hanging was done in secret by the local committee, as it should be, before the door was open even to the President; but here Rumour says that early Conventioners had a glimpse of the President and the charming Presidentess working hard at the unpacking of the pictures, and the hanging of them, day and night, like honest carpenters who had never heard of trades unions, or eight-hour days.

Wilson.—I was sorry to hear it.

Ransom.—This show is more mixed than its predecessor. As a lesson it is perfect and touches the spot at a glance. As a show I would not admit the two kinds of photographs so close together, but as a lesson it was an exceedingly happy thought of the President—I suppose it *was* the President—to make one wall representative of modern photography in its most pictorial aspect, and, for contrast, its neighbour show what an exhibition used to be with the usual thing enclosed in white margins. Nothing could have been devised to better show the progress of pictorial art in photography since the institution of the Salon.

Wilson.—Do you notice that, although the pictures on the pictorial wall are numerous, how few are the contributors? Which reminds me, I have often wanted to ask you how you account for there being so few pictorial photographers, when the art itself is practised by so many devotees and the processes are so easily mastered?

Ransom.—A question often propounded, but difficult to answer. An influential member only yesterday asked me, What is the use of your pictorial photography if only about fifty men in the world can make a pictorial photograph? I won't say whether this is true or not, but surely the endeavour to be one of them has turned many an easy photographer into an earnest student, and improved the appearance of the art. The President, who may be counted among the fifty, but is not a thorough-going enthusiast, remarked, in his address, that "there has been, and continues, a general advance in the efforts to produce something more than a topographical representation of the subject," and, if Mr. Hinton is not joking in sending a quantity of his pictures as local views of East Anglian subjects, the Exhibition contains a great advance, even in local views. To answer the question in one way, I should treat it in the Scotch manner with another question, Are there so few? We are, how-

ever, now in bloater-land, and another answer is suggested by the genius of the place. Thus. A sort of likeness runs through everything that nature does. Nature sows many seeds, but brings few to perfection. In the hope of rearing a couple of herrings, to be converted into bloaters to grace our breakfast table, Nature will produce ten thousand, or, it may be, one hundred thousand eggs. "Think of that, Master Brook!" We need not then be surprised if many thousands of photographers are used up in unproductive experiments for every shining light whose handwriting is seen upon the wall. Now, if I were one of the latter, I should think this a thoroughly egotistical attempt to solve the mystery, and even now I only give it to you that you may have something to think of.

Wilson.—You have knocked all capacity for thought out of me, and left me gasping. I feel more like one of the hundred thousand than ever.

Ransom.—We understand how easy photography is, but we have not yet got to recognise the other end of it. Photography in its higher developments is the most difficult of all the arts or crafts. This is shown in a curious way. We have infant phenomena in all, or nearly all, the other arts, but not in pictorial photography. Take my own particular study. Music is full of maturity in infancy. It is perhaps scarcely fair to take an easy art like music to compare with photography, but everybody, more or less, plays some instrument, as everybody, more or less, practises photography, but they are alike only in universality. Children have been proficient in music, but never in photography. Handel played the organ at seven; Haydn mastered several instruments before he was nine; Mozart at the age of four wrote tunes, and improvised fugues at twelve; among the moderns, the powerful Von Bulow could break piano wires at a very early age; and we have more than enough of poor little premature prodigies and wonders in frills and knickerbockers, brought round the country to excite the admiration of the unthinking and the compassion of the thoughtful. Infant painters have happened, but few of them were really artists. Raphael painted the Ansidei *Madonna* at twenty-three, but who ever heard of a great photograph produced by a boy, or even by a girl? But, still, music must be regarded as the easiest of the arts; we never meet with boyish perfection in painting. There is only one of the arts more difficult than photography, or wants the same mature skill, that is billiards. You can see the whole Royal Academy for one shilling, but it takes half a guinea to see billiards in perfection. Chess is difficult, but is not in it with combination printing for bringing out your reserve powers. But this kind of argument will lead us to the contemplation of photography as the most difficult, and, in its perfection, most sublime of the arts. It would, however, become us to be modest, and not claim too much.

Wilson.—I am glad you admit that. Let me feel your pulse and take your temperature. You must remember that you are a long way from your doctor.

Ransom.—I will try to be calm, but it *is* such a subject! Let us try another serious theme to sober us. Were you at the Lantern Show last night?

Wilson.—Part of it. There came a time when I got tired of seeing what looked like a competition to find who could make the least faulty slide of an uninteresting portion of a highly restored abbey. Now, it scarcely seems worth while, after a hard day's work, to leave a half-finished dinner hurriedly and travel a mile to sit in the dark to see a dozen bad representations of the same thing. Is it the duty of the Convention to show that the art of slide-making is declining?

Ransom.—There were some better specimens shown towards midnight. We are, at least, unfortunate in lantern matters.

Wilson.—In "papers," any way, we are more fortunate than usual.

Ransom.—It is not the function of the Convention to be learned: but it must be taken for granted that we are learned at the proper time. It is not the time of year for learning. All wonderful discoveries are announced in the winter season. Not that the Convention is a bad place, in one respect, for learned papers, if there are any left over from the winter; for it consists partly of photographers who never at other times listen to the blandishments of Society Syrens (happy mariners!), and seldom hear anything of photography except from the doubtful veracities of the outside press.

Wilson.—You must excuse me asking a possibly simple question, What are Society Syrens?

Ransom.—It is a poetical term for Hon. Secretaries who beguile you into filling half an hour.

Wilson.— I am loth to leave you, but, after that, Good-bye.

Ransom.—You have said nothing about photography in colours.

Wilson.—The Lord preserve us! H. P. Robinson.

ON THINGS IN GENERAL.

That this year's Convention was an undoubted success no one will deny, and, if the country was flat, the proceedings were not. It was good to see our old friends Messrs. Haddon and Grundy to the fore, and, as usual, with contributions of high value to photographic progress, whether looked upon from a theoretical or a practical aspect. We are accustomed to look upon the classical researches of Messrs. Davanne and Girard, bearing upon the conditions of permanency in albumenised prints as almost beyond the reach of criticism, but Messrs. Haddon and Grundy show conclusively how different the conditions governing the French authors' conclusions vary from those to be taken into consideration when working with present-day materials. The latter gentleman found 1·3686 grammes of silver in a sheet of washed sensitised paper; the English experimenters had only ·3186 in a similar sheet, hence it is quite obvious that the use of a weaker fixing solution than Messrs. Davanne and Girard lay down would not, under the altered conditions, run counter to their principles. I am rather surprised to find that no comment is made upon one very singular aspect of the experiments described at Yarmouth; possibly the authors of the paper may be inclined to give us the benefit of their views in the matter. It will be seen that, when using hypo of 5, 10, and 15 per cent. strength there is more silver left in the paper when it has been fixing for ten minutes than there is when the hypo has only been acting for five minutes; this is most singular, it causes one to wonder whether any clerical error in misplacement of columns has occurred, the more so as we see that, when 20 per cent. hypo is employed, this apparent abnormality does not occur. Personally, I should like to know Messrs. Haddon and Grundy's opinion as to the use of carbonate of ammonia in lieu of caustic ammonia. I am writing away from my library of reference, but I well remember that many years ago Mr. Spiller found that hypo solution failed to eliminate the last trace of silver in the whites, but that by the use of carbonate of ammonia in the fixing solution this residuum was greatly reduced in quantity.

Mr. Gamble's paper on *Half-tone Work* was an admirable *précis* of a vast amount of theoretical and practical work on the due production and the effect of the "dot," and forms a complete popular account of the *modus operandi* of that greatest advance in photography of modern times, the production of a printing block from a print entirely by photographic and mechanical means.

Mr. Bishop's paper on *Photographic Copyright* was also an excellent piece of special pleading for the Copyright Union as against the popular idea that country photographers are not in it when their copyrights are infringed. I have a distinct recollection of seeing in these pages a statement by a well-known contributor residing in the provinces that their earnestness in looking after the interests of provincial members was shown by their entertaining, not to speak of their actually transmitting, as was the case, to the copyright owner, an offer from a pirate to settle the matter by paying a sum, about one-third of the amount that the owner had received from authorised users of the same picture. And, by-the-bye, I noticed that in the list of towns from which they had received communications in one month, there appeared five times the name of the town wherein the contributor in question lives; now, as he clearly must have written letters of complaint, it is evident that, if they are included in the five repetitions referred to, there is not much to boast of in their case.

I notice on p. 480 a correspondent complaining that he received only five shillings for two pounds' weight of residue from the hypo

ath. I can assure him that if he used the liver of sulphur with nything like discretion, that is to say, not using an egregiously nnecessary amount, the sum received is ridiculously insufficient, rovided, of course, that the residue was really collected, and did ot consist of dust and dirt that had collected in the receptacle vhile the real residue had been washed away. A pound of dry ypo residue (clean) is worth more than a pound of dry chloride, *i.e.*, rint washing residue.

The Dansac Chassagne bubble takes a deal of pricking before it ursts; it is evident that the selective absorption of the stain roper to the original colour is a figment, and that, in fact, the whole process is no more photography in natural colours than is a crystoleum picture, or any of the thousand-and-one adaptations and reinventions of the latter. The enterprise of the inventors, in their endeavours to utilise men like Captain Abney and Sir H. Trueman Wood in the exploitation of their precious process, strikes one with a feeling akin to admiration.

Mr. W. B. Bolton deserves well of photographers in his endeavours to resuscitate the reputation of albumenised paper. For permanency under suitable conditions it is unsurpassed by any of the more modern papers; I should not be wrong if I said it was unequalled in that respect. I hear from many sides of photographers who have gone back to "good old albumen," which fortunately does require both skill and experience to do good work with it.

There seems a deal of halation in the air, and about it I feel quite justified in saying that we have by no means heard the last word in the matter. There is something yet to be learnt about it. I have seen negatives taken on unbacked plates under conditions which it might be imagined were the ideal ones for producing the effect and yet not a sign of it was to be seen. On the other hand, I have seen clear and unmistakable halation on plates where every precaution had been taken to prevent it—plates stained, plates backed with almost every recommended material, one and all I have seen with halation writ large. I am surprised beyond measure at the remarks made by one member, at any rate, at the London and Provincial Photographic Association about collodion backing. What a plentiful amount of playtime he must have available when he can view with equanimity the loss of time which, even putting it at his own modest estimate, is involved in the scraping, or monkey-branding, of a lot of negatives to clean off the backing. We hear a great deal of late of the poor income of professional photographers, but there is little to wonder at in it if they have no more idea of the value of their labour than to waste it over mechanically removing the backing of a plate which ought to be spontaneously detachable.

I shall conclude my lucubrations by calling attention to a droll error committed by the *Lancet* (as quoted on page 507), which, referring to sunlight "during its journey to the earth," states that "it undergoes an important modification, for, in passing through the air, it is deprived of some of the red rays, while the blue rays pass on, a circumstance which explains the azure character of the sky." This is a very curious confusion of ideas. The blue of the sky comes from the reflection of light that is passing through space not on its way to the earth, while, of the rays that do pass to the earth, instead of the blue rays passing on, and some of the red being abstracted, the very opposite is the case. The red rays pass on, and the blue rays are partly abstracted.

FRED LANCE.

FOREIGN NEWS AND NOTES.

Gradation in Prints.—Dr. R. E. Liesegang draws attention, in the *Allgemeine Photographen Zeitung*, to the many variations that are possible with suitable exposure and development. Short exposure gives bromide prints a vigorous character, whilst long exposure tends to flatness. With chloride papers it is necessary to keep several varieties, if it is desired to obtain the best results from negatives of different qualities by printing out. Collodio-chloride lends itself best to hard negatives, whilst some of the gelatino-chloride papers are most suitable for soft negatives. But if gelatino-chloride prints are subjected to physical development, the control of gradation can be regulated as completely as in chemical development. Dr. Liesegang thinks this an even more important consideration than the saving of time, which was the primary inducement which led to the development of chloride prints. The effect of exposure on developed gelatino-chloride prints differs from that on bromide paper, and is its counterpart. Slight exposure tends to flatness, whilst full printing gives contrast. The developer may also be modified, the addition of water giving softness. But the quantity, as well as the composition of the developer, influences the gradation, and in this respect physical differs from chemical development, where quantity is not important. The more solution used, the slower the development, and the softer is the picture. This is explained, when we remember that the developer is the nascent silver. In the presence of a larger quantity of solution, the nitrate of silver is removed from the paper more rapidly, and the solution is more dilute than when a small quantity of developer is used. It is scarcely necessary to add, that a fresh developer differs in its action from an old one saturated with silver salt, and that temperature is likewise a factor in the result.

Zone Markings in Negatives.—Jaffe offers the following explanation of this peculiarity in *Die Photographie*. These markings are of frequent occurrence, and are even seen in wet plates prepared with an indiarubber substratum. Although indiarubber is of great use in preparing reversed negatives by the stripping process, many have abandoned it, on account of these markings. The photographer is prone to assign chemical causes. The silver bath may be changed and the markings disappear. The bath is said to be at fault, but this is only an instance of *post hoc, ergo propter hoc*. If the negatives are placed very close to each other on the drying rack, and frequently moved from place to place whilst still wet, or if they are frequently taken from the rack for inspection, then these markings will show themselves and be so pronounced as to render negatives with plain backgrounds unfit for use. But if the negatives are separated sufficiently, so that the air may have free access, and if they are allowed to remain on the stand till quite dry, then no marking will be perceptible, and the negatives may be intensified without showing any trace of them. The cause is purely physical and due to tension.

Halation.—Dr. E. Vogel discusses the merits of certain kinds of backing that are used to obviate this evil. It is impossible to counteract it completely, as there is not only reflection of light from the back of the plate, but a certain amount of diffusion of light in the gelatine film itself. A very effective backing is a mixture of lampblack and castor oil, or, as recommended by Cornu, oil of cloves, turpentine, and lampblack. These are, perhaps, the most effective backings, but they are so objectionable in practice, that they cannot be used when travelling, and to prepare or clean such a backed plate is one of the dirtiest operations in photography. Stolze recommended collodion stained with aurine. 100 grammes of aurine are dissolved in 200 c. c. of warm alcohol, and filtered. 100 c. c. of this solution are added to 300 c. c. of two per cent. raw collodion and 4 c. c. of castor oil. This backing of yellow collodion is very effective and convenient, but does not protect orthochromatic plates as much as might be desired, as only the blue and part of the green rays are absorbed by it. For orthochromatic plates the collodion should be stained with other dyes. Erythrosine is a good dye for the backing, when the plates used are sensitised with erythrosine. But Dr. E. Vogel specially recommends a mixture of acridin yellow and rubin (fuchsin). Dissolve 10 grammes of acridin yellow and 4 grammes of rubin in 120 c. c. alcohol (ninety-nine per cent.). Filter the solution, as the acridin yellow usually contains a considerable admixture of dextrine. Take 20 c. c. of the solution of dye and add it to 50 c. c. of a thick four per cent. collodion, and 2 c. c. of castor oil. The stained collodion thus prepared should be made up to 100 c. c. by adding alcohol and ether in equal quantities. This red collodion also makes a good coating for dark-room windows, or electric lamps.

Alum and Alum Fixing-baths.—Dr. E. Vogel also writes in the *Photographische Mitteilungen* concerning the frilling of plates in warm weather, and recommends these baths as a remedy. The frilling usually begins when the plate is transferred from the fixing-bath to the washing-trough. The simplest combined alum and hypo bath is prepared by adding one litre of a saturated solution of hypo to half to one litre of saturated alum solution; but, though it hardens the film, sulphur is precipitated, and this must be wiped off the negative. To obviate this difficulty, Lainer has recommended that the solution of alum should be mixed with sulphite of soda before adding the hypo. But, by mixing the alum with sulphite of soda, there is frequently a copious precipitate of alumina, as the "neutral" sulphite of soda is usually alkaline. But this precipitate may be obviated by the addition of a small quantity of acid to the

solution of sulphite of soda, before adding the solution of alum. The bath may be prepared as follows:—1 litre of saturated alum solution, 300 c. c. of saturated sulphite of soda solution, to which has been added 15 to 20 c. c. of glacial acetic acid. Mix and then add 1200 c. c. of saturated hypo solution. Alum fixing-baths are slower in action than ordinary hypo baths, and are not to be recommended unless frilling is likely to occur. In most cases an alum bath used immediately after fixing, without any intermediate rinsing, is sufficient. But a plain alum bath should not be used on account of the precipitation of sulphur. To each litre of saturated alum solution should be added 300 c. c. of saturated sulphite of soda, previously acidified with 15 to 20 c. c. of glacial acetic acid.

Varnish for Collotypes.—Ad. Berold recommends the following varnish in the *Photographisches Wochenblatt*:—

Powdered bleached shellac	25	grammes.
Alcohol	85	,,
Ammonia	65	,,
Boiling water	125	,,
Glycerine	6	,,
Dextrine	¼	gramme.

The shellac is first dissolved in the alcohol, the ammonia is then added, and the solution well shaken at intervals. The water, to which the glycerine and dextrine are added, is boiled and gradually mixed with the solution of shellac previously poured into a basin or other suitable vessel. Well stir, and set out to cool. When cold, filter several times. The addition of a trace of borax prevents any particles of shellac being thrown down. If large quantities are prepared, the dextrine may be reduced to one-thirtieth per cent. of the total quantity. The varnish keeps well, and should it become too thick, may be thinned by adding hot water with a little alcohol and glycerine. To varnish collotypes so that they may have the same finish as albumenised prints, float them on the varnish in the same way as for sensitising paper.

Stained Films and Green Fog.—Emil Höfinghoff writes to the *Photographische Correspondenz*, reiterating the advice he has frequently given. To avoid stain and green fog, he recommends that the negatives be washed immediately after development, and before fixing. This he affirms to be an infallible remedy, irrespective of plate or developer. As explanation, he remarks that thickly coated plates are most prone to stain on account of the larger quantity of gelatine. This is fresher and in more glutinous condition than in thinly coated plates, where the gelatine has suffered more during the preparation of the emulsion. The more glutinous films do not part with the developer as quickly, and retain it with more tenacity in the shadows where the bromide of silver has not been reduced. Consequently in those parts of the film where the developer is still retained, fixation is imperfect, and yellow stain or green fog appears.

ANOTHER WORD ON COLLODION BACKING.

Seeing that the plate-makers referred to by the editors and by myself have abandoned the particular collodion backing that formed the subject of complaint, it is rather like whipping a dead horse to show its demerits; but, as the whole subject has attracted—and, from its important character, very properly so—considerable attention, I should like to put before my readers some further considerations upon collodion backing. It will be remembered that the difficulty of removal was the point of complaint—the difficulty experienced with a particular brand as then sent out.

It is a little unfortunate that Mr. Henderson's conception of the amenities of debate should permit him (at a meeting of the London and Provincial Photographic Association, when I was not there to reply to him) to characterise what I had said on the subject as "ridiculous." (I am presuming he referred to an article by me.) Now, what I wrote is either correct or incorrect; so much talk amounts to nothing in the way of proof. The first point is—taking a 12 × 10, which I termed a "moderate sized" plate—what is a reasonable amount of time that a busy professional man might be expected to give to the process of removing the backing from plates exposed in one fair day's work? My own idea is that five minutes should be ample—there are backed plates in the market which do not require that time; however, I will admit that half an hour spent in removing the backing from a dozen 12 × 10 might not be considered too much time to waste. Now, is that enough to remove the backing from the particular plates referred to, or is it not?

If it is enough, I will submit to have my words called ridiculous; if it is not enough, I ask Mr. Henderson to retract. How is it to be proved? I will send an original unopened packet of the plates in question—12 × 10 size—to the Secretary of the London and Provincial Photographic Association. If Mr. Henderson (privately in his presence, or in public at the next meeting), after steeping the plates in water for ten minutes, or as long as he likes, will (by any abrasive method) in half an hour, without injuring the film, and without cracking or breaking any plate, *entirely* remove the backing, and also any stain produced by it, or any pieces of collodion adherent to the film, I will be at the entire cost of the plates, and I will give a guinea to the Benevolent fund in addition, provided, of course, that Mr. Henderson will provide me with an equal number of the same make of plates if he fail. As a matter of fact, I repeat what I said before—he will not be able to do it in an hour, far less half an hour.

The great point in the whole discussion lies in the fact that there are collodions and collodions. I quite appreciate the force of what my old friend Mr. W. B. Bolton says, but I do assure him that the backing I refer to will not come off in the way he suggests. But then Mr. Bolton is *au fait* in all collodion matters, and if he put a collodion backing on, he would be careful not to choose one that he knew would give a hard and closely adherent film.

I wish now to speak on the more general aspect of the case. Collodion stained to a suitable colour forms an excellent backing, and, if there were no ulterior considerations, it would be difficult to find a material to surpass it. But, unfortunately, for its value, there are important considerations. In the first place, if the backing be applied by the user he will find it difficult to get a suitable kind; he will run the risk of staining the film, old hand though he may be; and even if he get a suitable collodion, he will find it by no means an easy matter to remove it from the edges. I recently received a letter (thanking me for my paper on the subject) from the head operator of a well-known photographic establishment, describing in pathetic language the trouble he had had with this backing—how first he had tried ether and alcohol to remove it, and had made such a mess of his hands as prevented his attended a dinner party he had been invited to. And next how, after using a table knife, he found bits of film all over the place, some of them having alighted on and spoiled a batch of bromide prints (Jubilee pictures wanted in urgent haste). It is the possibility (whatever method of removal be employed) of these loose particles flying about and injuring paper or glass photographs that is such a bar to the use of collodion. Suppose a negative to be apparently clean, and free from particles; it is given out in the printing-room, the printer sees a small piece of collodion on the back, and he scrapes it off with his nail. By-and-by, after a few experiences of the kind, one or other of these bits is certain to find a lodgment and work mischief. Then, again, suppose the collodion to come off spontaneously in the developing or the fixing solution; it is very difficult to prevent some small piece becoming detached and attaching itself to the film, possibly without being noticed. It would not wash away of itself, and would be most difficult to remove from the dried negative. Even were it noticed, it is by no means a simple matter to get rid of it, and in any case there is so much loss of time.

I could go on for some time pointing out the disadvantages of collodion; but I refrain, lest I weary my readers. In conclusion, I strongly recommend every photographer who backs his own plates not to use collodion; I trust the plate-makers referred to will entirely abandon collodion for the purpose in any form whatever—lightly or closely adherent. I may again point out that for very many years I have been endeavouring by all means in my power to induce certain plate-makers to make a point of backing their plates, it has such great advantages. During all that period I have rarely used an unbacked plate for outdoor work; and though it is by no means a certain cure for halation, it has so many merits that my last words in this article are, let every user of plates see that they are backed, backed, backed! G. Watmough Webster, F.C.S., F.R.P.S.

HISTORICAL PHOTOGRAPHS IN THE PHOTOGRAPHIC SECTION OF THE IMPERIAL VICTORIAN EXHIBITION AT THE CRYSTAL PALACE.

III.

We shall this week deal with the glass pictures—negative and positive—of which there are a number of typical examples of early date. The first process on glass that came into use was the albumen process. It was published by Niépce de St. Victor in 1848. It consists of coating a glass plate with iodised albumen, drying it, and then sensitising it in a solution of nitrate of silver strongly acidified with acetic acid, washing

and drying it. After exposure the image is developed with gallic acid, to which a few drops per ounce of the sensitising bath have been added.

The albumen process is well represented in the Exhibition by Messrs. Negretti & Zambra, who show both original negatives of early date, as well as transparent, stereoscopic, and lantern slides of modern date. It is not surprising that the process is so well represented, seeing that Negretti & Zambra are the oldest workers of it in England. So long ago as March, 1855, the late Mr. Negretti read a paper on, and demonstrated the working of, the albumen process before the Photographic Society of London—now the Royal. The albumen process is seldom, if ever, now used for negatives, though for this purpose it has not yet been surpassed except for speed, as Nos. 246–7 demonstrate. Its chief employment now is in the production of the highest class of stereoscopic transparencies and lantern slides, of which frames 265–7 are capital examples. One of the noticeable features of albumen pictures is the extreme fineness of the grain; indeed, the image has more the appearance of a stain than an actual deposit of silver.

Another feature is the distinct way in which distance is rendered, both in the negatives and in the transparencies from them. On the same screen as these transparencies are some by Mr. H. N. King, and by Mr. Henry Stevens, by the gelatine process, which cannot be better represented than by these two gentlemen, therefore visitors have a capital opportunity of comparing the results by the two processes at the hands of their best workers. So they have of comparing them with excellent transparencies by the Woodburytype process—frame No. 243, lent by the Sciopticon Company, and No. 244 by Messrs. Williams Brothers.

Messrs. J. Mudd & Sons (not Dudd, as given in the catalogue) have lent a couple of negatives—Nos. 255–6, by the collodio-albumen, or Taupenot, process—introduced by Taupenot in 1855—taken by Mr. Jas. Mudd, who was perhaps the best of all exponents of that process. These may well be compared with the negatives by the albumen process, pure and simple, as being examples of the two processes at the hands of their very best workers.

The albumen process as now worked is often confounded with the collodio-albumen process, because collodion is used in it. But this is a mistake, as the collodion in the former process simply acts as a substratum for the albumen, and takes no part in the formation of the image; whereas, in the latter, it plays an important part, and adds materially to the sensitiveness of the plates.

The albumen process of to-day differs but little from what it was forty years ago, except that the plates are first coated with collodion, and, after washing, to get rid of the alcohol and ether, and, while still wet, coated with the iodised albumen and dried, and afterwards sensitised. This modification permits of the albumen coating being dried quickly, with the plates in a vertical position; whereas, before, they had to be dried horizontally. In the collodio-albumen process the plates are first coated with iodised collodion, and then sensitised in the silver bath, precisely as in working the wet-collodion process. They are then washed and coated with the iodised albumen, dried, and afterwards sensitised in a similar solution to that used in the simple albumen process. It will now be seen that with the collodio-albumen process we have two films, each containing iodide of silver, and in *the* albumen only one.

Although the albumen process was an exceedingly slow one, still, with certain modification it could be rendered a very rapid one. For example, in 1851, the late Mr. Fox Talbot succeeded, at the Royal Institution, by this process, in photographing printed matter pasted on a rapidly revolving wheel by the light from the discharge of a Leyden battery, and all the lettering was perfectly distinct.

In connexion with the albumen process is an interesting original letter in one of the glass cases (No. 282), lent by Mr. W. Lang, from Sir David Brewster relating to it, in which the writer says that the sensitiveness of the plates is much increased by the addition of honey to the albumen, and by placing a white ground at the back of the plate, also by the use of hot gallic acid for the development. In this letter it is mentioned that, with these modifications, portraits can be taken in from five to eight seconds. The date of this letter is September 10, 1850.

When the collodion process was first introduced by the late Mr. F. Scott Archer in 1851, its use was for a time chiefly confined to taking glass positives. There are some excellent examples of these pictures in one of the glass cases. Some lent by Mr. J. A. Forrest are very representative of general work about 1855. One by the late Mr. W. England of Niagara Falls, No. 340, and one, No. 338, lent by Mrs. Smith, are also good specimens. One lent by Mr. E. W. Foxlee, No. 347, is one that may now be considered a novelty. It is a glass positive vignetted and coloured, with powder colours, as were Daguerreotypes, and it is an excellent little picture. The collodion positives shown well exemplify what the positive process is capable of yielding, and that it must not be gauged by the works of the itinerants one meets with on the beach, or Kew Green, and suchlike places on Bank-holidays. In skilled hands the collodion positive is a beautiful process.

The collodion positive and negative processes are practically the same: a positive is a thin negative, and a negative is a dense positive. In producing a positive a short exposure is given, and the development stopped at an early stage. In the production of a negative a fuller exposure is given, and the development carried much further, and, if necessary, the image is afterwards intensified. In the positive process the silver bath and the developer is more strongly acidified than it is for negatives so as to obtain a white image.

The wet-collodion process, so far as negatives are concerned, seems to be represented by a single example, No. 277, lent by Mr. Foxlee, and taken by him in 1865. It is a direct portrait, 15 × 12, or larger, and is quite untouched, indeed retouching was not then in vogue, so that at that time the operator had to rely upon his skill, and that alone, for the result. This negative shows the class of work that was produced more than thirty years ago. It is interesting to contrast it with *untouched* work of the present day. By the way, there is one other collodion negative, and by the same worker, of Saltash Bridge while in course of construction, (1858), with the stereoscopic camera with which it was taken.

The inconvenience of working the wet-collodion process in the field greatly detracted from its use, as it necessitated the use of a dark tent and carrying about the necessary chemicals, &c., and methods were devised for keeping the plates moist so that they could be prepared at home, and used in the field. Messrs. John Spiller and William Crookes did that by taking advantage of the deliquescent properties of the nitrates of zinc and magnesium; Messrs. G. Shadbolt and Maxwell Lyte, by coating the plates with honey. Other similar substances were also used.

Mr. Robert Freeman Barnes, one of our earliest workers, was the first to devise an actually *dry*-collodion process. No. 30 is a frame of prints, about 12 × 10 inches, made from negatives taken by Mr. Barnes in 1854–5. They are all well-known views on the Thames, and although taken so long ago, in the earliest days of the collodion process, and by the first dry-collodion one, it would be a little difficult to beat these pictures with the most modern of plates. If we mistake not, Mr. Barnes was the first to use albumen as a substratum in the collodion process.

After Mr. Barnes' process, various other dry-collodion processes were introduced, in which the plate was washed, after sensitising, and then coated with "preservatives," such as tannin, coffee, beer, beer and albumen, gum, gum and gallic acid, *et hoc genus omne*. No. 202 is an example by the gum-gallic process by Mr. Frank Howard, who was one of the founders of the original South London Photographic Society. This gentleman has also lent examples of the collodio-albumen process and the wet-collodion process worked in the field. These pictures admirably illustrate what amateurs did in the early sixties.

Nos. 25–7 are the work of another amateur, Mr. Osmond R. Green, 24 × 18 negatives, taken direct in the field in 1867 on collodio-bromide plates of his own preparation. These pictures and their excellence have been commented upon before. They are alluded to again because there is no intimation in the catalogue that they were taken direct, as they are simply given as *View near Bettwys-y-Coed*, *Furness Abbey*, &c., and the majority of visitors naturally surmise from their size that they are enlargements from small negatives. These pictures have an additional interest, inasmuch as they are albumen prints, and were made about the period that the negatives were taken, so that they are now nearly thirty years old, and amply prove that albumen prints are not necessarily the fugitive things some would have us believe.

The collodio-bromide process, by which these negatives were made, was the joint invention of Mr. B. J. Sayce and Mr. W. B. Bolton, whose portraits (Nos. 12 and 13) hang in juxtaposition close to these pictures. It was the first emulsion process, and was first made public in this Journal in September, 1864, and it has since revolutionised photography, as it laid the foundation of the present gelatine process. The collodio-bromide process, as published by Sayce and Bolton, and by which Mr. Green produced his large negatives, is not the collodio-bromide process of to-day. Then the soluble salts remained in the emulsion, and had to be washed out of the film after the plates were coated. That was the way the process was worked for the first ten years of emulsion photography. In 1874, however, Mr. Bolton published, also in this Journal, a great simplification of the process, namely, that the soluble salts could be removed from the emulsion itself by pouring it into a

shallow dish, allowing it to set, and then washing them out with water. The emulsion is then dried and redissolved in ether and alcohol. That is the way the collodio-bromide process is now worked, though its employment is chiefly confined to the production of lantern transparencies. The same principle is also followed in getting rid of the soluble haloids in gelatine emulsions. By the way, No. 14 is a portrait of Dr. R. L. Maddox, the inventor of the gelatino-bromide process, 1871.

Nos. 268–71 are emulsion negatives and transparencies, by Mr. Leon Warnerke, on his collodion tissue, made 1875-6. This tissue was formed of alternate layers of indiarubber and collodion, the last being the sensitive collodio-bromide emulsion. Later on, Mr. Warnerke substituted gelatine for the collodion emulsion. These examples prove that there was successful film photography long before celluloid films were introduced.

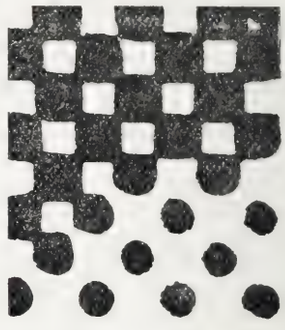
While on the subject of collodion emulsion photography, it will be well to call attention to three excellent pictures (Nos. 22–24) taken by Mr. G. Bruce, of Duns, and printed by the collodio-chloride process nearly thirty years ago. This process was introduced by the late Mr. G. Wharton Simpson in 1864, but till lately it has made but little headway in this country, though it has, we believe, been used almost exclusively by Mr. Bruce in his business from the first. The manufacture of this paper has mostly been confined to Germany, which still sends large supplies to this country, notwithstanding that its price is much higher than that of home manufacture. We do not notice in the Exhibition any examples of this process by English manufacturers. This is to be regretted, as we should then have had an opportunity of comparing the English make of the present day with that of the German, as used by Mr. Bruce five-and-twenty or thirty years ago. Any how, these pictures admirably illustrate the permanence of collodio-chloride prints, as none of them show the least signs of fading, These pictures also show that Mr. Bruce is an *artist*, and both *Work* and the *Wanderers* prove that *pictures* by photography need not be of the "fuzzy" order—the idea of some modern "artists."

HALF-TONE POSTERS.

In exhibiting some slides to illustrate my paper at the recent Photographic Convention, I called attention to the possibility of utilising enlarged half-tone negatives for the purpose of making blocks for poster printing. Posters are just now an artistic rage, and, though it may be that the half-tone poster, reproduced from a photograph, would not be accepted as "artistic," in that mystic sense of the word, definable only by those who know—or those who think they know—what is "art," I believe that such posters would be novel, and, for that reason, acceptable to the advertiser. It would provide a new opening for the photographer to make money on copyright photographs, and it would be a new field for the process worker—with square inches galore to charge up. One might go further, and say it would be a distinct public gain to place truthful photographic reproductions in close proximity to those fearful abortions of the human form at present depicted on the street hoardings. Even should the half-tone poster in monochrome develop into the three-colour-process poster, it may be doubted whether the latter process, at its worst, could produce such astounding incongruities of colouring as we now see put forth as the productions of artists presumed to have received training in the first principles of colour.

However, these questions need not be here discussed further. If it is found that half-tone posters can be readily produced, they will soon find their place on our hoardings, art or no art. The modern advertiser likes novelty, and he also likes cheapness; it is in these respects that the half-tone poster will appeal to him. There will be two half-tone posters where there was only one lithographic poster before, but I am not going to lay any claim to the *rôle* of public benefactor on that account. The idea of using the half-tone process for producing posters is, indeed, not novel, and several process firms are already engaged on working it out, whilst some have got so far as to produce very creditable results. I do not profess to know what method they adopt, but it is generally supposed that a coarse screen is necessary for the purpose—one ruled, say, fifty-five lines to the inch. But this would not be coarse enough for the thin ink used in poster printing. I have seen a poster of American origin in which the dots were about twenty-five to the inch, and did not appear obtrusively coarse, when looked at from a sufficient distance. A disadvantage of using coarse screens is, however, the lack of detail in the negatives taken through them. It is a rule of the half-tone process that the coarser the screen the less the detail, but the greater the contrast. The strong contrast obtained by coarse screens might be invaluable for poster work, but, when detail is lost, the screen becomes more in evidence. I think, therefore, it would be best to make poster negatives by enlarging from a negative of ordinary size—that is to say, to make a negative in the usual way with any average screen, and, from this negative, make a transparency, which, in turn, would produce the enlarged negative of any desired size. By this enlargement the dots will be proportionately made coarser, and thus the resulting block may be adapted to any grade of printing. I know the practical half-tone operator will raise all sorts of objections to such a course, but, if he will try the idea, he will probably be surprised at the result.

It will very likely be urged that the dots will not be sharp enough for photo-mechanical printing, and that they will not be joined up enough. Both these anticipated faults will be remedied by the operator using a sharp and well-joined-up negative to begin with. I have many photo-micrographic enlargements of half-tone negatives up to 300 diameters which are quite sharp and dense enough to print from on to zinc. To prove it, I took one of them the other day, printed it by the albumen process, inked it up in the usual way with photo-transfer ink, developed, powdered it with dragons' blood, and etched it out to a depth sufficient for poster printing. Here is the result:—



At first sight this may be thought rough, but that is only a natural result of the enormous amplification of the most minute raggedness in the original dots. Let the reader, who has been looking at it from a distance of, say, ten or twelve inches, pin it up on the wall in a good light, and retreat to a distance of five feet or more. Then the dots will appear as clean, sharp, and symmetrical as in the best half-tone negatives, or as we see them in proofs from perfect half-tone blocks.

It would never be necessary to resort to such excessive enlargement as this, but I wanted to prove the extent it was possible to go. It is obvious, therefore, that in moderate enlargement it will be possible to get all the sharpness requisite. Naturally the half-tone grain looks very coarse and mechanical, enlarged to such an extent; but posters are not to be looked at closely, and, when fixed on the hoarding at a sufficient distance from the eye, the tones look continuous. Pin up the above test piece again on the wall, and retreat to fifteen feet, when we seem to see a suggestion of tone, as though it was a little square cut from a half-tone proof. Retreating to thirty feet, the dot effect is lost, and we see two continuous tones, a black and a half-tone on white paper.

A very interesting optical illusion may be made in this way. Copy a small head from the half-tone print of a group—say the Convention group, which would be a very suitable subject—enlarging until all detail is lost and the square dots are about one-eighth of an inch in size. A print from this enlarged negative will show no resemblance to a portrait, it will simply be a mass of dots of different sizes; but pin the print up on the wall and step back ten or twelve feet or more, and the portrait becomes visible. The illusion is very amusing when presented to any one who has not seen it before.

This teaches a very useful lesson in regard to working half-tone posters. It is evident that we should, to get the best effect, make the grain to suit the distance at which it is to be viewed. A half-tone of ordinary size in a book looks much more effective when viewed at such a distance that the half-tone grain is lost. Thus, if we would remove the reproach against half-tone that it is "screeny," we must make our screens finer and finer until the naked eye fails to distinguish the separate dots. It will be quite practicable to achieve this as letterpress printing methods and appliances improve.

Coming back to our half-tone poster, I reiterate that a picture produced in the way I have described would look very bold and vigorous in contrast, besides having an essentially photographic appearance, which would make it very novel. If, in addition, colours were added, so much the better, but even in monochrome the results would be very striking.

I advocate enlarged negatives in preference to direct negatives with coarse screens because, in the latter case, the posters will be limited to the screens, and, as these are pretty expensive in large sizes, it is not likely that very big posters will be attempted. Moreover, the operator will not find it so easy to work these coarse screens as he does the ordinary rulings.

As to the actual manner of making these enlarged negatives, I need not say much, as every practical photographer is supposed to be familiar with the principles of enlarging. It would be hardly practicable to make the negatives in the camera, owing to the enormous size of apparatus necessary to produce posters of the usual dimensions. A "double-crown" sheet for instance is 30 × 20 inches, and a "double royal" 40 × 25 inches. The best way way would be to fit up a solar camera, or enlarge by means of the lantern. Several of the large photo-engraving firms have dark rooms fitted up for direct negative-making, with the lens fitted in the partition wall separating the studio and dark room. Such rooms could very well be adapted for making poster negatives.

Etchers would find no difficulty in handling such large plates, the dots being so coarse. It would, of course, be possible to surface-print them by the zincographic method, but the advantage of etching the plates into relief is that the printing becomes quicker and less expensive.

On the whole, I think there is a decided opening for the half-tone poster, and that it is quite possible to fill that opening. There are, no doubt, plenty of photographs in existence, or which could be made specially for the purpose. Some of the photographs of the "fuzzitype" school would answer admirably as posters, because it would puzzle the public to know what they represented, and that seems to be a desirable feature in the modern poster.

WILLIAM GAMBLE.

PHOTOGRAPHIC WORKERS AT WORK.

XVII.—THE GEM DRY PLATE COMPANY, AT WILLESDEN GREEN.

ALTHOUGH one of the youngest of the dry-plate making firms, the progress achieved by the Gem Dry Plate Company, since its formation nearly two years ago, has been great and continuous, and we at once saw on a recent visit to the Company's establishment at Willesden Green that the activity of the staff was such as gave the surest indication of plenty of business.

The sylvan beauties of Willesden Green are rapidly disappearing before the inroads of new railways and rows of villa residences; but the position of the Gem Company's works is nevertheless advantageous for the purpose—the open country towards Harrow and Wembley lying, as it were, at its very doors. The factory consists of a range of buildings two stories high, surrounding three sides of an open space 150 × 50 feet.



The illustration gives the reader an idea of the extent of the premises, the three-storey building that is shown being 60 × 30 feet, and, in all, eighteen large and lofty rooms are available for manufacturing purposes. The whole of the premises are heated by steam, and the space available readily admits of any extension of the business in the direction of coating paper that may in the future be decided upon.

The ground floors, which are all concreted, are used as wash-houses for the glass; coating room, and working laboratories for the preparation, steaming, and storage of the emulsion. The upper floors are devoted to drying, cutting, and labelling rooms. It is in contemplation to adopt machinery for cleaning the glass, and a brisk demand for the Company's plates renders other additions to the manufacturing resources necessary, especially in the direction of facilities for drying. An Edwards's coating machine is employed, and it is possible with it to take off over 1000 whole-plates an hour.

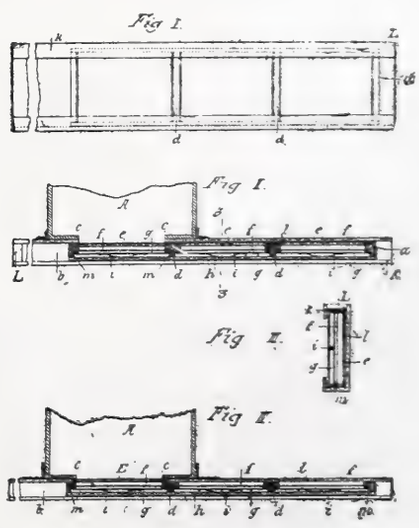
The points of similarity in English dry-plate factories outnumber the points of difference; but, notwithstanding the general resemblance, it is always easy to observe little matters of detail in which some novelty or new departure is perceptible. We spend some time watching the coating machine at work, and admiring the singular evenness of the spread emulsion, and are then piloted to the examining and cutting room. These two operations are usually conducted by separate staffs, but at the Gem Works the plate is examined and cut by the same *employé*, and time and labour are further economised by the plates also being wrapped up in the same room, ready for transmission to another department for final packing. This concentration of labour has the advantage of preventing the plates passing through a needless number of hands.

The upper floor of the main building is occupied as an experimental laboratory, and here we find our old friend Mr. E. Banks, who is known to our readers as an able photographic chemist and experimenter, installed as consulting chemist of the Company. The Hurter & Driffield system of speed determination has been adopted by the Gem Company, and the daily readings of all batches are taken by Mr. Banks. The tests adopted by the Company do not end here, the photometer being supplemented by a Warnerke sensitometer, while a camera test is also made by the aid of a Wynne's exposure meter for taking the value of the light. Thus each batch of plates before it is sent out is subjected to three tests, and the trial plates are carefully preserved for future reference if necessary. We had an opportunity of studying many of these tests, which spoke well for the good qualities, speed, and uniformity of the Gem plates.

This season has been the most successful the Company has had. Mr. T. E. H. Bullen, the founder of the Company, not only controls the business department, but also superintends the manufactory. We, as it were, followed the preparation of the plates *ab initio*, and were impressed with the great care expended in the manufacture. The severe tests to which they are subjected ensures plates of good and regular quality being sent out, and this, with the steady growth of business, makes the prospects of the Gem Dry Plate Company look extremely bright.

DARK SLIDES FOR COLOUR PHOTOGRAPHY.

DR. GUSTAV SELLE has devised a multiple slide which is especially intended for receiving sensitive plates for the production of negatives for coloured photographs. This case is distinguished from the usual multiple slide case by light filters being arranged before the plates, so that by simply displacing the case not only the plate but also the light filter is changed. By means of the quick succession of photographs of the same object effected in this manner it is possible to take successive views of living beings without difficulty suitable for the process of colour photography. The arrangement of the light filters closely before the sensitive plates in a multiple slide for the production of coloured photographs, has also the advantage, that the different refraction of the variously coloured



filters will no longer unfavourably influence the coincidence of the pictures when superimposed.

Fig. 1 is an elevation, and fig. 2 a sectional plan of such dark slide; fig. 3 is a cross section on line 3—3; fig. 2 and fig. 4 is a sectional plan of a modification.

As fig. 1 shows, the case, *a*, is divided into three parts, and is displaceable in a guiding frame, *b*. The guiding frame, *b*, can, as shown in fig. 2, be connected permanently with the apparatus, A, or, as shown in fig. 4, it

can be secured temporarily, for instance, by means of a groove and feather.

When the guiding frame, *b*, is connected permanently at an aperture, *c*, which can always remain unobstructed, in order to give to the projected light access to the sensitive plates. The case, *a*, is divided into three parts by means of bars, *d*. Each of these parts has towards the apparatus a slide, *e*, which can be conveniently pulled upwards. Behind the slide, *e*, are the light filters, *f*, which, when necessary, will be preferably exchanged from above. Closely behind the filters, *f*, are the sensitive plates, *g*, which are conveniently seated in metal angles, *m*, and can be taken out through a common door, *h*, and are pressed on the metal angles, *m*, by means of springs, *i*, when the door, *h*, has been closed.

The guiding frame, *b*, is shown in fig. 3 in cross section; it is closed below, open above, and provided with a bar, *k*, which prevents the dark slide from falling out. The cross bars, L, prevent the slide from being pulled out while the slides, *e*, are pulled up, so that the latter must be closed under any circumstances before the back, *a*, is pulled out of the guiding frame, *b*.

To remove the case and the guiding frame, *b*, together, as is shown in fig. 4, it is only necessary to provide the opening, *c*, of the latter with a slide, E; the single slides for each division can then be dispensed with as the wall, *l*, of the framing, *b*, lying towards the apparatus closes the sensitive plates on the front. Otherwise the case is constructed in the same manner as that shown in figs. 1, 2, and 3. The case can be slid forwards during the three exposures by hand or automatically.

THE WAGES OF PHOTOGRAPHIC ASSISTANTS.

When, some months ago, I wrote to the Journal commenting on the low wages paid to certain assistants, a correspondent, in denying my statement of fact, based his denial on the assumption that I was ignorant of the prevailing rate of wages. He concluded that I was a wage-earner, and therefore had no means of learning anything about wages, and had no right to comment on the wages paid by employers, who are supposed to possess a monopoly of such knowledge, and are considered the sole arbitrators in deciding what wages an assistant ought to receive. Why a man who is in receipt of wages should be the person ignorant of the rate, or the special advantages of confining the knowledge to employers, my critic did not make clear. It is a fact that employers have always maintained the utmost secrecy in respect to the wages they paid, believing that this policy gave them some advantage in dealing with assistants who were kept in ignorance. This belief, like many another, is simply a superfine deduction from imaginary data, and cannot be demonstrated as matter of fact. In the leading industries of the country the secrecy has long been broken down, and no violent catastrophe has followed the event; it still lingers in photography and some minor trades because they are not conducted on the lines of the later economy. Secrecy may have been useful in its day, but at present, even if desired, it could not be maintained, since, with the growth of trade unionism, the general rate of wages is made a matter of common knowledge. Considering the question broadly, it must be admitted that, under present conditions of trade, this is an advantage, for it facilitates commercial operations. The more general knowledge that can be brought into business transactions the more easily are they conducted, and the more likely are they to be profitable. It is not unlikely that even now the photographic profession is suffering because of the difficulty of obtaining reliable information concerning its undertakings. The extravagant ideas some persons hold in respect to its profits cannot be otherwise explained.

Holding the above to be sound, I do not hesitate to proceed from my articles on wholesale and retail prices, and consider wages as one of the factors in determining profits.

Wages form the largest item in the working expenses of a photographic business, hence on their economy will largely depend the proportion of profits; by "economy" I do not mean parsimony, nor cutting them down to the lowest level, believing that it is oftentimes "economy" to pay too much in wages, and never "economy" to pay too little. We must consider the interest of employer and employed as identical, that is to say, it is to the advantage of both that their common occupation should be carried on to yield the highest proportion of profits. This, of necessity, implies that the assistant is thoroughly efficient and capable, for all will agree that the value of a man's labour in production depends on physical strength, or energy, knowledge, and mental ability, moral character. Hence wages are not economical when they are so low that the assistant cannot acquire, nor maintain himself at, the highest level of efficiency; likewise, wages are not economical to an employer when they are too low to command the services of the most efficient workmen. Labour is thus the same as any other commodity, to obtain the best value an adequate price must be paid; if not, the efficiency is less, and the resulting product less in amount or poorer in quality. Prices are, therefore, lower.

From this it follows that a comparison of wages at various times will, in itself, give a general idea of the prosperity of a trade; for, when wages are high, profits will be high; when wages are low, profits will be low. Contrary to what many think, low wages do not mean high profits, or, in business language, when wages are cut fine, prices also are cut fine, and the margin of profit is curtailed. How far wages fall with profits, and profits are kept up by high wages, is of some importance to decide, but hardly comes within the scope of a photographic paper.

In dealing with wages I have pursued the same method as in dealing with prices, having drawn up a comparison between the rates in different years. In the table these are for the years between 1883–6, and for 1897, divided into three classes, the first being the wages for men of the highest skill; the second for men of medium ability; the third for the worst paid. The rates for 1883–6, although compiled from actual quotations, both by employers and assistants, may in one or two instances be a trifle under or over estimated; taken throughout, I consider them to be fairly accurate. For 1897 they are more reliable, having been compiled from several hundred quotations, the possibility of error being thus eliminated. In some instances the rates may appear too low, in others not low enough, as I have not put down the lowest quotations, nor included the wages paid to managers, &c. Rumours have occasionally reached me of operators taking 10*l.* 10*s.* per week, and retouchers luxuriating on 400*l.* per annum; these flourishing individuals abbreviated by the less fortunate into "lucky beggars" have not been revealed to me; should, however, a *rara avis* of this kind at any time cross my path, and a shattered constitution with a predisposition towards apoplexy, syncope, and other sciences, survive the shock, I shall immediately record the fact, for the edification of the profession in general, and as a bright example to aspiring photographic youth in particular; the prospect of receiving at some future time a salary of 546*l.* or 400*l.* per annum to a youth drudging on 15*s.* per week cannot but act as a spur to great achievements. The other side of the picture, I am sorry to say, is too real and too well proven to be dismissed as an invention of that "lying jade, Rumour." In my list I have not included the lowest wages collected, since I feel convinced that they are no measure of the value of the services offered, but are the outcome of the penniless condition of those willing to accept them. These low rates do not always come from assistants, as many that I have obtained are from employers. The following list gives the highest and lowest rate of wages for the present year per week:—

1897.

	Maximum.			Mininum.		
	£	*s.*	*d.*	£	*s.*	*d.*
Operator and Retoucher	3	0	0	1	1	0
Operator	3	0	0	1	5	0
Retoucher	3	3	0	1	0	0
Artist	2	12	6	1	5	0
Assistant operator	1	10	0	0	18	0
Printer	2	10	0	1	0	0
General assistant	1	15	0	1	3	0
Receptionist, spotter	2	2	0	0	10	0
Improver	0	16	0	0	10	0
Assistant printer	0	18	0	0	12	0

Comparison of Wages, 1883–1886 and 1897, per Week.

	1883-1886.			1897.		
	1.	2.	3.	1.	2.	3.
	s.	*s.*	*s.*	*s.*	*s.*	*s.*
Operator and retoucher	70	60	30	60	35	25
Operator	84	60	40	60	40	35
Retoucher	35	30	25	63	30	20
Assistant operator	30	25	20	30	25	18
Printer	30	25	20	30	25	22
General assistant	30	25	21	35	30	25
Receptionist, spotter	18	15	10	30	25	10
Artist	50	...	...	50	40	25
Improver	...	...	...	16	15	10
Assistant printer	...	...	...	18	12	—

The most striking feature in this comparison is the decline in the wages paid to combined operator and retoucher, and to the operator, more especially in the second class, in this case amounting to as much as 25*s.* and 20*s.* per week. This I account for in part because the operator-retoucher is no longer employed, the duties having been divided, which is borne out by the fact that the table brings out clearly the advance of the retoucher at the expense of the operator. Since the introduction of gelatine dry plates, the retoucher has become more skilled; his wages have therefore risen, and the highest quotation I have found for 1897 is 63*s.* for a retoucher.

The assistant operator and printer seem to have stood still. The general assistant has had a slight advance, and this is explained by the

growth of the specialist, since, in an age of specialism, the man who can do everything moderately well is more valuable, as such men are scarce. The receptionist and spotter has also advanced, and this is likewise accounted for by the growth of trade, and the consequent need of persons of greater ability and better education to manage in the reception-room.

The only actual decline is thus in the wages paid to operators, and probably this decline will continue until they are but little in advance of the wages of a first-class retoucher, printer, or artist. Retouchers' wages are even now better than operators', and, with the general use of platinum and other papers, the wages of a good printer are rising, 2*l.* 10*s.* and 2*l.* per week being no uncommon rate. Putting aside portraiture, it is obvious that the gelatine dry plate has made operating much easier. In addition, a large part of modern operating consists in mechanical exposures and development for process work, &c. For this kind of work less ability is required, and, of course, the wages of operators fall. On the other hand, retouching, printing, and spotting have become more difficult, and wages rise accordingly.

Perhaps a study of these figures and what they imply will induce operators to moderate their pretensions, and cause them to cease from holding aloof from those they regard as inferior workers. Hitherto this attitude of operators has prevented the formation of unions amongst photographic assistants. If, however, operators wish to avoid a still further reduction of wages, they can only do so by combining their forces with retouchers, printers, assistant operators, &c., and other inferior workers.

As regards the relative rate of wages at the two periods, and the charge on the cost of production, there has been but little change. Taking the first seven on the list as the principal wage-receivers, the cost compares as follows:—

	1883–6.	1897.	
Class 1 ...	297 shillings ...	308 shillings ...	Increase, 4 per cent.
Class 2 ...	240 ,, ...	210 ,, ...	Decrease, 12 ,,
Class 3 ...	166 ,, ...	155 ,, ...	,, 6 ,,

First-class wages have thus gone up 4 per cent., second-class decreased 12 per cent., and third-class 6 per cent.; to the majority of photographers wages are 12 per cent. below the rates in 1883–6, the reduction falling chiefly on operators.

A fall in wages is in itself not a healthy sign, because for the last fifty years the general tendency in all profitable trades has been for wages to rise. From 1837 to 1887 it has been estimated that wages in nearly all trades have increased from 50 to 100 per cent., and the rise still continues. This would mean an average rise of 10 per cent. every ten years at the least, so that photographic wages, under normal conditions, from 1883–6 to 1897, ought to have risen 10 per cent. instead of declining 12 per cent. Operators are thus quite 50 per cent. to the bad in comparison with other skilled workers, and printers, whose wages have remained the same, are 10 per cent. poorer. JOHN A. RANDALL.

LATITUDE OF THE PLATE.

ON this subject Mr. Cadett has the following interesting remarks in *Dry Plates*: The question of latitude in a plate is one of far more importance than the average student of photography thinks; we often hear some of the better informed photographers remark that the quality of a wet-plate negative has never been surpassed by that of the modern dry plate. A few enthusiastic dry-plate workers who have never worked the wet-plate process, often say that there is greater softness and delicacy about a dry-plate negative than there is in a wet plate one. They even go so far as to say that the quality of negative produced by a rapid plate is better than that by a slow one; and there are some dry-plate workers who are even so ignorant as to say that such and such a plate is as "hard as nails" and lacking in gradation. Those who know better smile at the utter falseness of these statements, which are based upon pure ignorance. No plate is hard; our most delicate transparencies and negatives are often made upon plates having the highest development factor. These few remarks may seem somewhat of a digression from the subject of this article, but the question of the development factor in a plate is more closely bound with that of latitude than at first sight seems apparent. Theoretically, the question might be asked, even of a very experienced scientific photographer, whether a slow plate had more latitude than a quick one, and he would hesitate, from a theoretical point of view, before answering this question; from a practical one, however, there would be no hesitation in the answer, because within certain limits a certain development factor is necessary for proper printing value, and the slow plate has the enormous advantage of giving this printing density with a minimum of development, and in consequence less actual depth of action in the film by the developer before that printing density is produced. I was led to pen these few lines owing to the immense surprise, to say nothing of the instruction, I received from examining some negatives taken by Mr. Vero C. Driffield, of Hurter & Driffield fame. Mr. Driffield put into my hands a plate with two negatives upon it; he also handed me two prints from these same negatives, and asked me what had taken place. Now, while professing to know a thing or two about negatives, I looked upon those he handed to me with very grave doubts in my mind as to how they had been produced, and it needed his explanation to make me understand what he had done. These two negatives being taken on the one plate, were developed together for the same time; consequently, the development factor (as those who have had anything to do with the Hurter & Driffield system will understand) was the same for both negatives. One negative seemed a perfect one both in exposure and density, but the other looked so dense that it could be scarcely seen through; indeed, it looked a perfectly useless negative to the untrained one, and yet the development factor, as we said before, was the same in both negatives, the result being that the prints from each negative were identical in every repect as far as the most critical observation of the eye could discern. Mr. Driffield then explained to me that one negative had received one second exposure and the other one fifty seconds exposure, and yet gave identical prints in every respect, the only difference in the working of these two negatives being that one required an enormous time for printing. Within the period of correct exposure the opacity is proportional to the exposure (it is necessary here to say by opacity we do not mean density or deposit of silver, which Messrs. Hurter & Driffield say is proportional to the logarithm of the exposure), consequently, one negative had fifty times the opacity of the other, having had fifty times the exposure. Now what did this mean? It meant that with the exception of a lengthened time of printing, it was perfectly immaterial whether that plate had one second or fifty seconds exposure, and this we must understand without any alteration of the developer or time of development, both negatives being exposed and developed exactly for the same time. Here was a state of things that seemed simply astounding; but upon making a speed curve of this plate the surprise was met by a very simple explanation, which was merely this, that for the developing factor given, the straight line portion of the curve, or correct period of exposure, was so long, and embraced such a wide difference of opacity, that the limits we could obtain on an "Ordinary" print, say, roughly, within one to thirty, could be made with such a plate fifty times over.

Of course, it is well recognised now that enormous differences can be made in a plate by altering the developer; but the widest limits in practice may be fairly said to be embraced within six to one, and yet we are face to face here with the differences obtained merely by the latitude of a plate of fifty to one. Now, needless to say, this plate was an extremely slow plate, such as would be used for photo-mechanical purposes, well coated and very slow. As we advance in speed we find the practical latitude of the plate fall enormously, until at last, by increasing the speed, we find, within the limits of the range that any printing paper will give, we have no latitude left at all; and the plate must have exact exposure if we are to get a good negative. Now why is this? There is one point which bears very forcibly upon this matter; some time ago, in trying to ascertain the effects of time of development upon a plate (especially using a rapid plate), I found that in giving one minute of development, I obtained with the rapid plate from five to six points within the so-called period of correct exposure. Upon increasing the time of development with the same developer, two, three, four, and five times, there was a corresponding reduction in the number of points within which the straight line of the curve could be kept, and this, of course, was easy to understand. In a rapid plate, we are obliged to develop for a certain time in order to get sufficient density, or rather we should say *opacity*, of image in order to yield a good print. Now rapid plates for the same developer and time of development have very much less powers of giving opacity, consequently, we are obliged, as it were, to force development for such a time that the action of the developer goes right through the film, with the result that there is not sufficient silver to act upon in order to keep up the regular density factor, giving arithmetical deposits of silver with a geometrical progression of time of exposure. Now, with a slow plate with the same developer, we reach this printing density when the developer has acted for a very short time on the film, simply because the deposit on a film of fine grain is very much more opaque than that produced on a film with a coarse grain, and it is this ease of getting density on the slow plates which allows us to practically stop development long before it has reached the same depth of film that would be necessary in the case of a quicker plate. It is really wonderful to note the fall in opacity-giving power as the plate is made more and more rapid. We cannot say that theoretically the latitude is greater in one plate than the other, provided that opacity of image be not taken into account; but for a given opacity the latitude is enormously different in comparison between the slow plate and the quick one. This, therefore, gives us a far greater latitude, to say nothing of better quality, in the slow plate than we have in the fast one. In every case where the term hardness is used to a negative, it simply means that the developing factor is too high, and no matter however great the opacity-giving powers of a plate may be, this opacity may be made as soft and delicate as we wish by stopping development or modifying the developer, and, therefore, considering the fineness of grain in the slow plate, we have the power of making pictures of the greatest delicacy as well as the greatest opacity, whichever we may desire to do.

Where we want great latitude and fine quality, the slow plate is unquestionably the better one, the question of gradation has nothing to do

with the matter at all. Provided that we expose the quick plate with the right exposure, and give it the proper development in order to obtain printing density, we shall get a result in actual gradation not inferior to that possessed by the slower plate; but exactness in exposure becomes of great moment in the case of the quicker plate, for we have less latitude, and, therefore, for quick work we require shutters and exposure meters which may be adjusted with absolute exactness. The advantages of high speed are so great in practice, that the constant aim of the plate-maker must be to produce the greatest possible density-giving powers in a plate combined with speed.

PERSONALITY IN THE PORTRAIT.

Why should the contrast of expression upon the face of the photographer's customer going into, and coming out of, the studio be oftentimes so marked? And also be reversed, say, to that of the patient going into, and coming out of, the dentist's surgery? In the latter, the ultimate, cheerful, beaming benignancy is clearly due to anticipated pain passed well through; can it be in the former, on the other hand, that anticipated pleasure has been turned into—well, if not pain, something having a strong family resemblance, if the assured, smiling confidence of the entry, altered into the sulky and bored limpness of the departure, be any indication?

I fancy the explanation must be in the tedious and trivial treatment he has been subjected to, and the fashion in which his own individuality has been so completely sunk; owing, he tells himself—though with anything but pleasure—to the limits and needs of the technicalities of the process. The items, in the shape of arms and legs, that help physically to make him up, have been particularly arranged to suit, not his convenience and comfort, but the particular powers of a lens; his head turned into an uncomfortable position so as to be properly lighted; he has been told to look at a special spot upon the side wall for the due bringing out of expression in the eye or eyes; and, finally, had to keep his strained position and gaze in as statuesque a way as possible, until the operator saw fit to press the bulb, or uncap the lens—the which, by the way, he was not, either, in any particular haste to do.

Had the result justified all this fuss, there would be no need of saying anything further; but it hasn't. The submitted proof, it must be admitted, is all right as far as it goes—that is, as far as the good, orthodox photograph goes; but where is the sparkle of life and suggestion of individuality we would so much like to see?

Something must inevitably be lost in the attempt to represent life by means of a machine—the limits of photography be duly recognised; but are those limits, in ordinary use, true and natural ones, or are they more or less arbitrary, accepted as classical, partly from having been handed down in practice from past workers, partly from the fact that sufficient experiment has not been made towards their bettering or supplanting by others more elastic and artistic? Past workers in their day turned out good work, for that day, and when, probably, novelty was a material factor to help in a not over critical judgment of the result. But things are different now, and I contend that advance in this particular direction of portraiture has not kept pace with our increased and improved general photographic powers; and doubtless has a great deal to do with the general complaint of low and insufficient prices so prevalent at present.

Comparing a good portrait of twenty years back with one of to-day, can we see a satisfactory bettering as expressive of such advance made in speed of plates, construction of lenses, and so on? I think not. On the face of it, and bearing in mind the number of workers in the field, one is tempted to believe that a certain point is not to be passed—one represented by the best style of work in a good photographer's window—were it not that we now and again come across a picture which immediately proves the contrary, by springing altogether ahead of the accepted high-water mark, and really coming pretty near perfection.

It is no haphazard chance that has produced the exceptionally good result, and if it can be done occasionally, it can as a matter of ordinary course; but not by holding to rules and methods in present high and exclusive vogue. Two such—and ones better altered as soon as possible—are, the subordination of too much to the lens, and the taking too long and deliberate a time over the operating.

The first consideration—it goes without saying—in portrait work is to catch a natural position or pose; but personality is expressed by far too fine shades to stand the handling of the ordinary photographer, mainly intent upon giving his lens the best chance. If the characteristic feature be, say, a poise of the head, a thoughtful lowering of the brows, or the humorous mobility of a facial muscle, is it likely that it can survive the careful arranging of a head to gain a "Rembrandt lighting?" or a man accustomed to "spread himself" when at ease, is it possible for him to look natural, sitting closely and stiffly in his chair to suit photographic planes?

What are we to do? Must we develop into character readers, and artists, as well as photographers, to turn out "cabinets" at 17*s.* 6*d.* a dozen? It would, of course, be well if we could add these qualifications, but it is certainly a bit too much to ask for the price, or for a higher one. But one thing we can very easily do, which would result in a marked gain, viz., leave the posing as far as possible to the poser. He, given the widest margin of freedom, is far more likely to assume a natural position than the one the operator places him in, and, in doing so, retain the individual peculiarities it should be such an essential first aim to catch and preserve. If in doing so he do not show a large proportion of face and front, why seek to alter it to suit any set canon hitherto worked up to? A particular amount of face is not a *sine quâ non*; indeed, it is very conceivable that no amount at all need be; for it can safely be stated, that the reverse of many a medal is more interesting, and has more character about it than its face—and character is what we want, or should want, to portray. If the attitude be palpably an unphotographable one, a few short directions, with the reason for them, will, by an ordinarily intelligent man, be accepted at once with interest, and acted upon.

There should be a minimum of actual touching and arranging, even of dress folds.

Personally, from some cause or other beyond my control, I detest being lightly touched by anybody—it gives me "the creeps," and sours my otherwise generally acknowledged amiable temper. I believe that there are a great many people like myself in this respect; in any case, short of this violent dislike, no one, I imagine, can care to be fiddled with—have his head turned a little on one side, arm placed to lie in a particular position, foot shoved in a bit towards the body, and stand a final, deliberate, magpie judging of the result by the photographer from a distance. It makes one think too much of a draper's assistant arranging a dummy in the window, with oneself filling the part of the dummy.

Speedy working should be another feature, as closely aimed at as natural posing; for, granted an easy attitude and expression obtained, it is not likely to last through the ordinary, irritating shifting of the camera and its parts in focussing—very frequently the visit to the dark room to charge the slide, as well. There is no reason why the focussing should not be done beforehand, at least so approximately, as to mean nothing further at the critical moment than a correcting glance, and the turn of a screw; the shortest exposure possible, made as quickly and unobtrusively as practicable, and the work is done.

A good deal of what we hold as sacred in the existing photograph will have to be sacrificed, but it will be the sacrifice of the lesser for the gaining of the greater. The portrait lens that "speaks" may not be a practicable instrument under the suggested changed dispensation; but then if it "speaks" so unnecessarily as it generally does, I fail to see that its ousting from its present position need cause any great weeping and wailing. I cannot regard as of first importance such extreme definition, for instance, as we gain in our present use of it; flesh so faithfully rendered that we can make a fair guess as to what the sitter takes with dinner, or the texture of cloth so well brought out that a tailor could almost tell what a yard it cost. The impressions we carry of our friends are not such finely analysed-out ones as these; the eye does not go so minutely into things as the lens, but takes altogether a far broader impression, and a one we would come nearer to, and thereby reaching success, in getting rid of our close holding to this, and the few other studio rules at present in use, with their wooden, finnicking, meretriciously polished results, and going in instead for the breadth of a natural pose, freshly and quickly caught.

J. Rees.

EXPERIMENTAL RESEARCHES ON GLASSES,

Carried out under the Direction of the "Committee of Chemical Arts" of the Société de l'Encouragement.*

[Chemical News.]

The object of these researches, for which the proprietor of the glass-works at Blanzy, M. Solvay, and the Company of Saint-Gobain, kindly offered the use of their works to the Committee, was to determine the relations existing between the chemical composition of glass and its most important properties, such as dilatation, fusibility, tenacity, refrangibility, and alterability. The first part, which concerns dilatation, and has been done in conjunction with M. Chatenet, is now finished, and forms the subject of this article.

Very little work has till now been done on the dilatation of glass—that of Fizeau, Schott, and Damour being all that is worth recalling.

The tension of an enamel applied to a body less dilatable is easily found by the following equation:—

$$1-\Delta\,(T-t)=[1-\delta\,(T-t)]\left(\frac{R}{E}+1\right)$$

when Δ = the coefficient of dilatation of the body to be enamelled;

δ. Coefficient of dilatation of the enamel;

T. The temperature beyond which the enamel must not be raised without becoming permanently deformed;

t. The lowest temperature to which the enamelled body is reduced;

R. Tension of the enamel;

E. Coefficient of elasticity of the enamel.

* Abridged from the *Bull. de la Soc. de l'Encouragement*, Series 5, vol. ii., No. June, 1897.

Compared with metals the dilatation of enamel is almost always too ›eble, and if the tension due to the difference of dilatation is too great ›e adherence of the enamel to the metal may be insufficient to resist it, nd the enamel will crack off; but it is better, if the coefficients of dila›tion cannot be made to agree, that that of the enamel should be the ›sser, so that it remains under compression.

The measurements in all these experiments were made by M. Fizeau's ›ethod. The apparatus used was very completely described by M.)amour, modified by M. le Chatelier, in the *Bulletin* of February, 1896; he only important modification since this time has been the substitution f warming by means of water instead of by air. It consists of three ›oints of tempered steel, which serve as a support for the glass under xamination. Parallel to the base of this tripod, and 2 cm. from it, are hree levelling screws of hardened steel. The glass, cut into a prism of or 3 cm. high and polished on its lower surface, is placed on the tripod, nd adjusted by means of the screws in such a manner that its polished ace coincides almost exactly with the base of the tripod.

Under these conditions, if we place this over a biconvex lens, and lluminate with monochromatic light, we can observe Newton's rings. The prism and its support on the biconvex lens are placed on the top of vertical tube, at the lower end of which two prisms are arranged at its unction with a horizontal tube. The yellow light from a Bunsen is eceived on and totally reflected up by a prism, to the glass under experinent; from there it is reflected down the vertical tube again on to nother prism, fitted with a lens which again reflects it further along the ›orizontal tube, where the image of the rings can be examined on a screen ›y aid of a microscope.

On warming up the vessel containing the prism under examination and ts support, the rings at first appear very rapidly, and the black centres which appear are counted. After about three-quarters of an hour the equilibrium of temperature becomes established, and the rings no longer pass, and the temperature is noted. Each passage of a black centre corresponds to a difference in elongation of half a wave-length between he prism and its support. The dilatation of the glass in question is hen found by the equation—

$$\delta = \Delta \pm \frac{1472 f}{\theta} \times 10^{-8}$$

when Δ = Dilatation of the support;

f. The number of rings which pass;

θ. Difference between the extremes of temperature.

There may be a systematic error due to the graduation of the support, but this is reduced to a minimum by taking the mean of several experiments.

Most of the samples of glass used in this research were made in a Schlœsing furnace in a platinum crucible, then cast into triangular prisms 30 to 40 mm. long and of 8 to 12 mm. width of face, in moulds of clay or wood charcoal; they were then annealed at a dull red heat, and allowed to cool very slowly; when cool they were ground, and one end was polished. By using platinum crucibles there is no fear of any variation in the composition of the glass.

Our first endeavours were to try and verify the truth of the law connecting dilatation and chemical composition, which was admitted by Schott without sufficiently conclusive proofs; he thought that the dilatation of glass increased in a similar manner to density, by the simple addition of certain bodies. To decide this point we had to have recourse not to ordinary commercial glass of complex character, but to glass of very simple character, prepared in the laboratory, and of which the constituent parts varied in proportions as widely apart as possible. After becoming convinced of the inexactitude of this law, we tried to find some precise qualitative indications of the manner in which variations in a given glass affected its dilatation.

The curves made for the comparison of the results give to dilatation a function of the volume, and that seems more reasonable than to imagine a relation between dilatation and the weight of the component parts of the glass.

Silicates of soda and potash are vitreous, from the state of NaO, SiO_2 and KO, SiO_2 up to SiO_2; but when more alkaline than $NaO, 2\,SiO_2$ and $KO, 3\,SiO_2$, they become too hygrometric to allow of practical measurement of the dilatation.

All the silicates of lithium we prepared became devitrified. Contrary to what occurs with alkaline silicates, the dilatation of silicate of lithium increases with the proportion of silica: it is true that the mixtures are not vitreous, so this increased dilatation is probably due to the presence of crystals of silica; the mean dilatation of quartz is, in fact, very high, viz., 1206×10^{-8}.

Borates of soda and lithia can be obtained in the vitreous state, from the condition of $NaO, 2\,BO_3$, and $LiO, 3\,BO_3$, up to BO_3.

The only borate of zinc obtainable is $ZnO, 0{\cdot}67\,BO_3$, and this becomes devitrified very rapidly into cubic crystals.

One per cent. of boric acid is lost when heated to bright red for fifteen minutes, but this small loss does not interfere with the measurements of the easily fusible borates. The measurements made on a large number of samples of borates show that there is a very sharply defined minimum —that the dilatation decreases with a slight increase in the proportion of the bases; it reaches the minimum, and then increases rapidly. This is an important fact, and shows by itself that Schott's law is incorrect; moreover, the same was observed with more complex samples of glass containing boric acid.

As much as sixty-nine per cent. of boric acid can be added to white glass, but beyond that the excess separates out, and even with this high proportion the glass is not really homogeneous. Bottle glass devitrifies when there is more than fifteen per cent. of boric acid present, but even under the microscope there is no trace of crystallisation.

From the results shown in the table, it can be seen that the coefficient of dilatation of boric acid is about 350, and it is this figure that must be taken in considering the influence of small additions of boric acid in commercial glasses.

In certain cases oxide of lead is, like boric acid, capable of giving a minimum of dilatation; but the effect produced is never strongly marked, and does not appear to be general. By adding six per cent. of oxide of lead, M. Damour increased the dilatation from 514 to 551. It can be added up to sixty per cent. without devitrification in the case of bottle glass, but the glass is then no longer homogeneous.

Alumina, when in large proportion, has the effect of making the glass almost infusible: this necessarily limits its use. Oxide of lead seems to be the body which best dissolves alumina. The measurements made show that when increasing quantities of alumina are added a minimum of dilatation is reached, in the same way as with borate of lead. An interesting fact noticed is, that the separation of boric acid from PbO_3, $3\,BO_3$, and from $3\,ZnO, 2\,BO_3$, is stopped by alumina, although when in the crucible these borates are as liquid as water. Finally, the addition of small quantities of alumina to glass has the effect of lowering the coefficient of dilatation; this effect is more marked the more acid the glass is.

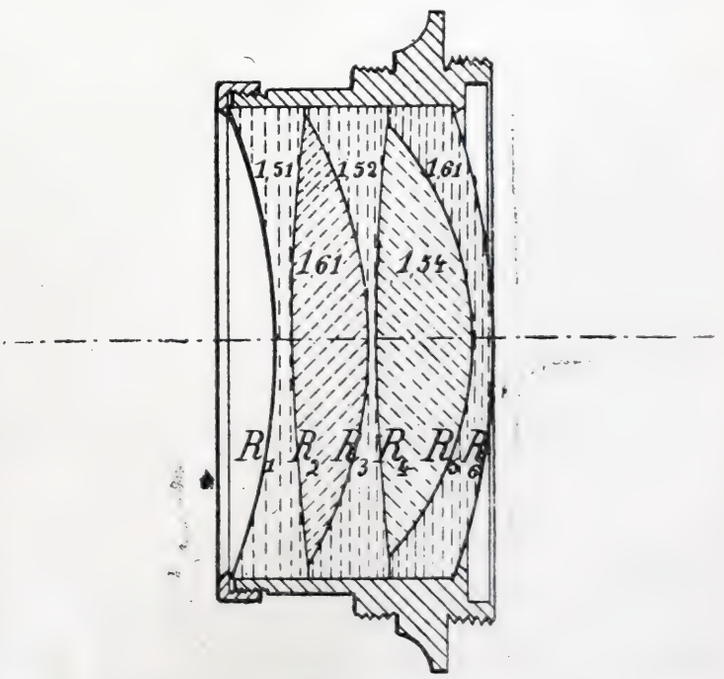
Some of the conclusions to be drawn from this research are, that a large number of bodies, such as BO_3, PbO, CaO, MnO, Al_2O_3, &c., when added to the glass in small quantity, lower the dilatation first to a minimum, and afterwards increase it as the proportion added is raised. This has not been observed in the case of potash, soda, or silica glass; possibly it occurs with such a minute addition as not to be practicable. Nevertheless the double silicates of potash and soda have a lower dilatation than the corresponding simple silicates. Alumina, while greatly lowering the dilatation, allows us, on account of the special fixity it communicates to glass, to obtain very alkaline silicates of high dilatation, offering great resistance to water.

Fluoride of calcium, in spite of the high dilatation given by fluorine, only increases it very slightly, and when the proportion added becomes at all large the glass is completely devitrified. To sum up, the bodies studied can be divided into two classes:—1. Those which increase the dilatation, KO, NaO, LiO, CaO, $P_2O_5, 3\,CaO$, $CaFl_2$, and cryolite. 2. Those which decrease the dilatation, BO_3, SiO_2, Al_2O_3, PbO, SiO_3, ZnO, Fe_2O_3, and the colouring oxides.

L. Grenet.

A NEW GOERZ LENS.

The joint invention of Messrs Goerz and Von Hoegh, the following is their description of a new objective for photographic purposes:—It consists (as shown in the drawing which illustrates an axial section) of



a series of five lenses united together, which must possess certain special qualities in order that the object in view may be attained as fully as

possible. The figures 1, 51; 1, 61; 1, 52; 1, 54; and 1, 61, attached to the figure, denote the indices of refraction of the glass used for the separate lenses in round numbers. In order to obtain the greatest possible strength of light, it is proved to be necessary that at the first refracting concave surface, R_1, as small a refraction (1, 51) as possible should take place, whilst at the last convex surface, R_6, on the other hand, as high (1, 61) a refraction as possible should be present. Furthermore, the first lens must be biconcave, so that at the second refracting surface, R_2, there will be a cementing surface acting as a collector of the light and compensating for the astigmatic aberration; and in order that this surface be as flat as possible, which is desirable to prevent curving of the image, it is necessary that at this second refracting surface as large as possible a difference between the refractive indices of the material of the first and second lens be present, that is, that the second lens be constructed of a glass of high refraction. The second lens must be a biconvex one, and to this must be applied a negative lens of low refractive index, so that at the third refracting surface, R_3, a cementing surface, acting as a light collector, opposed to the second one, may be formed, which, without increasing the astigmatism, exercises a compensating influence upon the distortion which is the product of the other surfaces, so that, by a right choice of the curvature of the surface, R_3, the distortion for a main ray falling sideways will be completely neutralised. For the compensation of the spherical divergence the surface, R_5, is arranged; at this point there must not occur a difference in refractive index much greater than 1, 61; 1, 54; 0, 07, because it must have an exactly fixed depth, which is determined by the direction of the principal rays which must encounter it under as small a refractive angle as possible, because here, otherwise, the distortion influences would be collected which can no longer be compensated by the surface, R_3. From this condition, and from the condition already set forth, namely, that the last lens must be constructed of as highly a refractive material as possible, it becomes necessary to insert between the lens 3 and the lens 5 a further positive lens of medium refraction. This lens 4 can be either biconvex or concavo-convex, according as the surface, R_4, receives a positive or a negative curvature. As at this surface on account of the very slight difference of refractive index (about 0, 02), the errors of distortion and spherical divergence are very little influenced. The lens may be principally devoted to the complete removal of the chromatic divergence. With the increase of the number of lenses in compound cementing systems, increases, of course, the difficulty of bringing the lenses into the combination in exactly central position, and of maintaining the same permanently in this position. In order to meet this difficulty, we have arranged in our five-lens system that the negative lenses possess a greater diameter than the positive lenses enclosed by them, and that the said negative lenses come in contact by means of their projecting exactly centered edges. They consequently enclose completely the positive lenses, which can henceforth only have one position, that is, the exactly correct position in the system.

Our Editorial Table.

The Lumière X-ray Plate.

Fuerst Bros., 17, Philpot-lane, London, E.C.

In sending us a sample of the above-named plate, Messrs. Fuerst Bros. state: "We have made arrangements with Messrs. Lumière to supply a special X-ray gelatino-bromide dry plate, and, in order to give you an opportunity to judge for your own satisfaction, we have much pleasure in sending you a sample box. These new X-ray plates can be manipulated in the same way as ordinary rapid plates, both in the developing and other operations. We may mention, however, that the development and fixing require a longer time than ordinary plates. Development must not be stopped until the image commences to be visible on the back of the negative. The fixing requires generally from ten to fifteen minutes at least, and we specially recommend *abundant* washing, after which the negative must be immersed from fifteen to thirty minutes in alcohol before same is dried. With an exposure of from five to ten seconds we claim that finer results than with any other plates will be obtained, as this X-ray plate is especially prepared by our factory for the work."

News and Notes.

Mr. Archibald Rider, of 83, Mortimer-street, W., announces that he has the sole agency of Dr. J. H. Smith & Co.'s Swiss Transparent Film, for making animated photographs.

A Wrinkle for P.O.P. Workers.—Mr. T. Stokoe, of Clare, Suffolk, writes: "The other day I was toning a batch of P.O.P. prints, when one spot in the centre of a print, about the size of a shilling, obstinately refused to tone. As it was one of a set I wished to dispatch that night, and there was no time to print, this was a trouble. After keeping in bath until the print had got almost too blue, I put my finger to the stopper of the gold solution bottle (1 grain in 1 drachm), and then to the still yellow spot on the paper, and, presto! the thing was done—the print all one colour, and the yellow gone from sky. After fixing, the result was equally satisfactory."

It is stated that the Röntgen rays have been employed in a system of electric printing on tissues. In a process devised by Sokoloff these rays are utilised in combination with a continuous electric current. The band or ribbon to be printed is steeped in aniline chlorhydrate or other appropriate liquid, and one end being introduced into a closed box, lined with black cloth, passes between an endless band of gelatine, mounted on revolving cylinders, and carrying the design to be printed, and a strip of steel connecting two conductors conveying a continuous current of electricity, in such a manner that the design is communicated by the gelatine on the ribbon by the aid of a high tension (11,000) Tesla tube situated between the space bounded by the gelatine band. The design is claimed to be permanently fixed on the ribbon by the magnetic poles of the steel strip.

An Excellent Copying Paper for Enlargements. — The following formula for making paper at home at a nominal cost may be acceptable to those who are enterprising enough to do their own work and not depend for everything on the manufacturer, and complain when they are charged for the labour, which charge is just, as the maker cannot be expected to furnish paper and take blame for failures at a little above cost of chemicals. Make you own paper—it is not very irksome, and need not interfere with your other arduous duties. Take a large plate of glass, make it perfectly clean with talc. Warm the plate before you pour the emulsion, the plate being perfectly level. Take sheets of paper of the best quality, wet them in distilled water, and drain off well, and squeegee down to the emulsion gently, and dry with moderate heat. After the paper is thoroughly hard, cut round the edge and lift carefully from the plate. The emulsion is made as follows: For black tones—Gelatine, 15 grammes; bromide potassium, 9 grammes; water, 150 c. c.; nitric acid, 2 minims. To this 11·2 grammes of silver nitrate, dissolved in 150 c. c. distilled water. The mixture is kept at a temperature of 30° C. for thirty minutes or an hour, according to the degree of sensitiveness required; allow to set; cut up; washed in the usual way; remelted before pouring on the plate. The above plan gives beautiful glossy surface. If a matt surface is desired, the paper should be a trifle larger than the glass plate, clipped at the corners and turned under the edges of the plate and gummed beneath. The emulsion may then be applied directly to the paper by means of a glass rod, and dried as directed. For brown tones—Gelatine, 15 grammes; bromide potassium, 7·5 grammes; iodide potassium 1·6 grammes. Dissolved in 150 c. c. distilled water, to which 2 minims of nitric acid C. P. is added. To this add—Nitrate of silver, 11·2 grammes distilled water, 150 c. c., and proceed as above. These papers are for enlargements or contact printing, but are intended especially for enlargements.—Dr. Hallenbeck, in *The American Journal of Photography*.

The South London Photographic Society's first Continental excursion, which took place to Hamburg, under the leadership of Mr. William F. Slater, has proved a great success. On August 14, a party of eleven left Liverpool-street Station by the Continental train to Harwich; then a pleasant and enjoyable trip on the ss. *Seamew*, where several of the party began photographing, arriving in Hamburg early Monday morning, the weather being dull and rainy. Making for the Hotel Union, the headquarters, to breakfast, the weather clearing up, and the rest of the week was simply grand. After breakfast was spent in prospecting, and after dinner, starting in earnest with the cameras, causing quite a sensation, and small crowds soon collected round the party. Soon, however, one of the party was heard to complain that all the windows were beastly clean, and the subjects being so numerous, it was difficult to decide which to do first. Finishing the afternoon's work, a quiet ride was enjoyed by the steamer on the Alster Lake to Winterhude. As early as six o'clock on Tuesday morning the camera was in evidence round the canals, where there is plenty of work. In the afternoon, starting at 2.30 by steamboat to Neuengamme, a journey which occupies three hours for the small outlay of 7*d.*, through the very pretty and fruitful country of Vierland, and where one gets a good sight of numerous storks' nests on the roofs of houses. Neuengamme Church is quaint; nearly all the doors of the pews are inlaid memorials. There is plenty of work between here and Bergedorf, which journey was walked, and took nearly two hours, as several stoppages were made for taking pictures. The journey from Bergedorf to Hamburg was made by train. Wednesday morning by the 8.45 train to Lübeck, and arriving there at ten o'clock—a splendid centre for the camera, with the picturesque and quaint buildings centuries old. A large amount of work was done here, and the afternoon was spent at Travemünde, where most of the party had a swim in the Baltic. There are several good views of shipping and old buildings worth taking. Leaving here by the six o'clock train direct to Hamburg. Thursday morning Blankenese was visited—a most picturesque little place, and all were of one opinion, that it was the grandest place visited during the week, all wishing they could stay longer. The afternoon, a pleasant ride by steamboat to Winterhude, and there hiring a boat, rowed up the river Alster as far as time would allow, and in the evening attending the meeting of the Hamburg Photographic Society. Friday morning was again spent photographing in Hamburg, and the afternoon by steamboat to Buxtehude, a journey of three and a half hours down the Elbe to Blankenese, and then up the river Este, whose banks are most charming and picturesque—an ideal journey for hand camera work, which can be done from the boat. Having two hours to wait for the train, and it being too dark for photographing, a pleasant time was spent with light refreshments in the first-class waiting-room, and then travelling back to Hamburg fourth class, through one of the party who had by this time picked up a little German purchasing his ticket by mistake, so all followed for the fun of it. Saturday was mostly occupied by buying presents, but several of the party visited the Horticultural Exhibition, where the excursionists had special permission to photograph, through the kindness of Dr. Arning, Vice-President of the Hamburg Photographic Society. Leaving Hamburg in the ss. *Peregrine*, and having, by way of a change, a little rougher sea, arrived in London before eight o'clock on Monday morning

ery one thoroughly enjoying the holiday, and being perfectly satisfied with e whole of the trip. Thanks are specially due to Herr Ernst Juhl, President the Hamburg Photographic Society, for his hearty welcome, advice, and ggestions for some of the daily excursions, which otherwise might have been ssed.

Patent News.

THE following applications for Patents were made between August 16 and ugust 21, 1897:—

ART.—No. 18,925. "An Improved Gas Jet for Magic Lantern and similar Exhibitive purposes." R. J. Moss.

-RAY APPARATUS.—No. 18,931. "Improvements relating to Coin-freed X-rays Apparatus." T. Scott.

OLOURED PHOTOGRAPHS.—No. 18,973. "A Process for Reproducing Photographs in Natural Colours." E. J. Browne and F. J. Abbott, jun.

HOTO-ETCHING.—No. 19,004. "A Method of Making Engraved (Etched) Blocks Direct from the Original Drawing, Diagram, Book, or other Illustrations without the Use of a Negative." Communicated by H. J. Hands. Complete specification. T. W. Sandford-Hands.

EVELOPING APPARATUS.—No. 19,039. "Improvements in Developing Apparatus for Photographs." Complete specification. A. Schwarz.

ANTERNS.—No. 19,158. "Improvements in or relating to Magic Lanterns and the like." S. L. Young.

OLOURED PHOTOGRAPHS.—No. 19,168. "An Improved Method of Obtaining Permanent Coloured Photographs." C. T. Jago.

IXING AND TONING SOLUTIONS.—No. 19,208. "Improvements in Photographic Solutions as used for Toning and Fixing Prints." A. E. Wade.

NIMATED PHOTOGRAPHS.—No. 19,278. "Improvements in the Production and Reproduction of Animated Photographs." Complete specification. W. J. H. Jones.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
4.....	Bolton Mutual Photo. Society .	Excursion: Rivington. Leader, Mr. Marsden.
4.....	Leytonstone	Excursion: River Roding, from Loughton to Abridge. Leader, Mr. Ball.
6.....	Bradford Photo. Society	*Some Photographers I have Known.* Percy Lund.
6.....	North Middlesex	Informal Meeting.
7.....	Aintree	Tennyson's *The Brook.*
7.....	Brixton and Clapham	Members' Open Meeting.
7.....	Gospel Oak	Demonstration with Films. W. J Ramsey.
7.....	Hackney	*Light and Colour.* E. J. Wall.
8.....	Bolton Mutual Photo. Society .	Excursion: Rivington. Leader, Mr. Marsden.
9.....	Bradford Camera Club	Lecturettes by Messrs. Cole, Whetstone, Abbott, Barker, Hurdman, and Anderton.
9.....	London and Provincial	Discussion: *What is the Best Printing Paper as Regards its Power in Printing and After Treatment?*
1.....	Gospel Oak	Excursion: Kichmond.
1.....	South London	Excursion: Cobham, Surrey. Leader, J. T. French.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 26.—Mr. R. Beckett in the chair.

Mr. A. L. Henderson observed in the last number of this Journal a description of an arrangement for vignetting for which a patent had been taken out. He had exhibited one on the same principle many years ago, and although he personally did not claim any originality in the device, he thought attention should be drawn to the fact that it was not new, imitating as it did, in more than one particular, that he had mentioned.

Mr. Philip Everitt, after referring to some controversy in the press as to the excellence and superiority of certain lenses, said it might be of interest to the members to see for themselves some tests he had made. Two lenses of five inches focus, the Stigmatic and the Cooke, were employed, and two comparative exposures from the same point and on the same subject were made. He asked that allowances should be made for the negatives, which were obtained by hand exposures at *f*·6 and much over-exposed. Still, they would allow one to compare the defining properties of the two lenses, both of which were focussed exactly to the centre of the plate, which latter was 7½×5 inches. Taken as they were, the negatives showed to the advantage of the Stigmatic lens.

The Chairman would have preferred to use a flat subject, such as a piece of newspaper, for instance, instead of a row of houses, as in the tests shown. One could not be certain that the houses were at right angles to the axis of the lens, and he thought particular attention should be paid to this point in comparative trials.

Mr. Henderson discovered that the two negatives, when superimposed, did not register all over by something like half an inch, indicating that the lenses differed in focus.

Mr. Everitt replied that so far as the choice of the test subject was concerned, the conditions were the same for the two exposures, and so no question as to equality could be introduced. With reference to the foci of the two lenses, he calculated that one-sixth of an inch was the amount of difference, the Stigmatic being that much the longer.

Mr. Henderson passed round a bottle containing shreds of gelatine in combination with chromate of silver, to show the very interesting effect the silver chromate had on the former. It was a part of about half a pound he had mixed up some years before, and he drew attention to the fact that, though kept in a wet state without any antiseptic or similar preparation, it had not deteriorated in the slightest. The idea which he entertained was to first coat his plates with such a mixture, and then the emulsion over that, in the hope that it would be a prevention of halation. Unfortunately the developer reduced the whole of the first coating and the experiment failed, but he thought the day might come when a developer would be found which would not affect this substance, and then the suggestion would be a good thing.

Some discussion took place on this, and upon the subject of cloud printing.

Hackney Photographic Society.—August 24, Mr. F. W. Gosling presiding.—Reports of the recent club outings were given. Matters relating to the forthcoming annual exhibition were discussed. Mr. A. Barker read an interesting paper on

The Management of the Camera in the Field,

in which he not only gave useful advice as to procedure, but also as to the selection of apparatus.

North Middlesex Photographic Society.—August 23, the President in the chair.—Mr. H. W. Hobden was nominated for membership, and Mr. Lionel Cape was elected. A large number of members and friends turned up to see the travelling exhibition of the affiliation of photographic societies. Tea and coffee were provided, and a very pleasant evening was spent.

August 30, the President in the chair.—Mr. Cox asked how to get a print on P.O.P. off a sheet of plate glass, to which it had stuck on squeegeeing. Mr. Stuart advised soaking in water, which sometimes was effectual. Mr. Barton exhibited a hand camera, which was passed round and examined. In the lantern-slide competition, Mr. H. Stuart secured first place, Mr. Tyler being second. Slides by Messrs. Everest, Mummery, and Taylor, were in addition, added to the Society's collection. In the outing competition to Rochford on Bank Holiday, Mr. Goodwin was first, and Messrs. Mummery and Smith tied for second place.

FORTHCOMING EXHIBITIONS.

1897.	
Sept. 3-Oct. 13	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
„ 27-Nov. 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
October 4.....	Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
December 9-11	Aintree Photographic Society.
1898.	
April.....	International Photographic Exhibition (Crystal Palace). R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the Editors.

Gentlemen,—Will you kindly remind your readers that Wednesday, September 8, is the last day for receiving exhibits in packing cases, but that exhibits sent by hand may be dispatched at any time, provided they reach the offices before nine p.m. on Thursday, September 9? Full particulars can be obtained on application to the Assistant Secretary at the Society's Rooms, 12, Hanover-square, to which address all exhibits should be sent.—I am, yours, &c., H. Wilmer, *Hon. Secretary.*

12, *Hanover-square, London, W., August* 27, 1897.

A DEVELOPMENT EXPERIENCE.

To the Editors.

Gentlemen,—We beg to enclose you herewith letter and photograph received from our customer, Mr. F. Walker, of Castle Douglas. The result, under the circumstances explained, is certainly remarkable, and, thinking it would be of interest to your readers, thought you would like to publish it in your Journal.—We are, yours, &c., Marion & Co.

22 *and* 23, *Soho-square, London, August* 25, 1897.

"Messrs. Marion & Co.

"Gentlemen,—I enclose a photograph taken in June on a Marion' instantaneous plate which, I think, speaks volumes for the quality of your instantaneous plates. The exposure was one-fortieth of a second about 6 p.m.

I had been away amongst the hills with my camera, and the enclosed is a copy of the last 'shot.' I had developed all my plates but this one, and just as I laid it into the developing solution I was called into the shop. I forgot all about the plate, and went back in an hour and a half. Of course, I thought the negative was useless, and without further ado threw it into an old fixing bath; and again I forgot it until the next afternoon (twenty-one hours afterwards), when I had occasion to use the fixing bath, and lifted out the negative, and to my surprise found the nicest quality of negative I think I ever saw. I don't know whether you have had an experience with your plates like the above; but as I have not, nor any photographic friends (both amateur and professional), I thought I would send you a print of it.

"Yours truly, FRED. WALKER.

"*King-street, Castle Douglas, August* 21, 1897."

[The photograph sent with the above is excellent.—EDS.]

THE BLUE PROCESS FOR LANTERN SLIDES.

To the EDITORS.

GENTLEMEN,—In the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY appeared an article about blue-coloured lantern slides and transparencies—so-called new process—invented by Mr. Porter, of Eton College. I read the paragraph with much pleasure, on account of the very careful instructions given to work this new process, but I should like to draw your attention to the following facts, which I am ready to prove. The theory of this process is as old as the days of Sir John Herschel, the well-known English scientist, who discovered the actinity of ferric salts in 1842, and in connexion with potassium ferrocyanide produced the well-known Prussian blue, and invented the now so little-used ferro-prussiate process. I regret to say "so little used," as I am perfectly aware what excellent results this printing method is able to give, especially in connexion with material like gelatine. The prescribed treatment of the sensitive plates, as diluting in hydrochloric acid, ammonia, &c., to intensify or diminish the brilliant blue colour—all those details are well known to intelligent workers of the ferro-prussiate process. The only one difference left between this old and the reported new patented invention is, the material on which the sensitising solution of the ferric salt is coated. We usually sensitised paper, silk, and linen, but Mr. Porter, gelatine-coated glass plates or films. But even this improvement has been made more than six years ago. Two students of the Royal and Imperial High-school for Photography, in Vienna—H. O. Klein and L. F. Steinböck—produced blue-coloured transparencies, and their improvement of the old Herschel process was published, and the *Hamburger Nachrichten*, on April 6, 1891, brought out a very flattering account of it, calling special attention to the use of gelatine in making the sensitive plates. Klein and Steinböck's invention—if we are allowed to call it by this name—respecting the superiority of Sir J. Herschel's discovery, was not patented, but their priority can be easily traced.

As the possibility of an after invention cannot be excluded, I take the opportunity to congratulate Mr. Porter on his success, and repeating the words of the *Hamburger Nachrichten*, that the brilliancy and softness of those blue diapositives cannot possibly be surpassed by any other methods. I give every credit to the rather difficult, but in every way satisfactory improvement of the old process, and should be only too pleased to see this inexpensive, beautiful printing method taken up again by professionals and amateurs, to hold a worthy position in the midst of their sister processes, silver and platinotype.—I am, yours, &c.,

9, *Upper Brighton-terrace, Surbiton.* HENRY O. KLEIN.

"A TELEGRAPH POST."

To the EDITORS.

GENTLEMEN,—Our good friend Cosmos states, on page 550 of the JOURNAL, in a paragraph *re* M. Demachy's criticisms, "I believe that the author is among the number." I am sure you will allow me to state that Cosmos's belief is quite unfounded. I am aware the title of the photograph was altered from *A Telegraph Post*, in the Salon catalogue last year, to *On the Banks*, but it was done without my knowledge, and I felt rather sore about it. Perhaps that was what gave rise to Cosmos's belief.—I am, yours, &c.,

LIONEL C. BENNETT.

11, *Fairlawn-park, Chiswick, W., August* 29, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

A. LÉVY (Paris).—We believe your theory to be the correct one.

PUZZLED.—We do not answer questions when neither name nor address is given.

MRS. S. PERCIVAL.—1. We have no such book. 2. Very small—roughly, from ten to twenty shillings per week.

ENQUIRER.—Difficult to answer offhand. Call in some morning between eleven and one by appointment, and we will endeavour to advise.

LENS.—S. DUSE. The lens is evidently one of the old orthographic type. It is interesting, but has little commercial value; still, it is an excellent lens for many purposes.

C. J. WALTERS.—*Platinotype*, by Pizzighelli and Hubl, obtainable of the Royal Photographic Society, 12, Hanover-square, is the only book likely to meet your requirements.

R. W. FORBES & SON.—We do not know the address. The source of the article was the *Scientific American*, published in your city. The publishers of the paper could probably give you the information.

COLOUR PHOTOGRAPHY (NATURAL?).—W. W. W. We know nothing more of that particular alleged natural-colour process than has been published. You had better wait, as other wise investors are doing, for further developments before parting with any cash.

A. LÉVY.—In the case referred to, it was clearly due to uneven illumination of the original. In your case it was probably due to an inequality in the coating. You, an experienced photographer, would, of course, see that anything you had to reproduce was evenly illuminated.

TESTING SILVER SOLUTIONS.—T. CONNOR. The instrument sold under the name of "Argentometer" is the simplest thing for testing the strength of the sensitising bath. Although, with an old solution, it is not theoretically reliable, it is near enough for all practical purposes in silver printing.

TENANCY.—OXON. So far as we understand your letter, the lease, which was granted to your predecessor, was transferred by the landlord to you when you took over the business, and he has since taken the rent from you. If that is so, you will have to carry out the covenants of the lease. Your predecessor got rid of all responsibility when the lease was assigned to you.

BLINDS.—T. HOLMES. For a studio with the aspect of yours, tolerably dark blue, or a lightish green, will be best for the roof. The same colour may also be used for the side curtains, though, perhaps, owing to the surroundings, if we understand the sketch rightly, a lighter shade will be preferable. For the side of the opaque side of the studio we should recommend a light French grey, as it will reflect a soft light on the sitters.

DARK ROOM.—K. P. C. asks: "Can you tell me the best way to make an ordinary room photographically dark? Can it be done by blinds working in a groove?"—Yes. Any blind-maker will fit such a blind if you provide the fabric, which may be obtained at any photographic warehouse. If the window of the room is small, the best way will be to stretch the fabric on a wooden frame fitting over the sash. Or that may be quite opaque, then you could illuminate the room by an ordinary dark-room lamp.

DAGUERREOTYPE PLATES.—C. MITCHELL. We fancy you will have some difficulty in obtaining Daguerreotype plates now. The process has not been worked commercially for about forty years. The only chance of obtaining any will be from some of the oldest dealers, who may possibly have some left in stock. You might apply to Negretti & Zambra, they, at one time, did largely with Daguerreotype material and apparatus. Not long ago they sent us some fine examples of Daguerreotype pictures. They are the most likely house.

STAINED NEGATIVE.—A. L. As the paper stuck to the negative, which was unvarnished, and the former contained free silver, it is not surprising that it was stained, particularly if the negative was not perfectly washed. Either the negative or the paper was damp. From the description given of the present condition of the negative, we should say it is a hopeless case. The best thing we can suggest is to copy one of the prints made before the negative sustained the damage, and thus obtain a fresh negative, which, if well done, will be a better result than can be obtained by "vamping" the original one under the circumstances.

EXPOSED FILMS.—H. BLISS says: "A customer of mine is visiting Italian Lakes and the Riviera. Can he send his films (Kodak spools) through the post to me, for development, without their being opened by Customs officers? Will you please give me details of notice to be printed on the label, when sending above undeveloped films through the foreign post?"—We anticipate there will be no difficulty in the matter, as the Customs here are the only ones concerned. Better write to the Eastman Company, and ask if any special labels are required under such circumstances. They receive spools daily of pictures exposed in foreign countries.

BROKEN NEGATIVE.—J. B. G. writes: "An accident has broken in two a very fine negative which cannot be renewed. The edges of both glass and film are clean cut, so I am in hopes repair is possible. Can you tell me the best way to proceed? Is it best to leave the edges which have to be rejoined clear, or would it be better to first blacken them?"—As the film is severed, it will be best to mount the broken negative, neatly joined, on another piece of glass, securing it round the edges by strips of gum paper, and then printing by parallel light—say, by exposing the negative at the bottom of a deep box. It will be better to blacken the edges of the glass before joining, so that a fine white line only results, which is easily touched out. If a number of prints are required, the negative may be reproduced.

*** Several answers to correspondents unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

The thirty-seventh issue of The British Journal Photographic Almanac will be published on December 1 next. It is already in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the Almanac. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us list of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the Almanac is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the Almanac are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Glasgow—the "second city" of Great Britain—is at present the scene of an Exhibition alike worthy of photography and of its promoters. The International Photographic Exhibition that is displayed in the beautiful galleries of the Fine Arts Institute is in the qualitative sense perhaps the finest collection of photographs that we have examined, and is most assuredly so in respect of its comprehensive and representative character. A glance at our report, which appears in another part of the Journal, will show that the contributors to the Exhibition are drawn from all sections of photography—the self-styled "pictorial photographer," the professional portraitist, the amateur, the lantern-transparency maker, and the photo-microscopist being, amongst others, prominent; while in the fields of apparatus manufacture and photo-mechanical printing the most enterprising of modern firms are represented. There must be at least 2000 photographs in the Exhibition.

* * *

The Exhibition Executive, which comprises the Council of the Glasgow and West of Scotland Amateur Photographic Associations and representatives of the other local societies, deserves our heartiest congratulations on the results of their labours. Such an Exhibition as this was not organized without unremitting hard work for several weeks beforehand, and for their share of the work the names of Mr. George Chalmers (the President); Mr. W. J. B. Halley (the Hon. Treasurer); and Mr. W. Goodwin (the Hon. Secretary), deserve special prominence. They were ably supported by their fellow committeemen, whose loyalty and *esprit de corps* in all matters pertaining to the advancement of the interests of the Exhibition caused us to regret that southern exhibition executives were not more often animated by the same fine feelings and aims.

During our stay in Glasgow we had occasion publicly to allude to what struck us as the most remarkable feature of the Exhibition—namely, the splendid local support that has been given to it. We have not hitherto been present at a country exhibition at which local photography was so strongly and so effectively represented as at Glasgow. Take away from this Exhibition the photographs and other exhibits that come from outside sources, and there would still remain a large collection of works not unworthy of an entire Pall Mall or Salon display. This will be easily understood when we say that such workers as James Craig Annan, John Stuart, W. M. Warneuke, Charles Sweet, A. Langfier, Professor Finlay, W. J. Croall, J. Morison, W. S. Anderson, R. Ayton, Brinkley and Stevenson, William Crooke, J. W. Eadie, W. Goodwin, J. Lafayette, Fred Mackenzie, A. Lindsay Millar, J. C. Oliver, W. Ralston, Charles Reid, G. Comrie Smith, the late Robert Terras, Cameron Todd, C. M. Wane, R. S. Webster, and others are represented by their very best efforts.

* * *

Special recognition is due to the catalogue of the Exhibition, a volume upon which much care has obviously been expended. It contains some admirable examples of the principal modern photo-mechanical printing processes, and is well worth preservation. The success of the catalogue is due to the labours of Mr. W. J. B. Halley, the Hon. Treasurer of the Association. Mr. George Mason contributes an article to the catalogue on the commercial and professional aspects of photography; photo-mechanical printing is succinctly described by Mr. D. C. Coghill, and the moto-photoscope affords Mr. W. Goodwin an opportunity of briefly descanting upon animated photography. Altogether the catalogue is a creditable and interesting volume which we shall prize as a capital souvenir of an Exhibition that is a great artistic treat, and which we hope will result in an unmistakable financial success.

* * *

Our readers have already been apprised that Glasgow is to be the scene of next year's meeting of the Photographic Convention of the United Kingdom. Thus early the local arrangements for the meeting are under discussion, and there is a strong determination to make it a signal success. The members of the Glasgow Executive have the experience of twelve years to guide them in their deliberations, and we have little doubt, from what we gathered during our stay in the town, that the 1898 Convention will be a great and memorable meeting. It is surely creditable to our Glasgow brethren that ten months beforehand they are considering how best to ensure its success, and we may therefore rest confident that the Convention of 1898 will be in good local hands.

* * *

Messrs. Morgan & Kidd, of Richmond, send us a set of their new specimen show-cards. These they are distributing to photographic dealers, and they ask us to state that they will be pleased to supply them free of cost to any dealer who will make application for same. The cards are in artistic tints of green and cream, and are tastefully blocked with gilt lettering, prints of excellent quality on the firm's papers being mounted upon them. The cards have a most effective appearance when hung up.

* * *

The Forty-second Annual Exhibition of the Royal Photographic Society is now in course of preparation, and will open to the public on Monday, September 27, and the Saturday previous there will be a Private View, followed in the evening by a *Conversazione* at which the President, the Right Hon. the Earl of Crawford, K.T., F.R.S., and Council will receive the Fellows, Members, and their friends. The Judges on this occasion are: In the Art Section—F. P. Cembrano, jun.; B. W. Leader, A.R.A.; Sir J. D. Linton, P.R.I.; G. A. Storey, A.R.A.; W. L. Wyllie, A.R.A.; and in the Technical Section—Captain W. de W. Abney, C.B., D.C.L,, F.R.S.; Chapman Jones, F.I.C., F.C.S.; and Andrew Pringle, F.R.M.S. The Exhibition will be open daily from 10 to 5, and on Monday, Wednesday, and Saturday evenings (when Lantern Slides will be shown) from 7 to 10, and will close on November 13.

* * *

We are informed that the Annual Exhibition held under the auspices of the Photographic Society of India will take place in the months of January and February next, and will be open to the world. Provided the Judges deem the exhibits of sufficient merit, the following medals will be awarded:—A special medal for the best photograph in the Exhibition; the Lady Mackenzie gold challenge medal, tenable for one year, for the best picture by a member of the Society; 4 gold medals (one reserved for a native of India), 12 silver medals, 15 bronze medals, which it is proposed to apportion as follows: For all exhibitors, amateur, and professional, 3 gold medals, 8 silver medals, 10 bronze medals. For amateurs of the Society, 1 gold medal, 4 silver medals, 5 bronze medals. It is proposed, provided they fill, to medal the best in each of the following classes:—Class 1, Landscape; 2, Architecture and Interiors; 3, Portraits and Groups; 4, *Genre* Pictures and Studies; 5, Photographs of Objects in Motion; 6, Lantern Slides and Transparencies; 7, Stereoscopic Prints and Slides; 8, Photo-mechanical Processes; 9, Apparatus and Appliances. *There shall be no appeal from the decision of the Judges.* Exhibits from Europe should be dispatched by the first week in November or not later than November 15, and those from America and Australia a fortnight earlier. All communications relating to the Exhibition should be addressed to the Exhibition Secretary, Photographic Society of India, 57, Park-street, Calcutta.

* * *

Those photographers who joined in the outcry against the restoration of the west front of Peterborough Cathedral may be interested to know that the restoration of the north gable of the west front of Peterborough Cathedral has been completed. Those portions of the great arch, and of the gable above it, which have been taken down and rebuilt, contained in all 2006 facing stones; of these 170 only were found so decayed that they had to be replaced by new ones, and the remaining 1836 have been put back again into their original positions. The result, says the Dean of Peterborough, fully justifies the Committee in the action which they have taken. The central and southern gables, portions of which are in a very dangerous condition, will next be dealt with. Some remarks on this subject appear elsewhere.

THE EYE AND ITS RELATION TO PHOTOGRAPHY.

The gradations between the artistic and scientific aspects of photography are so even, any actual line of demarcation being invisible, that it is difficult to separate them; but it is our present purpose to dwell more particularly on the latter than the former, to treat lines capable almost of mathematical

demonstration. We shall thus avoid controversial matter, as we do not wish to start a polemic. We say "the eye," but that must be held to include the use of one or both organs of sight, most of our readers being in possession of a couple of eyes; we will not say "pair," for eyes that are really pairs are by no means common, irregular astigmatism, unequal foci, or uneven colour perception, being the more usual variation from complete bilateral optical symmetry. Very little consideration devoted to the subject will show that the ordinary single photograph merely suggests an imitation of the roundness and solidity of natural objects, but it is usually only a suggestion for the following reasons. An object produces the effects of roundness and variations of distance either intuitively or by experience, it is not for us to pronounce *ex cathedrâ* which is the correct view, our belief, however, being that it is from experience. In any event objects that we call round or far or near produce certain physical effects, and, if those effects are not produced, the belief in the existence of the roundness of an object is in abeyance. The effects we may consider are two: the altering the focus of the eyes, and the convergence of the optic axes. Moreover, these two phenomena are, to some extent, dependent upon one another. In a flat picture representing near and distant objects, and placed at a foot or two from the eye, the same amount of convergence of the axes is practically required for each part of the picture; also, the focus of the eye is not altered whichever part of the picture is looked at. As a consequence, roundness or solidity is not felt.

If, however, distant objects only are depicted, and the scene is viewed through a hand glass to render the rays parallel, the eyes are exercised upon a picture in precisely similar a manner to that made use of in viewing the actual objects themselves; and it is only personal judgment, founded on general—as opposed to optical—experience that enables the spectator to say that what is before him is a flat picture and not a solid object. If the picture be so painted or drawn or photographed that the colours and details of form are done in a workmanlike way, and with correct delineation, and if, further, it be so placed as to be outside ordinary means of judgement, not only will it appear solid, but the spectator will be unable to say whether it be solid or flat. The most notable, though not the first, instance of this kind ever produced within living memory was the old panorama of London, last seen on the dome of the Colosseum in Regent's Park thirty or forty years ago; a similar one has for a long time been on view at the Crystal Palace. The panorama was painted on the whole inside of the dome, so as to represent the metropolis as seen from St. Paul's, and the spectators were on a platform near the centre of the dome. The picture was so well painted, and was placed at such a distance as practically to need no alteration of adjustment of focus or convergence of axes of the eyes that the illusion was complete, and many spectators actually thought that the great city lay at their feet, while they were elevated above it. Effects almost as illusive may be produced by photography. If a large photograph of a statue, for instance, be placed so far away that the texture of the material it is printed on cannot be seen, and if, between photograph and eye, there be a dark tunnel or such selections and arrangements of objects that comparison is prevented, then also the deviation from parallelism of the axes and the variations of focus of the eyes required are so slight that a very strong illusion may be produced, which may be made complete by devising miniature lights resembling larger ones in their conformation, and placed in such a position as to suggest to the mind that the lights and shadows of the picture are produced by the aid of this light. We are speaking all through of seeing the object with two eyes.

If now we have a photograph in our hands, or on the wall, the adjustment of the eye employed over the surface texture is enough to tell us that we are looking at some material, and not at a number of objects.

Let us, however, next observe our object with a single eye, and the effect of roundness is less difficult to produce in the mind, for here optical experience tends to dominate less, and the judgment of the mind in one aspect alone has effect. The optical experience with one eye possessed by a normal-eyed man is slight, and, as we all know, when one eye is closed for a time, ludicrous mistakes can be made in using the other unscreened one.

So far we have dealt more particularly with what might be termed the physiological aspect of our subject, but it is evident that no picture or representation of natural objects produced by photography or the painter's brush, will truly suggest nature unless it be drawn in accordance with the effects that the objects themselves would produce, and especially so when lines (such as those of buildings, &c) are in question. If, therefore, we can formulate a series of rules to guide the hand in depicting such objects—rules whose correctness is capable of proof—we should have an unerring guide to tell us if a photograph is correct as to its lines and the proportions of the various objects it depicts. Such rules have been made, and in a future article we propose to show their bearing, and the manner in which they conclusively prove what most of us are aware of, though we might find it difficult to say why, that in every way a photograph properly executed is, as regards proportions and directions of its component lines, in every way identical with the representation of the same subject that an artist would produce when working according to the rules of geometrical linear perspective.

Silver Lower Still.—A fortnight ago we mentioned that the record low price of silver had again been broken. Since then that low price has been further reduced, for 23¾*d.* per ounce has several times been quoted on the market. This, of course, is a benefit to plate-makers, but we are told that this advantage is more than counterbalanced by a considerable advance in the price of glass.

Photographic Lectures.—The sixty-ninth meeting of German men of science is to be held at Brunswick on September 20 to 25, and on the Wednesday there will be a joint meeting of the sections to consider the various aspects of scientific photography, some highly interesting papers being promised by many eminent scientific men—Professor H. W. Vogel, René du Bois-Raymond, and others.

Röntgen-rays Apparatus for the Army.—According to the *British Medical Journal*, the Army Medical Department are to be provided with a number of sets of apparatus, which, there is no doubt, would give valuable aid in discovering the exact position of a projectile imbedded in any portion of the trunk or limbs. No fewer than one hundred is the number that the *Journal* states is to be issued.

Lightning-flash Photography.—A recent number of *La Nature* contains one of the most remarkable samples of this class of photographs yet published. There was a display of fireworks in progress at Enghien-les-Bains, and the author of the photograph, M. Deseilligny, planted his camera in a suitable position just before a

thunderstorm passed over. The lens uncapped, he waited till five flashes of lightning had been seen, and then developed his plate. The result was very marvellous; the firework illumination is well photographed, and, above all, a sharply depicted photograph of the flashes, each bifurcated to a considerable extent, the whole making a most remarkable photograph.

Sunspot.—There is, at the present time, a large sunspot visible, which could be readily photographed using the quickest shutter available. It is surprising that so little is done in this direction, for, even without the aid of a tele-photographic lens, an ordinary landscape objective—say, one of the components of a twelve-inch focus symmetrical lens—would enable a negative to be taken which, enlarged only five or six times, would give a view of the sun an inch in diameter. The quick exposure would render entirely unnecessary any adjustment of apparatus on account of the sun's apparent motion.

The Jackson-Harmsworth Expedition.—Mr. F. G. Jackson, the leader of this expedition, who left London in the *Windward* for the North Polar regions in July, 1894, arrived at Gravesend on Friday last. During his three years' absence neither Mr. Jackson nor his *confrères*—Lieutenant Armitage, the astronomer of the expedition, Dr. Koettlitz, Mr. Brice, the zoologist, or Messrs. Wilton and Heywood—had had a day's illness. Brief details of their experiences have already appeared in the daily press, and what they will have to say before the different scientific societies will be looked forward to with interest. Mr. Jackson reports that nothing was seen by his party of M. Andrée or his balloon, though he says he sees nothing to prevent him, with good luck, from accomplishing his project.

Purity of Aluminium Metal.—A paper on this subject was recently read before the Paris Academy of Sciences. M. Ballard pointed out the necessity for having for industrial use the greatest purity in the metal, and he described a rapid mode of analysis. Electrolysis, he explained, allows of it being sold at a price below 2*s.* per pound; but the product contains traces of sulphur, carbon, silicon, and iron. M. Moissan warns us that, for the future of this metal, analytical results must be very exact. The French product now attains a purity of 99·5 per cent., which is at least equal to that of the Pittsburg output. M. Berthelot adds that the French-made metal can not only be drawn into wire, but beaten into sheets one-twentieth of a millimetre thick, these sheets being very useful for casing chemical apparatus with.

Cloud Negatives.—Autumn is now fairly with us, and, as a hint, we would recommend all who have not a good supply of cloud negatives to secure them during the next few weeks, or sooner, according to the subjects they are required for. About the time of the equinox some fine heavy cloud effects and studies are usually obtainable, while, at the present time, when the weather is fine, light cloud effects, of the fleecy kind, are prevalent, better suited for bright and sunny landscapes. By the way, the autumn, when the foliage has assumed its varied tints, is considered by some to be the best season of the year for landscape photography. Most of the late Mr. Vernon Heath's best landscape studies were taken in the autumn, when the sun was low and the leaves had acquired their varied autumnal tints.

Another New Lens.—Of new lenses there seems to be no end, thanks to the Jena glass. There appears to be with all these new lenses a tendency to increase the number of components of which each element is composed. The Petzval portrait, the orthographic lenses of the rapid and doublet types, are all composed of four glasses only. Then came the Zeiss anastigmats with five glasses. Next the Goerz double anastigmat with six glasses. Then followed the convertible anastigmat of Zeiss composed of eight lenses—four in each combination. After that came the American anastigmat with five in each combination. Last week we gave a description of another new lens, recently patented in this country by Goerz and Von Hoegh, which is also composed of ten elements, five in each combination. Who will now bring out a lens composed of a dozen glasses? The greater the number of elements in a combination, the greater, of course, is the difficulty of getting them all properly centered. In the lens described last week the inventors have made a new departure to meet this difficulty. Although the addition of more glasses in the instruments, no doubt, gives us greater perfection, it will not, obviously, tend to give us cheaper photographic lenses.

Hans Holbein.—The four-hundredth anniversary of the birth of Holbein is to be commemorated by an exhibition of his works which is now being organized in the rooms of the museum at Basle. It is in that city that the famous artist spent a great part of his early life, and the public galleries there contain some of his best paintings and a collection of his best drawings. But these are to be supplemented by original works from the galleries of Berlin, Zürich, and from a number of private collections, and also by the loan of a large number of reproductions from his best works. These are united in a way so that it will give a comprehensive idea of Holbein's great activity while he lived. This Exhibition is to be open all the winter, commencing at the beginning of October.

England is not short of Holbein's works either in our national or in private collections. Her Majesty possesses a fine collection of Holbein's drawings in her private collection at Windsor. The existence of these pictures was not known of till a few years ago, when, we understand, they were discovered stored away more as lumber than anything else, forgotten for many years, in St. James's Palace. These drawings, or a large proportion of them, have been reproduced by Mr. Fred Hollyer and others, and also by the house of Franz Hanfstaengl, of Munich, who have issued a handsome bound volume of the best and most interesting of them with accompanying letterpress.

Soldering Aluminium.—This operation, which forms the one great drawback to the popularisation of aluminium apparatus, naturally attracts the attention of many experimentalists. Recently Mr. A. T. Stanton, writing to *Nature*, describes a discovery he has made which seems on the surface to offer more probabilities of a successful solution of the problem than any yet published. It consists in the utilisation of our old photographic friend, iodide of cadmium. Mr. Stanton points out the difficulty of using silver chloride, a well-known aluminium method. If this iodide be fused on an aluminium plate, a violent evolution of iodine vapour results, with an alloying of the metallic cadmium with the aluminium, and the production of a white residue, which interfuses with the easy production of a joint. But the addition of zinc chloride prevents this objectionable feature occurring, and the final process is thus described: "I mix concentrated zinc chloride solution with a little ammonium chloride, evaporate in a round porcelain dish, and ignite at a red heat till a part of the ammonium chloride is volatilised. The fused chlorides are now mixed with cadmium iodide. The proportions are best adjusted experimentally. The final result, when the salts are completely fused together, is a flux which readily enables tin (or other soldering alloy) to unite perfectly with aluminium. The melted flux can be taken up in a pipette with an indiarubber teat, and dropped on the surface of the metal to be soldered. Some powdered metallic tin is also sprinkled on the surface. The aluminium is then heated over a Bunsen flame till the flux just melts; it can then be quickly placed where it is wanted with a piece of copper wire or thin glass rod."

Cathedral Restoration.—It will be remembered what an outcry there was some time back, amongst antiquarians and archæologists, about the pulling down and rebuilding of the west front of Peterborough Cathedral and the acrimonious discussion that was

carried on in the daily press between them and the Dean and Chapter of the Cathedral. However, the latter body, acting on the advice of their architect, decided to do what he thought was actually necessary, and a letter to the daily press last week, from the Dean, announces that the work is now complete and the scaffolding removed. The public now have the opportunity of judging how far the prognostications of the former were justified or not. One thing seems certain, that what has been done was absolutely necessary for the safety and stability of the structure, and that end could not be so well attained by the patching up proposed by the antiquaries. As we said at the time, photographs taken before the restoration will show how far the original work has been departed from. Chichester Cathedral, or some parts of it, are now in need of repair and restoration, and a committee has been appointed for the purpose. It is proposed, on the advice of the same architect, Mr. J. L. Pearson, R.A., who advised the Dean and Chapter of Peterborough, and carried out the work, in the first place, to rebuild the north-west tower, which has been pronounced necessary for the safety and preservation of the fabric originally supported by the tower before it fell. The architect has prepared plans, and a builder has estimated for the work, and it is proposed to get on with it so far as the present subscriptions will permit of. The committee hope, as funds are supplied, to repair the south transept and restore other parts. Already there are protests against the proposition of rebuilding and patching up suggested; but whatever is done must be done substantially, so as to hand down the Cathedral to future generations as a building, and not a pile of ruins. Some archæologists see more beauty in a mass of ruins than in a perfect structure—the majority of people do not.

Apropos of the above, there is to be in the Ecclesiastical Exhibition in connexion with the Church Congress, a loan collection, embracing works in precious and other metals, tapestry, embroidery, carvings, drawings, paintings, old Church furniture, &c. It will be interesting if in this Exhibition there are shown photographs of the west front of Peterborough Cathedral before and after its restoration. Then the public will have the opportunity of judging for themselves how the Dean and Chapter's architect has carried out his work, and what value should be put upon archæologists' and antiquaries' protests in the future.

MULTIPLE STOPS IN HALF-TONE PROCESS WORK.

I.

It would be a very difficult, or, perhaps, an impossible task at the present day to suggest any new form of stop for half-tone process work that is likely to present advantages over those in ordinary use, and such is not my intention in the present article. But I wish to direct attention in a suggestive manner to a principle which seems to deserve a little more consideration than has hitherto been vouchsafed it. I allude to stops with double or multiple apertures.

The first mention, to my knowledge, of the principle, was in a paper by Mr. Deville, Surveyor-General for Canada, reprinted in the English journals about eighteen months ago, and it has since been further developed by Count Turati. The former, I think, only mentioned it as a means by which the exposure could be shortened, while the latter applies it for the purpose of facilitating the joining up of the high-light dots, and at the same time securing gradation. My own experiments have been made with the particular object in view of shortening the exposure required with collodion emulsion, but other features have developed themselves which seem to specially recommend the principle for dry plates in general.

It is pretty generally recognised, I think, that dry plates require somewhat different treatment when employed with the screen to that ordinarily given to wet collodion both in the matter of size of stop and screen distance. Their different behaviour under development and the formation of the image in, instead of on, the surface of the film not only tend in the direction of filling up the clear spaces, but render it extremely difficult to remedy the fault by "clearing," as is easily done when wet collodion is used. There is thus with dry plates less difficulty in joining up the high-light dots, though this advantage is somewhat discounted by a tendency to the formation of too large shadow dots, and these circumstances combine to render the use of a smaller stop desirable. In the case of gelatine dry plates this is not a matter of great moment, as their sensitiveness easily admits of it, but with collodion emulsion it is fatal, owing to the excessively long exposures required.

The peculiarity of the latter process is that, while sufficiently sensitive to the high lights, it fails entirely except with disproportionately long exposures to do justice to the shadows of a picture. It is not that the shadow dots are not formed, but that they increase in size instead of in density with the exposure, and it is not at all unusual to obtain a "chessboard" pattern all over the deepest shadows when the high lights are barely joined up, the only difference being in density. The only way in which this can be remedied is by using a smaller stop for both high-light and shadow dots; but, though this may be practicable when a very good light is available, it is quite out of the question in the majority of cases in daily practice.

It is here that the principle of multiple apertures becomes valuable. This consists in using a stop having, instead of a single small opening, two or more of the same size and shape suitably placed, the primary result being, of course, to admit a proportionately larger volume of light. It might be supposed that this would be tantamount to employing a single aperture of the same total area; but, if the multiple apertures are properly placed, such is not the case, the stop works precisely in the same manner as regards shape and size of dot as the single opening if used at the same screen distance, but the rapidity is increased as many times as there are openings.

Let us suppose a group of nine squares to be taken from a chessboard, the centre and four corner squares being the black ones. If the white squares be taken as four square openings, this will represent the form of quadruple diagram figured by Mr. Deville in his paper, and it is to be used with the diagonals of the squares running in the direction of the lines of the screen. But, although this form of stop is quite correct and accurate in working, I do not think it makes the best use of the principle; since, if we make the *black* squares the opening, we have an equally correct form of stop that works one-fourth more rapidly than Mr. Deville's, as we are using five instead of four-ninths of the total area of larger square. This is the form of stop I have chiefly used in my experiments, as I have found it most generally useful as well as practicable; but any number of openings may be used, so far at least as the lens aperture will permit, provided they are placed so that their centres coincide with the centres of a series of chessboard squares. I have compared the results of such a five-aperture stop and a single aperture of the same size with the same screen distance in each case, and with exposures relatively as five to one, and I could detect absolutely no difference in the character of the dot in any part of the picture. The only difference between the two negatives was that the shorter-exposed one was clearer and more vigorous, owing, no doubt, to the proportionately stronger illumination.

In using the multiple stop, the first point that will strike the observer is, that there are two screen distances at which it can be effectively used; that is to say, if the dimensions of the stop are within reasonable limits, and the screen holder allows sufficient motion. If these distances be noted for any particular stop, they will be found, on referring to Mr. Branfill's tables of screen distances in *Penrose's Annual* for 1896, to correspond respectively with the figures relating to the total area of the square in which the apertures are inscribed, and of the individual openings. Thus, there is one position in which the screen and plate are close together, and another in which they are widely separated. To give an instance, a five-aperture diaphragm, in which each opening is a quarter of an inch square when used with a camera extension of twenty-two inches, is in position when the screen is brought close up to the plate, and again at a trifle over a quarter of an inch distance; and, on reference to the Penrose tables, the screen distance for three-quarters of an inch (the total area of square covered by the apertures) is one thirty-second of an inch, and for the individual openings exactly a quarter

of an inch for a 133-line screen. But another stop used with the same lens, having thirteen quarter-inch apertures, extending over an area an inch and a quarter square (twenty-five squares of the chessboard) has only one screen distance, as the total area is far too large to be available at anything like the camera extension used. Similarly with very small apertures, it is possible there may be no "screen distance" at all, the total area on the one hand, and the individual apertures on the other, being both beyond the limits of the screen movement.

I have said that there is no difference between the dot produced by the single and multiple-aperture diaphragm employed at the same screen distance; but, if the two images produced by the latter at the different positions be compared, they will exhibit a remarkable variation. That produced at the closer distance will show a series of dots distinctly taking the form of a cross, and the slightest variation from the correct position will produce a pattern exactly resembling that resulting from the crossing of the screens in three-colour work. In the other position, the ordinary form of round dot, closing up to chessboard pattern, is produced. In the first case, we have either one simple image of the stop, or else five exactly superposed and showing distinctly the form of the stop; the likeness is still further strengthened if a four-aperture diaphragm, in which the centre square is opaque, be used, for then each cross will show a minute transparent point in its centre. In the second position, the five images have so far altered their positions as to overlap the corner squares of four of them, falling upon and coinciding with the centre square of the fifth, the general form of the cross being lost. Here each dot is the combined work of five adjacent screen openings; and it would seem, from theoretical considerations, that there should be a third position of the screen, in which the corners only of the adjacent images overlapped.

In speaking of the correct screen distance, I am referring to the positions in which the ordinary or practically useful dot is formed. Between the two positions referred to a variety of patterns arising from the overlapping of the images are to be traced, but these are of no value. Mr. Deville speaks of double diaphragms producing closer rulings, which indeed they do, in certain positions of the screen, but it is only with an original of rather coarse ruling that this application seems likely to be of any use. Another remark of the same writer with regard to the necessity for far greater perfection in screens and correctness in adjustment of the distance when using multiple apertures is worthy of a word of passing notice. It seems to me that this refers rather to a former period when screens, probably collodion copies of more or less imperfect originals, were very different from those in present use and when the separation between screen and plate was secured by blocking up with strips of silver or of glass as alluded to in another portion of the article. At any rate with a Levy screen no such trouble exists, and if the apertures are only fairly correctly placed, a perfectly even result is obtained, while the adjustable screen holder enables the distance to be measured with the greatest accuracy, and removes all uncertainty on that score.

In applying this principle to practical use it must not be imagined that any two stops for the joining up and shadow dots respectively will answer the purpose. Just as the correct placing of the individual apertures is necessary to their accurate co-operation, so the due relation of the different stops to one another is an equally important element of success. In the first place the two stops used must be capable of working at the same screen distance—this is a *sine-quâ-non*, for I doubt whether the most accurate machinery would render it possible to change the screen distance during exposure without disturbing the position of the dots; and, unless the two series of dots coincided, the result would be useless.

In this connexion the apparent anomaly of two different-sized stops working at the same screen distance may be mentioned, but it must be remembered that they are being employed for different purposes. If the shadow stop, which works at the same screen distance as another one used for joining up the high lights, were required to do the same kind of work as the other, its position would be much further away from the plate. But as a matter of fact for its actual use, instead of trying to spread the area of illumination as much as possible, the aim is to concentrate it into the brightest and smallest points; and to the fact that this object requires a relatively different screen distance is mainly due the possibility of using multiple stops in combination. W. B. Bolton.

SENSITISED FABRICS.

For the last two or three years now we have had exhibited in the Salon photographs on material which have, for certain effects at least, the advantage over rough papers. To those who consider that "Realism in art is the ideal with a smudge," there can be no better medium than fabric, because it can be obtained of a far rougher surface than any paper; and, further, it is extremely easy to stain the fabric or even use coloured ones, and thus obtain any desired effect in this way.

There are, however, many who, whilst not believing quite the above dictum, yet desire to obtain something novel and striking in their pictures; and others, again, who may desire to use fabrics for printing on for decorative purposes, decorative either of their homes or personal dress. To such, sensitised fabrics present a new and almost untrodden field for experiment, for silk, satin, velvet, or linen may be sensitised and printed on without much trouble. It need hardly be pointed out that for small work, as a rule, the finer-grained fabrics are desirable, whilst for larger pictures the grain may be as coarse as fancy dictates.

Whatever material be chosen it is advisable that it should be new, and, further, should be freed from the dressing with which too often such things are weighted. After the washing it is advisable to allow the material to nearly dry, and then iron it with a fairly hot iron, so as to take out the creases as far as possible. When this has been done the fabric is ready for sizing, which, although not absolutely necessary, is preferable, as it tends to keep the image more on the surface, no matter what may be the after-sensitising. This sizing is effected by making a one per cent. solution of hard gelatine, and drawing the material through this solution, which, for convenience, may be placed in a porcelain dish. The fabric should then be hung up to drain and dry, and in this condition will keep for any length of time.

The printing process may be either with iron, silver, or platinum; and either printing-out or development in the case of the two latter metals. The iron printing process, which it is advisable to adopt, is that of the ordinary ferro-prussiate, which can be made as follows:—

1.

Ammonio-citrate of iron	130 grains.
Distilled water	1 ounce.

2.

Potassium ferridcyanide	110 grains.
Distilled water	1 ounce.

The ammonio-citrate should be in clear red brown scales without any brown powder, and the red prussiate must also be quite free from any adherent powder, and it is advisable to just rinse the crystals with water before dissolving. When the salts are dissolved the two solutions should be mixed and filtered and kept in the dark. Whilst these solutions will keep, it is advisable not to mix up more than is required, or otherwise they are liable to give impure whites. To sensitise the fabric it should be placed on a sheet of glass, and the solution brushed over it by a camel's-hair brush (about No. 19 being a convenient size). The solution should be placed in a measure or saucer handy, and as even a coating as possible given, if necessary passing the brush first in one direction and then in the other. The sensitised material should be dried as quickly as possible, in about four hours at the most; and whilst there will be no difficulty about this in summer, it may be necessary in winter to use a drying-box, or else to allow it to partially dry, and then iron with a warm iron between pure blotting-paper. Little need be said about the printing or development, the former being done as usual, and the latter, as is well known, by immersion in water. There is one point, however, which it is as well to remember, and that is that with very hard water it is advisable to use, first of all at any rate, water acidulated with hydrochloric acid to prevent the precipitation of basic iron salts in the fibres.

Silver-printing processes may be divided into the printing-out and development methods, and of these there is no doubt that the former is to be preferred. For printing out, the simplest plan is to immerse the fabric in a three per cent. solution of common salt or ammonium chloride for five minutes, then to blot off between blotting-paper, and then sensitise in a five per cent. solution of silver nitrate, and dry and print as usual. The disadvantage of this method is that the image is entirely in

the fibre itself of the material, and therefore the resulting prints are somewhat flat and poor. A better method is to soak forty grains of hard gelatine in one ounce of water for half an hour, dissolve by the aid of heat, and add fifteen grains of ammonium chloride, and having fastened the fabric by drawing-pins to a flat board, or else lay it on a sheet of plate glass previously talced, and then coat with the salted gelatine by means of camel's-hair brushes, then allow to dry, and then sensitise with a thirty grain solution of silver nitrate.

Coblenz has suggested recently the by no means new method of using a one per cent. solution of Iceland moss instead of the gelatine; but, so far as our experiments have gone, this presents absolutely no improvement on ordinary gelatine.

There is one little difficulty in using printing-out processes which will very soon be met with in practice, and that is the stretching of the fabric during the examination of the progress of printing. To avoid this, it is as well to temporarily affix the material to a stout cord by indiarubber solution round the edges.

As regards the toning and fixing operations little need be said, except that it is as well to plunge the fabric before toning into salt and water which converting the free nitrate into chloride, prevents the staining of the fibre to a great extent. This is followed by subsequent washing and toning in any ordinary gold bath such as is used for albumenised paper, only half the strength, will give good results. If a uranium and gold bath be used, and the fabric be deeply printed, rich warm black tones may be obtained, though these may be more easily obtained by using platinum, followed by gold, as has been lately recommended in our columns. The fixing bath should be half the normal strength, or otherwise the print loses too much.

Coating fabric with a gelatino-bromide emulsion is not quite such an easy matter; but, it will be found, that if any ordinary bromide emulsion, such as is used for bromide paper, be employed with half the normal quantity of gelatine, it will adhere sufficiently well to the fibre to give good results. A better plan would possibly be to salt the fabric heavily with a fairly strong bromised gelatine solution and then brush over with a solution of silver nitrate, and when nearly dry again brush over with a solution of bromide so as to ensure the absence of free nitrate. This would cause the bromide of silver to be more in the fibre, though it would be, of course, very slow.

The sensitising of fabrics with platinum and for other printing processes we must leave for a further note.

LAW AND PHOTOGRAPHY.

Law, lawyers, and all pertaining thereto are proverbially slow and conservative. A long time must elapse before a new invention, a fresh process, or a scientific discovery, is officially recognised or even mentioned in an Act of Parliament. Photography, with its innumerable applications in art, science, and commerce, had become, for some fifty years or more, a matter of everyday knowledge before it found serious record in the Statute Book. This result, desirable or not as it may seem to individuals, was probably due in part to foreign amateur photographers, who love to play around our forts and camps. The Official Secrets Act became law on August 26, 1889, and there, snugly and inoffensively buried in the interpretation clause at the end, it is laid down that the expression "sketch" includes any photograph or other mode of representation of any place or thing. One would have thought that photographing, with its exact method of portraying, was a far more serious matter than making a sketch, and that therefore, in the body of the Act, the word photograph would have been used. By that Act—which seems singularly to be overlooked when French and German officers are allowed free access to our forts and arsenals—it is laid down that where a person, for the purpose of wrongfully obtaining information, takes, or attempts to take, any "sketch" (which therefore includes a photograph) of any fortress, arsenal, factory, dockyard, or camp, he becomes liable to fine or imprisonment (with or without hard labour), or both.

That Act, which probably is about the first to officially recognise photography in so many words, was quickly followed by the Interpretation Act, 1889—the same year. There the legal draughtsman, having once admitted the word within the sacred precincts of the law, takes care to retain it. In that, and in every other act, whether passed before or after, expressions referring to "writing" shall, unless the contrary intention appears, be construed as including references to "photography." Thus, by law, writing and photography come to mean the same thing, which, to the non-legal mind, is distinct news. The awful effect of this equation becomes apparent when we look at the Indecent Advertisement Act, passed on July 26, 1889—also the same year. Any person who, after the coming into operation of that Act, affixes to, or inscribes on, any "house, building, wall, hoarding, gate, fence, pillar, post, board, tree, or any other thing whatsoever," or who gives or delivers to any other person any "picture, or printed or written matter which is of an indecent or obscene nature," renders himself liable to fine or imprisonment, or both. The Act is silent as to whether, in the generic term "picture," photograph is included, but inasmuch as it becomes a crime to affix or give any indecent or obscene "written matter," the naughty-minded photographer, by the Interpretation Act referred to before, would be nicely caught. The wording in the summons would run funnily. There being no reported case on the point, we may give a supposed example. "Whereas on the —— day of ——, 18——, John Jones did, &c., affix to a tree certain printed matter, namely, a photograph," &c. It sounds odd; legal jargon often does, but it is none the less correct for all that.

This legal liking for photography, which apparently became prominent about 1889, has continued. In the Penal Servitude Act, 1891, we find the Secretary of State may make regulations as to the photographing of all prisoners who may, for the time being, be confined in any prison; and this Act modifies the regulations respecting the manner and dress in which the prisoners are to be photographed, as laid down in the Act for the Prevention of Crimes, 1871.

But, though many years elapsed before photography became general in the Statute Book, its help in case law has long been recognised, and now photographs in court are as common as blackberries in autumn. It would be interesting to know when the first photograph was tendered as evidence in a court of justice, and still more interesting to know when such evidence was first accepted. It cannot be very long ago, for, even at the present day, some of our Judges view photographs with grave suspicion, treating them as some people are inclined to do figures, that is, as able to prove anything. In the reported cases of case law we are, however, continually coming across references to the value of photographs. For example, Lord Fitzgerald, in a House of Lords case, in 1883 (Great Eastern Railway Company *v.* Hackney District Board of Works), said that "the facts have been already stated, and they are made clear by the photographic views attached to and forming part of the case"—a valuable testimonial from the highest tribunal in the land to the use of photographs in court.

With the recent very successful efforts in photographing objects in motion, and then reproducing the same on the screen, it may not be long before we find events actually shown to the jury as they took place. Counsel's eloquence then would pale before such ruthless fact-showing. In any case the use of photography in trials and cases is obviously yet in its infancy.

HISTORICAL PHOTOGRAPHS IN THE PHOTOGRAPHIC SECTION OF THE IMPERIAL VICTORIAN EXHIBITION AT THE CRYSTAL PALACE.

IV.

Not the least interesting objects in the Exhibition, as illustrating inventions and reintroductions, are those in connexion with the carbon process. Mr. Walter Pouncy has lent (Nos. 79–80) examples of the late Mr. John Pouncy's carbon work produced in 1858, without transfer. Mr. Pouncy's process is the bichromated-gum process, of which examples have been shown in some of the exhibitions, notably the Salon, during the last two or three years, and to which, recently, a new, not to say very misleading, name has been given.

The inventor's method of working was this: Paper was prepared by brushing it over with a mixture of a solution of gum arabic, bichromate of potash, vegetable carbon, or other pigment in a very fine state of division. His method of getting an even coating is described on page 245 of our last volume. The image, after exposure, was developed by simply washing with water, which removed the unaltered coating; sometimes the developing water was used slightly warm. These examples, produced nearly forty years ago, serve admirably to compare with those of the last year or two by the same process, though it has now been given a new and inappropriate name.

Mr. W. Pouncy has also lent some other examples of his late father's carbon prints, without transfer, of more recent date, 1863–8, by another process—the "ink process." This process was invented by him in 1863. In it bitumen is incorporated with or without bichromate of potash, with fatty matter—thin printing ink, in fact. After printing, the image is developed with turpentine. Most of the specimens are on paper, but there is also a large and very fine one about 30 × 20 on a wood panel (No. 197) and French polished, fitted up as dado and frieze for a room,

or the panel might be used for ship's decoration. This example shows how well suited this process is for decorative purposes generally. This process is also specially adapted for the production of pictures on canvas as a basis for oil colouring, as the "ground" of the canvas and the photograph are of the same, or similar, materials to the oil colours used by the artist, so that there is no risk of the picture peeling or splitting off the canvas. Mr. J. A. Sinclair has lent an early (about 1863) print (No. 98) of large size by the carbon process without transfer — the *Waterloo Banquet*, apparently by Pouncy's first method.

Mr. J. Wilson Swan, the inventor of the carbon process as now usually worked, has lent the model of the original machine he used for coating his tissue. In this early form of machine a strip of paper is passed over the top roller and under the bottom one, the ends are then cemented together, forming a band—hence the term, "band of tissue," which is then stretched tight. Under the bottom roller is a vessel containing the pigmented gelatine, over the surface of which, when the machine is worked, the paper passes and licks up a coating. Mr. Swan has also lent a couple of specimens (Nos. 96–7) of his early work by the indiarubber method, date about 1866, which have a depth and richness that is certainly not surpassed by any modern carbon work. They are both reproductions from paintings. The latter one is of large size, and, by reason of its rich, deep, black colour, and the mount being plate-marked, many have mistaken the picture for a mezzotint engraving.

Mr. Foxlee has also lent an early example of carbon printing, *Waiting for the Boat*, negative from life, by Mr. H. P. Robinson. This is interesting, as it was the presentation print of the original North London Photographic Society for 1866. This Society was eminently a technical one, and it evidently selected this work for its technical qualities rather than its artistic merits. It is an excellent photograph, however, of a browner tint than those just alluded to, and serves admirably to illustrate the excellence of double transfer by the indiarubber method of working. It is very noticeable how perfectly the gradations in the delicate tints are preserved. This is very marked in the four hands of the models, which are rather conspicuous objects in the picture; indeed, it would be difficult to retain them so perfectly by any other method. The print was made by Mawson & Swan when they were working the process at Newcastle-on-Tyne.

It will be well just to describe the indiarubber method of working the double-transfer carbon process. It is this: The temporary support upon which the print is developed is fine paper coated with a thin solution of indiarubber in benzole and dried. As the method was first worked, the tissue, after exposure, was also coated with the rubber solution and dried. Then the two rubbered surfaces were pressed in contact between the rolls of a powerful press. Perfect adherence was thus secured. The print was then developed and dried, and the transfer paper applied. When that was dry, the back of the temporary support was treated with benzole, and the print stripped off. Later on, it was found that the coating of the tissue with the rubber could be dispensed with, for if it and the support were brought into contact under water, and then squeegeed together, as is now done with any other support, perfect adherence was obtained. This was a great simplification in the working of the process. The indiarubber system is rarely, if at all, followed now in this country, though it is still used almost exclusively on the Continent. It is a noteworthy circumstance that the two large Continental firms that send so many carbon reproductions of the works in our national collections to this country work entirely by this method, notwithstanding that it very materially increases the cost of production—nearly double, we were told—the reason assigned being that they cannot obtain such fine results by any other system of working.

Mrs. Smith has lent (Nos. 99–100) examples of modifications in working the carbon process, by the late Mr. Geo. Smith, mostly by colouring the pictures on the back while on the temporary support. One is a copy of an oil painting, and, after colouring, the carbon picture was transferred on to canvas, and is very effective. One is a landscape in which the high lights have been picked out while on its temporary support, and then transferred to a blue-grey final one. In another, a portrait, the high lights have been picked, lightly tinted with colour, and transferred to a pale-blue final support. Mr. Smith also used the rubber method. These pictures, produced in the early seventies, are suggestive of other modifications in carbon printing.

Frames (Nos. 81–85) of prints demonstrating the so-called continuating action of light in carbon printing are instructive. These prints were used by Mr. Foxlee in illustrating a paper read by him before the original South London Photographic Society early in 1879, in which it was shown that the continuing action was dependent upon moisture in the tissue, and that it was accelerated by heat; also that, if the tissue were made thoroughly dry, the action was arrested, and that the prints could be kept for many months between exposure and development without their getting any darker.

Mr. J. A. Sinclair has lent examples (Nos. 88–9) by the Artigue process of carbon printing without transfer that are remarkably good. This process, however, must not be confounded with the bichromated gum one whether under its old or new title, because it is quite different. Whatever may be said on theoretical grounds against the Artigue process, it is very clear, as the examples prove, that in the hands of Mr. Sinclair it is capable of yielding most excellent results. The Artigue may be considered the latest phase of the carbon process.

One of the most important applications of the carbon process at the present time is for enlargements. For this purpose the single-transfer method is usually adopted. This was introduced by Ernest Edwards in 1868. There are some very fine examples in the Exhibition of recent date. One by the Woodbury Company (Eyre & Spottiswoode) of the Vandyke Room, Windsor Castle, is very fine; so are some by Messrs. Thos. Illingworth & Co.—*The Waning Moon* and *Still is the Night*—the colours being specially suited to the subjects. Mr. Thos. Fall has lent some enlargements of his pet subjects—animals, and one of H.R.H. the Princess of Wales and dogs, from a negative taken, we believe, over a quarter of a century ago. Messrs. Bulbeck & Co., some fine interiors and Mr. F. H. Worsley-Benison, some excellent enlargements—seascapes. These are all capital examples of the carbon process as applied to enlargements, and are executed by the single-transfer method of working. The main advantage of the carbon process, whichever system be employed, is the permanence of the results.

A screen at the end of the court is devoted entirely to another process as permanent as carbon—the platinotype. This process was invented by Mr. W. Willis in 1873. When first introduced, it did not meet with very much favour, as glossy prints were then the order of the day. Things have since changed, and now the platinotype is one of the most important of all the printing processes. It is represented by two loaners, the Platinotype Company (the inventors), and Mr. Fred Hollyer, one of its earliest workers, and it could not be better illustrated than by these two exhibitors. The former have lent fine examples (Nos. 118–23) of reproductions from paintings, figure studies, landscapes from nature, &c. These pictures have a delicacy, and, at the same time, a richness and vigour that can rarely be equalled by any other process. Mr. Hollyer's exhibits are of large size, and are all reproductions of paintings—Burne Jones's *Days of Creation*, *Aurora*, and G. F. Watts's, R.A., *Sir Galahad*. This gentleman's series serve a double purpose; it illustrates the suitability of the platinum process for art work, and also exemplifies what can be done in England in the way of art reproduction. We hear a deal at times about artists sending their work to the Continent to be reproduced because, it is alleged, they cannot get them satisfactorily done here. Mr. Hollyer's fine work clearly shows, at his hands at least, this is illusary.

While on the subject of art reproduction, we call attention to a very instructive as well as interesting—historically—collection, lent by Messrs. Henry Dixon & Son (Nos. 66–70), which is given in the catalogue as "Comparative photographs from oil paintings," &c. The "comparative" is between ordinary and orthochromatic plates—Dixon & Grey's process—with and without the use of colour screens. Messrs. Dixon & Grey were the first in England to practically illustrate the value of orthochromatic photography in the reproduction of paintings. This they did by showing at the 1886 Exhibition of the Photographic Society of Great Britain the same examples as are shown here, and for which they were awarded the Society's medal. Till then, orthochromatic photography had received but little attention in this country, but afterwards it did, thanks to these gentlemen.

Close in appearance to platinotypes are some fine examples of what may be termed the latest printing process—platino-bromide paper, as well as gelatino-chloride papers, lent by Messrs. Wellington & Ward, with whom these papers are a speciality. The Eastman Company have also lent some excellent examples on similar paper. The application of bromide paper for direct enlargements is well represented by the firm that first introduced commercially this paper, Messrs. Morgan & Kidd, by a magnificent enlarged portrait, *Mrs. Langtry*, about six feet by four feet, or larger. It is noteworthy that the invention of all the various emulsion processes of photography, whether collodion or gelatine, either as applied to glass or paper, is due to this country.

What may be termed up-to-date applications of photography are represented by astronomical and meteorological photography. Some fine stellar ones are lent by Sir Howard Grubb, F.R.S., Mr. W. E. Wilson, F.R.S. (taken with instruments made by Sir Howard), and the Astro-

nomer Royal, Cape Town, illustrating the star survey. *Knowledge* has also lent a representative series of photographs (mechanical prints) of the moon at different ages. There is also a large photograph of the moon, taken by Mr. J. A. Forrest and Mr. J. Hartnup at the Liverpool Observatory in 1854.

In connexion with photography, as applied to meteorology, the Kew Observatory Committee of the Royal Society have lent a very interesting collection, showing the photographic charts of the self-recording instruments in use there—magnetrogram, electrogram, thermogram, barogram, cloud photographs, sun spots, &c. Not the least interesting part of this exhibit is magnetograph and barograph records made on Daguerreotype plates so long ago as 1849. The Royal Meteorological Society have also lent some capital examples of photographs of lightning.

THE GLASGOW EXHIBITION.

On Wednesday evening, September 1, the Lord Provost of Glasgow opened the International Photographic Exhibition, which has been organized by the Glasgow and West of Scotland Amateur Photographic Association. The Galleries of the Institute of Fine Arts, where the exhibition is to remain on view until October 13, were utilised for the purposes of a *Conversazione*, which was attended by several hundreds of visitors. A few short speeches were made, Mr. Valentine Blanchard (one of the Judges) and Mr. Bedding (Editor of The British Journal of Photography) congratulating the executive on the fine quality of the Exhibition. Instrumental music and a display of animated photographs were provided for the amusement of the company throughout the evening.

The galleries of the Institute number five, the largest of them affording hanging space for about 500 photographs, many of them being enlargements of considerable magnitude. In the four smaller galleries stands of apparatus, the minor classes of photographs, and the transparencies are placed. Approached by a broad flight of stairs and well lighted, the galleries are admirably adapted for a photographic exhibition.

In writing of an exhibition such as that under consideration, the temptation to use a large supply of superlatives is obvious. We, however, shall content ourselves with very few. The Glasgow Exhibition is the largest and the best exhibition of photographs that we have seen. It accurately illustrates the present position of photography, no matter from which point of view you look at it. The all-conquering Mr. Craig Annan, with his beautiful imaginative picture studies and portraits, sets, as it were, the standard of quality for the exhibition, which, however, is really so good and so interesting as a whole, that, even assuming Annan and any other half-dozen prominent contributors to have held aloof, the remaining photographs would still have constituted a notable display.

The Awards.

The Judges were, for General Exhibition, Messrs. Valentine Blanchard, H. P. Robinson, George Shaw, Sir Francis Powell, P.R.S.W., Mr. William Young, R.S.W.; for Photo-mechanical Section, Messrs. James Maclehose, W. B. B. Blaikie; and the following are their awards:—

Portraits and Groups.—Gold medal, No. 291, W. M. Warneuke, Glasgow. Silver medal, No. 306, T. & R. Annan & Sons, Glasgow; No. 252, Percy S. Lankester, Tonbridge Wells. Bronze medal, No. 313, Charles Sweet, Rothesay; No. 718, Wm. Crooke, Edinburgh; No. 263, Harold Baker, Birmingham.

Landscapes, Seascapes, and Marine Subjects.—Gold medal, No. 104, J. Craig Annan, Glasgow. Silver medal, No. 120, C. F. Inston, Liverpool. Bronze medal, No. 125, Viscount Maitland, Lauder, N.B.; No. 126, F. A. Bolton, Oakamoor, Staffordshire; No. 90, W. Smedley Aston, Birmingham.

Architecture.—Silver medal, No. 508, John Stuart (Limited), Glasgow; No. 516, T. & R. Annan & Sons, Glasgow; bronze medal, No. 510, Harold Baker, Birmingham.

Animal Studies.—Silver medal, No. 600, W. J. Croall, Edinburgh. Bronze medal, No. 587, Fred Mackenzie, Glasgow; No. 604, Charles Reid, Wishaw.

Scientific.—Silver medal, No. 538, Robert Ayton, Edinburgh. Bronze medal, No. 546, Leslie Buchanan, M.B., Glasgow.

Flowers, Still Life, &c.—Silver medal, No. 691, George McDonald, M.D., Southall. Bronze medal, No. 689, Chas. Sweet, Rothesay.

Instantaneous and Hand Camera.—Silver medal, No. 572, A. Lindsay Miller, Glasgow. Bronze medal, No. 570, J. Kearney, jun., Liverpool; No. 578, C. M. Wane, Edinburgh.

Lantern Slides.—Silver medal, No. 750, W. A. Fraser, New York. Bronze medal, No. 732, Wm. Archibald, Newark, N.J.

Stereoscopic Work.—Silver medal, No. 773, Fred. Dunsterville, Madras. Bronze medal, No. 781, J. Hampson Spencer, Chester.

Enlargements (Portraiture).—Silver medal, No. 414, T. & R. Annan & Sons, Glasgow. Bronze medal, No. 412, H. Baker, Birmingham.

Enlargements (other Subjects).—Silver medal, No. 640, Charles Macdonald, Glasgow. Bronze medal, No. 415, W. J. Croall, Edinburgh.

Genre.—Gold medal, No. 436, J. Craig Annan, Glasgow.

Champion Class.—Gold medal, No. 361, J. Craig Annan, Glasgow; No. 372, J. Craig Annan, Glasgow. Extra gold medal, No. 371, Robt. Ayton, Edinburgh.

Ladies' Competition.—Awards withheld.

Photo-mechanical Section.

Photogravure.—Silver medal, T. & R. Annan & Sons, Glasgow. Bronze medal, the Autotype Company, London.

Colour Work.—Silver medal for illustrations printed from blocks of the Heliochrome Company, Limited, exhibited by Raithby, Lawrence & Co., Limited, Leicester.

Apparatus Section.

Silver Medals.—Moto-photographic Supply Company for animatograph: George Mason & Co., for exhibit of Eastman Cyclist Kodak.

Bronze Medals.—J. Lizars for hand cameras for films and plates; M'Ghee & Co. for novelty in apparatus.

The Classes.

Owing to the enormous number of the exhibits, our references to them must necessarily be somewhat brief.

Class I. (Portraits and Groups).—No collection of portraits at any Exhibition that we have previously seen compares for sustained excellence and power with that under review. The commercial element is conspicuously absent, and it is only here and there that excessive retouching and an indifferent pose is noticed. Carbon appears to be king of the printing processes employed, and the harmonious effect of what we may term the portrait wall is very fine. Mr. Warneuke's gold-medal picture, *Lady with Violin*, shows a seated figure in a graceful attitude; extreme softness of treatment is obtained, and, being printed in dark carbon, the effect is very good; still the young lady's feet, which appear to be uncommonly large, in our eyes somewhat mar the picture. The silver medal goes to Messrs. Annan's *James Guthrie, Esq., R.S.A.*, a Salon portrait, if we remember aright. *Doris* is the name given by Mr. P. Lankester, to the standing figure of a pretty, but dumpily garbed, little girl, for which he takes a silver medal. Bronze medals go to Mr. C. Sweet, for *Rev. Hugh Black*, a finely treated portrait of a clergyman, seated at his writing table, the lighting being most even and the pose very natural and free; to Mr. W. Crooke, for one of his engraving-like portraits of *Mr. Bispham*, and to Mr. Harold Baker, for a wonderfully pleasing study of a pretty child's head, *Geoffrey*. Recent entrants into the Exhibition arena are Messrs. Langfier, of Glasgow, who send some hundreds of photographs, large and small, to this Exhibition. In this class, with portraits of *Miss Minnie Hunt*, *La Loie Fuller* (a clever series of three character studies of the famous dancer), a charming study of *Mercia*, a powerful *Svengali*, and other examples of their undoubted skill, they must have only narrowly missed an award. Their work certainly deserved recognition. Miss Muriel Bell sends several contributions to the class distinguished by great refinement of treatment; her portraits, indeed, have a beautiful engraving-like character that is peculiarly agreeable to contemplate. There are several portraits by Mr. Frank Sutcliffe, and one of them is that of a lady, by the bichromated-gum process. It is extremely coarse in texture, and the process appears to us scarcely suited to the subject. In the portraits by Mr. O. W. Huntingdon, an American exhibitor, the flesh has a peculiarly agreeable softness that distinguishes his work from that of the other exhibitors; the effect appears to have been produced by taking advantage of the occasionally useful property of lenticular aberration. One of the most attractive pictures here is *Jean*, by Mr. Warneuke. It is the portrait of a chubby little baby, and the roundness and modelling of its limbs are full of realism. No prettier rendition of infantile grace is to be seen in the Exhibition. Conspicuous in the class are examples by Messrs. Byrne (child studies), R. Ayton, C. M. Wane, John Stuart, W. S. Aston, A. Clarke, and J. B. Johnson.

Class II. Landscapes, Seascapes, and Marine Subjects.—On the whole, not so strong in striking work as might have been expected. *On a Dutch Shore*, Mr. Annan's gold medal work, a tenderly treated study of Dutch fishermen, is, if we mistake not, an old Salon exhibit. *The End of a Stormy Day*, a red-toned seascape, won Mr. Inston the silver medal, and great charm and delicacy characterises Viscount Maitland's bronze medal river scene, *May on the Terne*. A bronze medal also goes to Mr. F. A. Bolton for *Homewards*, a poetically conceived photograph of a solitary pedestrian making his way across desolate country. *The Day's Work Done* (bronze medal), by Mr. W. Smedley Aston, a carbon print in a pleasant, pink tone, skilfully portrays a group of fishermen hauling in their craft. It is a most artistic study. The class might with advantage have been weeded out, as here and there we come across yellowed gelatine prints and photographs having figures disposed like ninepins, which mercy restrains us from naming. Messrs. H. W. Bennett (*Running before the Wind*, a realistic yacht piece), Professor Finlay (a blue carbon picture of a steamer drawing "*Wakes*"), J. B. Johnston (*A Wet Morning*, a good effect of cattle against misty hills), Alexander Allan (a clever photograph of *Rippling Waves*), Charles Sweet (a blue carbon of *The Yacht "Britannia"*) deserve special notice for their exhibits. Some of Messrs. Ralph Robinson's and Craig Annan's well-known works are also in the class.

Class III. (Architecture).—This must have been a difficult class to judge, so good and even are the exhibits. Messrs. John Stuart, Limited, carry off first honours with a large view in carbon, *The Hospital, York*. It is a capital rendering of a crypt-like subject, which lends itself

artistic treatment, and the result is highly effective, the exposure and lighting having been skilfully accomplished to secure an even result. A finely defined and illuminated billiard-room interior secures Messrs. Annan the silver medal, and the bronze goes to Mr. Harold Baker for another good bit of interior work, *The Beauchamp Chapel, Warwick*. Messrs. Bulbeck, Annan, J. Stuart, H. W. Bennett, Ruthven are seen at their best in the class, which does not contain a faulty entry.

Class IV. (Animals).—This class differs from most animal classes in that enlargements of lions and similar subjects so familiar to exhibition-goers are not in evidence here. Small work, indeed, is the rule, and there are some exquisite examples of minute definition and delicacy of treatment. Indeed, the class is characterised by rare excellence throughout. Mr. Croall's prize picture of *Sporting Dogs at Work* in the field is most realistic and truthful. Again, Mr. F. Mackenzie's bronze medal study of *Highland Cattle*, and Mr. C. Reid's *Studies of Cattle* (bronze medal), are among the finest we have seen of this description of work. These gentlemen evidently bring infinite skill and pains to bear in their efforts. The latter exhibitor has some minute studies of birds, *In the Glens*, which for brightness and sharpness could not possibly be excelled. We think, indeed, that Mr. Reid, a veteran animal photographer, deserved a higher award. Messrs. Landor, W. H. Pugh, and Robert Burnie worthily contribute to the class, which, as we have said, is a very fine one.

Class V. (Scientific).—Photo-micrographs chiefly monopolise this class, which, strange to tell, includes several ordinary views. The radiographs, which secure Mr. Robert Ayton the silver medal, are of human subjects, and, for fineness of detail, are extraordinarily good. They have all the crisp definition of lenticular images. The other award (a bronze medal) goes to Dr. Buchanan for a series of very skilful photo-micrographs of sections of the human retina, parasites, &c.

Class VI. (Flowers and Still Life).—Dr. M'Donald takes the silver medal for a capital reproduction of white roses, and Mr. Sweet the bronze for a study of flowers printed in carbon. The class scarcely calls for detailed reference. The entries are uniformly good, but it appears to us that this branch of photographic work has remained pretty much at a standstill during the last few years.

Class VII. (Instantaneous and Hand Camera.)—An unusually good class and free from uninteresting subjects, such as instantaneous views frequently turn out to be. Mr. A. Lindsay Miller, whose various works in the Exhibition are marked by fine artistic qualities of breadth and good composition, takes the silver medal, with some capital studies of *Scenes in the Harvest Field*. Mr. C. M. Wane's *Studies of Swans*, for which he receives a bronze, are clever. Mr. J. Kearney is also a successful exhibitor; and the exhibits in the class are good throughout.

Classes VIII. and IX. (Lantern Slides and Stereoscopic Transparencies).—The lantern slides appeared to us as somewhat below the average of those usually seen at exhibitions of this character, many of the principal workers not exhibiting. In the Stereoscopic Transparency Class, Mr. Dunsterville's Indian architectural subjects, Mr. Goodwin's flower studies and Mr. J. H. Spencer's Welsh views are of particular excellence. Some of the competitors, however, appear to have ignored one of the essential conditions of producing successful stereoscopic views, viz., the presence of a prominent object in the immediate foreground. Mr. A. W. Westrop, the old Indian worker, contributes some excellent Indian and other subjects to the class.

Classes X. and XI. (Enlargements and *Genre*).—Again remarkably good classes, awards going to Messrs. Annan and Harold Baker. We liked Mr. A. Lindsay Miller's fine study of *Haymakers*, the grouping of the figures in lifelike attitudes being wonderfully effective. Mr. Miller's pictures have qualities reminding us of George Clausen's works. In a series of three large bromide studies, Messrs. Langfier effectively narrate a love-letter episode, in which two charming girls play parts. Mr. John Reid has some well-rendered wave studies. Mr. Lindsay Miller's *Binding*, a figure study of a girl in the corn fields, is very skilfully executed. Several of Mr. Craig Annan's last year's productions are in the class, which includes notable works by Morgan & Kidd, and W. J. Croall, *Sunset on the Forth*, a very bold, well-chosen effect of light and shadow, for which he takes a bronze medal, while Mr. M'Donald takes a silver medal for a seascape illustrating Genesis i. 9–10. The *genre* medal is taken by Mr. Craig Annan for *The Church or the World*. Many of the American exhibitors contribute to the *Genre* Class, but they are outclassed by the British photographers.

Class XII. (Champion).—Two gold medals go to Mr. Craig Annan for *The Little Princess* and *A Ploughing Team*, both old pictures. The class is stronger than recent Champion classes that we have seen, and an extra gold medal is awarded to Mr. R. Ayton for a portrait of *T. M. Hay, Esq., R.S.W.* The sitter, who apparently has his overcoat on, is given a very natural standing position, and an artistic result, characterised by great freedom of treatment, is produced; nevertheless, the lighting of the face struck us as being a trifle hard. Mr. Bhedwar, the late R. Terras (*The Ghost Story*), Mr. R. W. Robinson, Mr. Harold Baker, Mr. Lankester, Mr. R. S. Webster, Mr. J. E. Dumont (humorous studies of monkish life) are well represented in the class. For the Ladies' Class no very notable pictures were sent in.

Trade Exhibits.

This section, so far as we are aware, is an innovation. The principal local professional photographers sent in large selections of their work for non-competitive exhibition, and a most effective display of all descriptions resulted.

Messrs. T. & R. Annan & Sons were represented by numerous portrait studies and copies of well-known pictures in carbon, photogravure, &c. A series illustrating the progress in construction of the Cunard liner, *Campania*, was also shown.

Messrs. Brinkley & Stevenson (Glasgow) and G. Comrie Smith (Giffnock), also sent capital selections of their work. Mr. Smith's portraiture stamps him as qualified to hold a position in the front rank of professionals.

The display of Messrs. Langfier, Glasgow, embraced hundreds of examples, the variety of which was bewildering. The firm has a large theatrical *clientèle*, and the very fine collections of portraits and character studies here brought togther are great testimony to the abillity and skill at its disposal.

Mr. W. Ralston, Glasgow, exhibited in the section some extremely good work, as did Messrs. John Stuart, Limited, who sent portraits, landscapes, interiors, and machinery subjects, illustrating both the varied nature of their business and the uniform excellence of their productions. A notable contributor was Mr. W. Warneuke, whose artistic and refined portrait work was well exemplified in the many specimens here hung. On the whole, this section of the Exhibition is decidedly interesting and useful, as it affords professional men the opportunity of studying each other's work and comparing it with their own.

Photo-mechanical Section.

Between the photogravure reproductions of paintings respectively submitted by Messrs. Annan and the Autotype Company, it appeared to us impossible to choose, but the Judges placed them first and second. Mr. Harold Baker also figured in the class. Colour work in three, four, five, and six printings by various firms, were exhibited by Messrs. Raithby Lawrence, and a medal was awarded to some very good examples of the first-named process by the Heliochrome Company. Specimens of half-tone were shown by the Scottish Engraving Company, Stevenson & Ogilvie, the Meisenbach Company, the Swan Engraving Company, and other firms.

In addition to many examples of bromide enlarging work, all of which exhibited the high qualities for which Messrs. Morgan & Kidd, of Richmond, are noted, the firm made a special display of collotype prints, in large and small sizes; these included reproductions of paintings, engravings, and photographs, sheets for show-cards, and view albums. Messrs. Morgan & Kidd's collotype work ranks with the best and is excellent alike in both its artistic and technical qualities.

The Autotype Company occupied one end of the large gallery with an imposing display of large work in carbon and photogravure. Copies of well-known paintings and a striking carbon enlargement of a negative by Lafayette of Her Majesty the Queen attracted well-merited attention.

The Apparatus Section.

No less than thirteen firms patronised the Apparatus Section, in which the Judges awarded four medals. Of the exhibitors, eight were local firms; and the visitor to this section could obtain a very good idea of what was newest on the market.

The old-established house of George Mason & Co., Sauchiehall-street, Glasgow, had a large and conspicuously placed stand in the centre of one of the smaller galleries, on which a great variety of goods were tastefully displayed. Hand and studio cameras, complete sets, lenses, enamellers and burnishers, washing apparatus, the Para-studio—an adjustable umbrella for outdoor portrait and group work, lanterns, shutters, chemicals, and dark room accessories were noticeable among the exhibit. A silver medal was awarded to the firm for an Eastman cyclist Kodak which was among Messrs. Mason's interesting exhibits.

The Albion Albumenising Co., of 128, Sauchiehall-street, Glasgow, had a case of apparatus, among which we noticed the "Aye-ready" camera, and many other useful items. Messrs. Bolton & Sons, Glasgow; P. Maloni (flashlight apparatus), H. Piquet (embossing press, &c.), Taylor, Taylor, & Hobson (a case of lenses), were also among the exhibitors.

Messrs. F. W. Verel & Co., Cathcart Works, Glasgow, showed numerous prints from negatives taken on their plates, also platinum-toned prints. An inspection of these assured us that Messrs. Verel's plates and papers are of very fine quality.

Messrs. McGhie & Co., St. Vincent-street, Glasgow, who took a medal for excellence of exhibit, showed some capital prints on their platinum-toned Solar collodion paper, and, in addition to a variety of other apparatus, some beautifully made studio and field cameras. One of the former, for 24 × 18 and under, appeared to us to have every possible movement, and for perfection and smoothness of working must be a most pleasant instrument to manipulate.

Mr. J. Lizars, of 101, Buchanan-street, Glasgow, made an effective exhibit with his well-known cameras and other apparatus, and was awarded a silver medal for a hand camera, the changing mechanism of which struck us as being very ingenious.

Acetylene generators comprised the exhibit of the Scottish Acetylene Company, of 1, Dundas-street, Glasgow. The generator of this firm has already been reviewed in our columns, and has many features of excellence.

Messrs. Otto Sichel & Co., of Bunhill-row, showed a studio camera of great excellence of construction, the workmanship and movements being remarkably good and easy.

Hand cameras figured in the exhibit of Messrs. J. F. Shew & Co., of 87 and 88, Newman-street, London, and comprised the Xit, the Eclipse, the Record Binocular, the Cyclist Binocular, &c. Messrs. Shew's cameras have the merit of extreme lightness and portability, and aluminium is largely used in their construction.

During the six weeks the Exhibition is to remain open lantern lectures are to be delivered by prominent photographers and others, and there is to be a nightly exhibition of animated photographs by Mr. E. P. Prestwich's moto-photoscope, which was awarded a silver medal by the Judges. The lanternist is Mr. James More, whose firm have a very interesting display of lantern and photographic apparatus on view.

ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION.

In fair weather the sixty-fifth Annual Exhibition of the Royal Cornwall Polytechnic Society was opened in the Hall, at Falmouth, on Tuesday, August 26. The President, Mr. T. Bedford Bolitho, M.P., was absent from England, owing to ill health. An acceptable substitute was found in Mr. Pendarves Vivian, a former President, who gave the opening address. Among those present on the platform were Lady Jane Vivian, the High Sheriff of Cornwall (Mr. F. Layland-Barratt), Lady St. Levan, Colonel the Hon. John St. Aubyn, the Hon. Mrs. Alcock, Miss A. M. Fox (the Foundress of the Society), Mr. J. D. Enys, F.G.S., Miss Patey, the Mayor of Falmouth, Mr. J. H. Collins, F.G.S., &c.; the Revs. A. A. Vawdrey, J. S. Flynn, B.D., and Canon Rogers; Mr. W. Brooks (Reigate), Capt. Target, R.N., Capt. G. H. B. Reed, R.N., Mr. P. Fletcher Watson (President of the Australian Academy of Arts), Mr. H. S. Hill (of Plymouth), Mr. E. Kitto (Secretary), &c. The doors were opened at eleven o'clock to members and the general public; the address was timed for noon. The President for the day was warmly greeted, and dwelt upon the various inventions that had been brought forward during the sixty years' reign of Her Majesty, who is Patroness of the Society, also the improvement in mining in the county, and other things that had been of benefit to the county. Mr. I. T. Cunninghame, Lecturer on Fisheries to the County Council of Cornwall, followed with some remarks on the fisheries of the county. The High Sheriff proposed a vote of thanks to the President, which was seconded by Colonel the Hon. J. St. Aubyn. In the great hall cases of rare miniatures are on view, also some very valuable handiwork of the Japanese, which is a great feature of the Exhibition. Most of these are from the Museum of Mr. Horniman, M.P., and the South Kensington Museum. On Thursday evening a lecture is to be given by R. Quick, Esq., M.I.S. (Curator, Horniman Museum), on *Japan and the Japanese Art*, illustrated by lantern slides, lantern under the management of Mr. W. Brooks (of Reigate). Other lectures and concerts are arranged for during the week, afternoons and evenings.

Photographic Section.—The Judges' Report.

The Judges again congratulate the Society on this year's display in the Photographic Department. Nearly all the classes are well represented except the Professional Landscape; the Architectural are unusually strong. In Professional Portrait Section, Mr. G. Lafayette, of Glasgow, receives an award of a first silver medal for his beautiful portrait of a lady, being a noble example of the art; he also sends another portrait which is well worthy of inspection. Mr. W. J. Byrne, of Richmond, Surrey, takes also a first silver medal for a beautiful group, *At the Opera*, printed in platinum, most artistically treated, being very soft and delicately lighted, the posing being admirable; the same gentleman sends also some of his well-known children's studies of which we have had examples in former years, and are gems in their way; he also sends two other portraits, one in red chalk, life size, taken direct, and the other in sepia, which are well worthy of careful study. Next in the catalogue is Mr. H. W. Bennett, who shows some very careful architectural work. S. B. Bolas & Co., of Ludgate Hill, London, are well represented in the architectural section, by a large series of cathedral interiors, No. 597, *The Chapter House, Lincoln Cathedral*, is a beautiful specimen, and perfect in every way, a first bronze medal has been awarded, the whole of the series are very interesting. Mr. Percy S. Lancester, of Tunbridge Wells, sends a goodly number of examples in portrait and landscape, a first bronze medal has been awarded to No. 608, *Grandmother*, which is a very realistic portrait of an old lady. Mr. W. Norrie is represented by three examples of cloud and sea studies. Mr. W. J. Ankhorn sends one picture of the *genre* order, *Home Made*. Messrs. Johnson Bros., of Henley-on-Thames, shows three examples of their work: *Camp Life on the Thames*, is full of life, and shows good manipulation. J. C. Douglas, of St. Ives, has a varied series, principally of cloud and sea studies, which are effective in their way. Mr. Richard Keene, of Derby, sends a series of landscapes of small size in his well-known style; the Judges would prefer to have seen some larger work for exhibition. C. Barrow Keene shows two examples. Mr. W. H. Pugh takes first bronze medal for animals, No. 639, two pet dogs, *Family Pets*. Mr. J. H. Coath, of Liskeard, a good series of *genre* pictures, No. 644, *A Bit for Bruce*, is a very happy composition; the whole of this artist's exhibits are well worthy of careful inspection. Mr. H. C. Warton shows good work. Mr. Fred. Marsh's, of Henley-on-Thames, exhibits are unique in their way, taken by flashlight, of rather large size, for work of the kind a special silver medal has been awarded to No. 661, *Warm Work*—the interior of a gas house, with man drawing retorts—he also sends several others; the smithy being capital, the means of them being taken by flashlight is well concealed, which is not generally the case in this class of work. Mr. Fred Coop forwards six examples of his work. Mr. E. Simmonds shows three specimens of his work which have artistic skill. Mr. F. Massey sends one picture in red chalk of good quality. Mr. W. M. Harrison has a large display of local views, portraits, &c., to his enlargement, No. 676, has been awarded first bronze medal, *A Wrecked Steamer in Falmouth Docks*, all his other work is very fine. Mr. J. Greet shows some good work. C. M. Wane is represented by two examples; a study of swans, and the other athletic sports; to this has been awarded a first bronze medal. Messrs. Blampey Bros., take a first bronze medal for portrait enlargement of a lady. Mr. C. Bellman has a frame of pretty landscapes. Mr. W. Brooks, of Reigate, contributes three examples of colour photography. Mr. J. H. Hogg shows some good work. Messrs. J. Bulbeck & Co., have been awarded a first bronze medal for No. 720, *Doorway of Roman Catholic Church, Bungay, Suffolk*, it is of a quality seldom seen, the detail being most exquisitely rendered, their other works are of great merit. Some specimens of Chassagne & Dansac's process of coloured photography are shown by the Company; where photography in natural colours comes in, one fails to see.

Amateur Section.

Mr. W. Luke Taylor shows some careful and artistic work; Mr. C. F. Inston is well represented by a large series, every subject being carefully treated, and showing great delicacy, especially those printed in carbon on opal; No. 748, *After Rain*, receives first broze medal. *The Doorway of Chapter House, Rochester Cathedral*, by Mr. E. R. Bull, takes a first bronze medal. A first bronze medal also goes to Alexander Old for a set of twelve half-plate hand-camera pictures, which are full of detail. *The Reredos, Truro Cathedral*, by Mr. Francis B. Kemp, shows careful work. Mr. W. M. Dodson contributes some good work, also Mr. B. Lyon. Mr. J. Kearney, jun., shows two frames containing twelve examples of hand-camera work, several of which are a little poor in quality. Maude C. Halkett exhibits some nice work, also Mr. W. R. Bland. Mr. G. E. Carter sends six examples of photo-micro work, very sharp and with perfect manipulation. Mrs. Jas. Blarney is represented by twelve examples of hand-camera work. Judging from the prints, the negatives appear to be of good quality; the prints are faulty, being almost untoned and too red, and the toning is very uneven; we hope to see an improvement next year. Mr. C. Court Cole shows some very exquisite architectural work, No. 787, *Divinity School, Oxford*, carries off first bronze medal; his other work is in his well-known style. No. 792, a flower study, *Margurites*, takes a second bronze medal; the arrangement is pretty and tasteful. Mr. G. Hepworth, of Brighouse, shows some delicate and artistic work; for a picture of *Castle Howard*, in frame No. 798, has been awarded a first bronze medal. Mr. T. C. Trounson, of Falmouth, shows some good hand-camera work of boats, &c.

Judges' Awards.

Professional Photography.—First silver medals: No. 582, Mr. W. J. Byrne; No. 589, Mr. G. Lafayette. Second silver medal: No. 661, Mr. Fred. Marsh. First bronze medals: No. 597, Messrs. S. B. Bolas & Co.; No. 608, Mr. P. S. Lankester; No. 639, Mr. W. H. Pugh; No. 644, Mr. J. H. Coath; No. 676, Mr. W. M. Harrison; No. 697, Mr. C. M. Wane; No. 698, Messrs. Blampey Brothers; No. 720, Messrs. J. Bulbeck & Co.

Amateur Photography.—First bronze medals: No. 748, Mr. C. F. Inston; No. 749, Mr. E. R. Bull; No. 754, Mr. A. Old; No. 787, Mr. C. Court Cole; No. 798, Mr. G. Hepworth. Second bronze medal: No. 792, Mr. W. Booth.

PHOTOGRAPHIC EXPORTS.

Compiled from the Customs Entries.

August, 1897.

Adelaide	£103	Brought forward	£2590	Brought forward	£4725
Alexandria	10	Delagoa Bay	7	Nelson	24
Amsterdam	16	Durban	313	Oporto	21
Auckland	221	East London	50	Ostend	10
Bangkok	361	Flushing	342	Otago	207
Barbadoes	19	Foochow	28	Penang	32
Bombay	756	Funchal	7	Port Elizabeth	248
Boulogne	79	Freemantle	67	Rangoon	56
Brisbane	18	Ghent	40	St. Petersburg	56
Buenos Ayres	165	Hamburg	133	Shanghai	345
Calcutta	322	Hiogo	39	Singapore	59
Cape Town	351	Hong Kong	192	Sydney	426
Christchurch	107	Kurrachee	189	Tientsin	100
Christiania	27	Madras	21	Trinidad	21
Colombo	7	Malta	29	Wellington	105
Constantinople	28	Melbourne	668	Yokohama	166
Carried forward	£2590	Carried forward	£4725	Total	£6601

August, 1896.

Adelaide	£69	Brought forward	£2343	Brought forward	£4294
Amsterdam	20	Flushing	382	Otago	15
Auckland	193	Freemantle	5	Perth	12
Bombay	498	Ghent	137	Port Elizabeth	130
Boulogne	60	Hamburg	102	Rangoon	14
Brisbane	226	Hiogo	173	St. Petersburg	31
Calcutta	247	Hong Kong	97	Shanghai	121
Canterbury	58	Jamaica	50	Singapore	69
Cape Town	395	Kurrachee	25	Sydney	747
Christchurch	32	Liban	26	Tientsin	19
Christiania	19	Lisbon	36	Trinidad	13
Colombo	172	Lyttleton	38	Wanganui	14
Copenhagen	69	Madras	51	Yokohama	523
Demerara	12	Malta	20	Zanzibar	20
Durban	230	Melbourne	799		
East London	43	Ostend	10		
Carried forward	£2343	Carried forward	£4294	Total	£6032

Our Editorial Table.

Christmas Mounts.

Marion & Co., Soho-square, W.

A large assortment of mounts suitable for Christmas and New-year's photographic cards has been sent us by Messrs. Marion & Co. The mounts are made suitable for attaching the photographs by means of an adhesive, and for "slipping in." Messrs. Marion's assortment this season is larger than ever, sizes being provided for pocket Kodak, midgets, *c.-d.-v.*, quarter-plate, cabinet, and half-plate, and either for upright or oblong. Artistic refinement characterises the designs and colours of these mounts, which should be in high favour among photographers cultivating the photographic Christmas card as an aid to business.

Bromide Enlargements, and how to make them.

By J. Pike. London: Percy Lund, Humphreys, & Co., Amen-corner. Price 6*d*.

This little book, which forms No. 13 of the publisher's popular photographic series, is the work of a competent hand, and is replete with sound information. The subject is exhaustively treated from end to end, and we can recommend the book to both beginners and proficients in photography. We note one item of information which gives the relative sensitiveness of two commercial brands of bromide paper as 1:24. That there is considerable variation in the sensitiveness of bromide papers is, of course, a matter of common knowledge; but we were not prepared, from our own experience, to find it so great as Mr. Pike represents it to be.

Views of London.

Photographed and published by Freeman Dovaston, 5, George-street, Euston-square, N.W. Price 1*s*.

In continuation of his excellent series of architectural photographs, Mr. Dovaston sends us an album of twenty-two views, in size about 5 × 4, of the principal public buildings in the metropolis—St. Paul's, Westminster, Trafalgar-square, &c. Pithy descriptive notes are given with the views, which are in half-tone from carefully taken negatives. The album is well printed and produced, and reflects great credit on Mr. Dovaston.

Specimens of Photographic Christmas Cards.

Wilfred Emery, 3, Soho-street, W.

Mr. Emery sends us specimens of photographs mounted on tasteful Christmas cards, together with an announcement that he prints and mounts negatives for Christmas and New-year's greeting cards, copies photographs for the same purpose, and supplies such photographs in various carbon colours.

The Association P.O.P.

The Photographer's Direct Supply Association, 157, High-street, Notting Hill, W.

We have received from the above-named firm a sample of a new printing-out paper of very good quality. It appears to have been carefully prepared and yields capital results. The ordinary sulphocyanide bath is recommended. The paper is supplied either cut or in rolls.

Catalogues Received.

Bicycle Kodaks is the title given to a neatly produced book issued by the Eastman Photographic Materials Company. It describes those cameras made by the Company that are suitable for carrying on the wheel, and illustrates the methods of attaching and detaching them. Those who are interested in cycling and photography will find *Bicycle Kodaks* full of useful information relating to the subject.

Messrs. A. E. Hoyles & Co., of 70A, Shakespeare-street, Nottingham, send us their illustrated catalogue of painted backgrounds, studio accessories, rustic furniture, &c. The illustrations depict many novelties in backgrounds and accessories. General apparatus is also dealt with in the catalogue.

Messrs. Arthur & Co., of 68, Prescot-street, Liverpool, send us their trade price-list for enlargements, printing, retouching, finishing, black-and-white, water and oil colours, pastels, and miniatures. The prices charged appear to be moderate.

The Thornton-Pickard Manufacturing Company, Limited, Altrincham, Cheshire, send us the latest edition of their descriptive portfolio and catalogue. This contains fully illustrated references to the Company's well-known shutters, cameras, &c., and includes some well-executed half-tone reproductions of photographs of the Altrincham works, and clever examples of instantaneous work, done with the Thornton-Pickard shutter, by the late Mr. Edgar Pickard.

E. G. Platt, Birkbeck-road, High-street, Kingsland.

Mr. Platt's delicately printed and produced catalogue describes, illustrates, and gives prices of his hand cameras, finders, field cameras, stands, camera fittings, camera bellows, lanterns, and many other items of photographic apparatus.

News and Notes.

Messrs. Bender & Langfier, of 242, London-road, Croydon, have just received, at the German Photographic Convention at Hanover, the first prize, silver medal, and diploma.

A new street lamp has been introduced by Messrs. Baxendale & Co., of Manchester. The speciality of this lamp is that the panes of glass are of a curved form, and are so focussed as to greatly increase the light given out as compared with the ordinary pattern.

We are sorry to learn of the death recently, at Turra Murra, Sydney, New South Wales, of Mr. J. Skinner, formerly of London and Glasgow. The deceased gentleman, who was once well known as an albumenised paper manufacturer and dealer, was in his seventy-seventh year.

Mr. W. D. Welford announces that he has retired altogether from the publication of *Cycle and Camera*, which will in future be carried on by Mr. R. L. Jefferson, at New Bridge-street, Ludgate Circus, E.C. For the present, Mr. Welford will carry on the Exhibition Bureau as usual.

Re William Strathearn Keddie, Photographer, 8, Wharf-street, Sowerby Bridge.—This debtor has executed a deed of assignment for the benefit of his creditors, under which Mr. J. N. Lister, accountant, Halifax, is trustee. The unsecured liabilities are returned at 155*l*., and the assets, after deducting the claims of preferential creditors, payable in full, are estimated at 81*l*.

A deed of assignment for the benefit of creditors has been executed by William James Sandry, Photographer, Treloxwarren-street, Camborne, under which Mr. Frederick Luke, Bank Manager, Camborne, is trustee. The unsecured liabilities are returned at 205*l*. and the assets, after deducting the claims of preferential creditors payable in full, are estimated to produce 100*l*.

A fire of an alarming character broke out shortly before ten o'clock on Sunday morning last, at St. James's House, St. James's-square, Notting Hill, W., on the premises of Messrs. England Bros., Limited, photographic mount manufacturers. At one time it seemed likely that the entire premises would be destroyed, but the firemen succeeded in restricting the fire to the basement. This portion of the premises, however, sustained very serious damage.

Colour Photography.—At the Falmouth Exhibition three of Mr. W. Brooks's transparencies in natural colours, to which we made reference some time ago, were shown on the screen, and were very enthusiastically received. We learn that they excited the admiration of Mr. Wallace Bennetto, who specially journeyed from Newquay to Falmouth to inspect Mr. Brooks's results.

The Ashton-under-Lyne Photographic Society's Third Triennial Exhibition will be held in the Town Hall, Ashton-under-Lyne, from November 22 to 27, 1897. The Hall has recently been handsomely decorated, and is brilliantly lighted by electricity. In addition to the Exhibition, there will be lectures, demonstrations, music, &c., each evening. It is not the intention of the Society to offer any prizes, but it will gladly defray the cost of carriage of all exhibits both ways, and insure them against fire whilst in its possession. If it is the wish of any exhibitor that his exhibits should be forwarded to any address other than his own, the Secretaries will be most happy to oblige. All exhibits must be addressed and sent in, not later than November 19, to the Secretary of Photographic Society, Town Hall, Ashton-under-Lyne.

TYLENE GAS IN SMELTING OPERATIONS.—In the German gold and silver office, some heating and smelting tests with acetylene gas were recently which are said to have produced highly satisfactory results. In a short emperatures up to 1500° C. were produced. A quantity of nickel was ı ready for casting within thirty minutes, while it is stated that ·ly it took from eighty to eighty-five minutes to melt the same quantity. nsen burner specially constructed for acetylene gas is said to have hed excellent results.

having been announced that Professor Church is to 'restore' the two stereochrome wall-paintings by Maclise—the *Nelson* and *Wellington*— Royal Gallery of Westminster Palace, we (*Daily Telegraph*) are asked te that further 'cleaning' of those great pictures is all that he has taken. No repainting or restoration will be attempted, nor, indeed, is treatment required. A preservative solution will probably be applied to both of the pictures, the work being carried out next month. Four of azed corridor paintings will also receive attention."

STARTLING ACCIDENT.—On the afternoon of the 30th ult. an accident ·ed on board the Japanese steamer *Ibana Maru*, lying in the Middles- h Docks, in which Mr. R. C. Clifford, Photographer, Middlesbrough, Ir. Sharp, were the victims. It appears Mr. Clifford was taking some graphic views of various parts of the vessel, when the flashlight mixture ied; Mr. Clifford's right thumb and Mr. Sharpe's face were more or less ly injured, and both were taken to the North Riding Infirmary, where Clifford was detained, his injuries being so severe that he may have to is hand.

·RETTY story is told of the Princess Frederica of Hanover, who resides mpton Court Palace. Her Royal Highness was being conducted through ate Apartments one day last week, and paused to examine West's paint- the Duke of Clarence (afterwards William IV.) and the Duke of Kent, ages of thirteen and eleven years—a picture which is hung, with many works of the once popular artist, in Queen Anne's Drawing-room. The ess was remarking upon the likeness between the Duke of Kent and the ıt Duke of York in his teens, when a young American was observed photographs near by. The Princess, through the Palace Superin- nt, expressed a wish to have a copy of the picture, and the young visitor ptly brought his hand camera into requisition. On Saturday he was ntly surprised to receive from her Royal Highness a gold scarf pin, set ies, together with a gracious letter of thanks.—*Daily Telegraph*.

NTIFICATION OF PRISONERS BY ANTHROPOMETRY.—At Birmingham the order of the Home Secretary as to the identification of prisoners was to force. A tailor named Norton was charged with attempting to pick ts, and the police, not being satisfied with his answers as to his ante- ts, asked the Bench to remand him to jail, and, in accordance with the Secretary's order, to require the governor of the prison to cause .er's photographs and measurements on the anthropometrical system to :en. In such cases the particulars are forwarded to the criminal registry in London, and search is made amongst the records to ascertain if any- is known against an accused person. Should it turn out that previous tions have been recorded against him, he can then be dealt with under evention of Crimes Act, and sentenced to twelve months' imprisonment. is the first order in the country that has been applied for, and it was d by the Bench.

UNFORTUNATE COINCIDENCE.—Joseph Ladue, owner of the Dawson , came down to San Francisco recently for a month's holiday. One day, his *fiancée*, he dropped in to look at a stereopticon exhibition, says a contemporary, where views of Alaska were shown. A few moments Mr. Ladue and the lady entered, the lecturer threw upon the canvas a e of a rough-looking man, in tattered garments, unshaven, and wearing cient straw hat upon his head. "This, ladies and gentlemen," said he, oe Ladue, one of the odd characters in Alaska. And this"—as he l another view—"is Ladue and his squaw wife. You will observe that has his pick and shovel, and is about to start on a prospecting tour." , who had been growing uneasy while the first view was being shown, d up at sight of the second, and denounced the lecturer as a fraud. with his *fiancée*, he left the hall. In consequence of the picture, how- Ladue and the young woman became estranged, and, though he after- succeeded in convincing her that he did not have an Indian wife, she d upon returning with him to Alaska to investigate for herself. There et a young Englishman, who afterwards became one of the Klondyke and husband of Ladue's betrothed.

TH LONDON PHOTOGRAPHIC SOCIETY'S EXCURSION TO IRELAND.—The ers who attended this excursion left Euston on August 13, travelling in ugh saloon carriage to Stranraer. The latter place was reached about he following morning, where the mail boat, *Princess May*, was found g. While the luggage was being transferred, some of the party took hots of the town, which is situated on the opposite side of Loch Ryan. urney across was made in good time, notwithstanding a stiff head wind ıg. On the quay being reached at Larne, a waggonette was found in ess to convey the members and their belongings to the King's Arms where justice was at once done to the breakfast which had been prepared. orning was spent photographing in and about the old town, locally known ·er. In the afternoon, the party drove to Glynn and Gleno. At the place, the members were soon busy photographing the street and water- On the return, the conveyance to be used by the party during the of the following week was selected. The start the next morning was d for two hours by rain, but, after starting, the spirits (of the party) onsiderably under the exhilarating breezes of the ocean while driving the coast road, passing Ballygally and O'Halloran's Castles, Garron and Point, thence to Glenarm, where a stay was made for luncheon, few of the principal objects photographed. The journey was then ued through Carnlough, Waterfoot, and Redbay to Cushendall, by time every one was ready for the dinner which had been prepared by stess at the Glens of Antrim Hotel. Not content with travelling and photographing on a twenty-six miles journey, some of the party endeavoured to lengthen the day by rowing, at a late hour, into the bay in the moonlight. On the following morning, some of the most energetic were out at an early hour prowling about the neighbourhood with their cameras to obtain pictures of any subject which took their fancy. After breakfast, they journeyed in char-a-banc to Redbay, thence up to the Tea House at Glenariff. Here a stay was made while pictures were secured of the waterfalls, rumbling holes, the rustic bridge, &c., some members finding it necessary to avail themselves of the dark room which is provided in the Glen. On returning to Cushendall, the fair was found to be in full swing, and the members who had furnished themselves with hand cameras found plenty of material upon which to expose their plates. After a late dinner, the char-a-banc was again taken, and the journey continued up the Cushendall Valley, thence over the Glendun Viaduct and the mountain top into Ballyvoy and Ballycastle, where the party stayed two nights at Hunter's Antrim Arms Hotel. The next morning, those who ventured out to Bonamargy Abbey and the Warren were caught in a smart shower, after securing their pictures. At 9.30 the conveyance was taken through Ballyvoy and on to Cross Farm, where the conveyance had to be left, and the trip to Fairhead completed on foot. After starting, the party was caught in a "wee skiff," and had to shelter themselves for a short time under a stone wall. The weather cleared up, and, on reaching Fairhead, work was soon commenced on the Grey Man's Path, the rocks close by, and views looking over Murlough Bay, and across Loch-na-Cranough, with Knocklayd in the distance, the cloud effects adding greater interest to the pictures. After breakfast, on Wednesday morning, a start was made for Kenbane Head and Castle, where a fair number of exposures were made, and the journey was then continued to the famous Rope Bridge of Carrick-a-Read. Some of the party ventured across the bridge and secured pictures from both sides. From here Ballintoy was reached by the footpath running along the cliff, and the hand-camera men were again in their glory, securing views of the streets, cottage homes, and peasants. After refreshment, the excursion was continued to the Giants' Causeway, which was reached shortly before sunset. Some of the members endeavoured to secure pictures of the clouds surrounding the setting sun, as it went down over the mountains of Inishowen. At the Causeway, meals were served at Kane's Royal Hotel, and the party lodged in the Overflow House, which, during the stay, became to be known as "the Club-house," the members being the sole occupants for the time being. Next morning all were busily occupied in taking photographs of the points of interest in and about the Causeway, which occupation they continued notwithstanding a short downfall of rain. The afternoon was spent in various directions, some of the members travelling to Portrush to obtain a fresh supply of plates, while one remained behind in the arms of Morpheus. On the Friday morning the conveyance was taken as far as Bush Mill, where jaunting cars were engaged to take the excursionists to make a few exposures at Dunluce Castle and on the rocks, caves, and arches at White Rocks. The journey homeward was then commenced, and the Inland Road was taken to Ballycastle, and, after a short relaxation and a few exposures had been made, the journey over the mountains was continued, various stoppages being made *en route* to enable the hand-camera men to secure reminiscences of points of interest, and the peasants engaged in their occupation of cutting sods, carting peat, and filling the dams with flax. Cushendall was reached about eight o'clock, and, as usual, every-body was ready for the hot repast which had been prepared for them. At six o'clock the next morning some, who were eager for work, were again out, and Layd Old Church was searched for and ultimately found. Exposures were made on the ruins and the Macdonald Cross. Other members ventured out in various directions. After breakfast groups were taken outside the hotel, and then, with the char-a-banc, the party started again along the coast road, stopping at Garron Tower, where, by special permission, the party were shown over the house, and its treasures displayed for their inspection. A few exposures were made on the house and grounds, after which the trippers soon found themselves again in Glenarm, where luncheon was partaken of. After lunch the conveyance was stopped a few times along the coast road to enable additional exposures to be made, and ultimately Larne was reached about half-past four. Tea, which was found to be in readiness, was soon disposed of. After the purchase of a few mementoes, the party were driven to the quay, where they joined the *Princess Victoria*, and after a wet passage arrived at Stranraer. The train was at once entered, and London was reached about nine o'clock on Sunday morning, having completed eight full days in Ireland, photographing a great variety of subjects and scenery. The excursion was most successfully carried out under the leadership of Mr. Howard Esler, of *Peaceful Old Age* and *Bachelor Life* fame, and the whole of the party were so satisfied with the outing that they expressed a wish that the trip should be repeated on another occasion. The thanks of the members are also due to Mr. Henry McNeill, of Larne, who made and carried out the whole of the arrangements for the travelling, housing, and provisioning of the members during their stay in the "distressful counthry."

Patent News.

THE following applications for Patents were made between August 25 and September 1, 1897:—

CAMERAS.—No. 19,474. "Improvements in Photographic Cameras." Complete specification. P. K. STERN.

CAMERAS.—No. 19,503. "Improvements in or relating to Photographic Cameras." Communicated by W. Bruns. Complete specification. A. J. BOULT.

ANIMATED PHOTOGRAPHY.—No. 19,805. "An Improved Apparatus for the Taking and Exhibiting of Animated Pictures." C. R. NEVE.

PRINTING APPARATUS.—No. 19,814. "An Indicator to Attach to Photographic Printing Frames or the like, to show when Prints or the like are nearly done." H. PIQUET.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
13	North Middlesex	*Toning of Platinum Prints.* E. C. Hertslet, F.R.P.S.
14	Birmingham Photo. Society	Exhibition of Competition Pictures for July Excursions.
14	Hackney	*Negative-making.* J. A. Hodges.
15	Leeds Camera Club	Beginners' Night: I. *Choice and Use of Apparatus.* C. C. Vevers.
16	Bradford Camera Club	Lantern-slide Competition: Criticism and Judging by Members present.
16	London and Provincial	*The Queen and the Riviera.* A. L. Henderson.
17	Croydon Microscopical	Conversational Meeting.
17	Wakefield	*McKellen's Infallible Hand Camera.* J. McKellen.
18	Bolton Mutual Photo. Society	Excursion: High Rid, Heaton, and Bob's Smithy. Leader, Mr. Patterson.
18	Hackney	Excursion: Waltham Cross. Leader, W. Selfe.
18	London and Provincial	Annual Outing: Bull and Bush, Hampstead.
18	Photographic Club	Saturday Outing to Hampstead Heath.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 2,—Mr. E. H. Bayston in the chair.

The HON. SECRETARY called attention to some cloud negatives sent up by Mr. Henderson in connexion with the subject for the evening. Two were in carbon, by Mr. Wicks, of Brighton, and the third had been made for him by Mr. Dunmore, and was pencilled in on a sheet of ground glass.

Mr. W. D. WELFORD communicated a paper on

CLOUD NEGATIVES, AND DOUBLE PRINTING BY A STRIPPING PRINT-OUT PAPER, which has appeared elsewhere. Several examples in the various stages of the process were shown. It was remarked by the lecturer that the majority of the cloud negatives to be had commercially were of the cumulus sort, which, for pictorial work, were not to be compared with the strata or streaky clouds.

Mr. J. E. HODD inquired as to the use of the Novitas paper for the transparency in making enlargements, and whether the grain in the latter showed up very much. It was made the subject of a claim.

Mr. HARVEY said that it was recommended by Mr. Hodges to use chrome gelatine in place of the gum arabic for securing the film to the support, and he had tried this, and found it to answer in the few transparencies he had made.

Mr. HODD said a weak solution of Le Page's glue in water would be found very satisfactory for the same purpose.

Mr. E. J. WALL mentioned a point which had not been touched upon, and that was with regard to the final tone of the print in the case of double printing. His experience had been that, with printing-out paper, and using one of the commercial cloud negatives—such as Mr. Henderson had shown—one got a different colour to that given by a negative which has in it any pyro stain, and he should like to know whether this Novitas paper would give exactly the same tone to the clouds as the negative which has its own sky in it naturally. Of course, printing-in might be very nice, but he always preferred to get his negatives with clouds in them, and generally managed it, although they might not be "pictorial," as now understood.

Mr. WELFORD, in reply, said he should not be in favour of the use of the Novitas paper for the transparency in making enlargements, as there was a certain amount of grain which would not be found in a dry plate. The difference between the colour of the cloud and the foreground was bound to be felt, platinum being about the only exception. As far as possible he got cloud negatives requiring as long to print as the foreground itself. He would not dream of using the original cloud in the negative in pictorial work, but would use a cloud negative to suit the subject.

Mr. R. BECKETT expected to hear something as to the best way to set about taking cloud negatives, the sort of clouds to aim for, and the kind of negative most suitable for printing from. In his opinion clouds as a general rule should be unobtrusive, and the sky should in most cases represent the strongest light in a picture, and this was not always the case. To have the water lighter than the sky in a print was a nuisance.

Mr. MACKIE and Mr. WALL joined in saying that water often appeared lighter than the sky, and a picture showing such a state of things need not be untruthful.

Mr. E. BANKS thought the process of making the reversed negative unnecessarily intricate, and described one which was simpler and less costly, in which the reversed negative was taken direct from the original negative. For this purpose he takes any old gelatine dry plate, of which there are generally a number knocking about, and dips it in a two per cent. solution of bichromate. The plate is dried and printed under the negative until a deep image exists, when it is washed in water to free it from the bichromate salt, and taken into daylight and developed in the ordinary way. By this means a perfect reversed negative can be obtained, which very often is superior to the original itself.

Mr. J. E. HODD asked for an explanation of the fact that the deposit of a slow lantern plate was whitish by reflected light.

It was attributed to the action produced by prolonged development on a plate which, in such a case, is always whiter by reflected light than normally developed negatives, and is the result of the molecular condition of the deposit.

PHOTOGRAPHIC CLUB.

SEPTEMBER 1,—Mr. W. R. Stretton in the chair.

This was the first formal meeting since June, the meetings during July and August being of an informa character, no minutes being taken and no reports sent to the press. Owing, however, to the inclement weather and the numb of members absent holiday-making, the attendance was small.

Mr. BRIDGE said he was sure the members would be sorry to hear of t illness of their Recorder (Mr. S. H. Fry), who had to visit a hydropath establishment. As, however, it was necessary to record the meetings, he (M Bridge) had asked Mr. Welford to take Mr. Fry's place. This Mr. Welfo was willing to do until some arrangements could be made.

It was decided to hold the annual outing as usual at Hampstead Heath September 18, tea at the Bull and Bush Hotel, the usual invitation being se to the London and Provincial Association.

Mr. BRIDGE, referring to the Chassagne-Dansac colour process, said he w endeavouring to describe it to a friend, and a little girl said, "Oh, I have some pictures that you colour like that." She brought Mr. Bridge a book printed line illustrations, all that was necessary being to rub a wet camel hair brush over the lines, when the colours appeared. He had secured t book and showed it to the members present, and, as there happened to be page untouched, several members tried their hand, with complete succe The colours are not visible in the paper before the use of the brush, a appear to be embodied in the ink.

Mr. FOXLEE said the book showed how easily people might be deceived, a that it had one special merit, the colours came in the right places.

Much amusement was caused by the respective members' artistic effo with the brush, and considerable chaff took place as to the selectiveness the colours.

Mr. FOXLEE afterwards gave a few details of some of the historical exhil at the Crystal Palace, and promised to read a full paper upon the subject little later on.

Wakefield Photographic Society.—Through the kindness of the offic and members of the above Society, which includes a large number of pro sional and amateur photographers, in Wakefield and the district, a goo number of persons were on September 2 and 3 afforded a treat of no m order. The Society made arrangements to hold exhibitions and *conversazio* on both days in the Mechanics' Institution, and the first of these took place Thursday evening. Notwithstanding the unfavourable state of the weat many persons availed themselves of the Society's invitation, and others p for admission. The arrangements were admirable, the exhibition was splen and every one seemed much interested and delighted. A very large collec of photographs of almost every size, and illustrating every process of mod photography, had been got together, and these were arranged in a ma which enabled the visitors to inspect them without the slightest inconvenie Numerous groups of photographs were arranged on the walls, which ve draped and ornamented with art muslin of various tints, tastefully arra by Messrs. Hall and Armitage. Mr. J. Dunnill's band was on the platfo and, under the conductorship of that gentleman, executed choice selectio of music in a most efficient manner. Nearly all the officers of the Society, several of the members, were in attendance, and promptly and courteo gave any information with reference to the views and the process by w they had been produced. Mr. W. T. Wilkinson, who acts as President Honorary Secretary of the Society, ably filled the post of Master of Ceremonies, and he was well supported by the late President, the Rev. Asp Addison, Chaplain at Her Majesty's Prison, who, with Mr. H. M. Br now act as Vice-Presidents. The Committee were present almost in full fo for we noticed Mr. A. W. Stansfield, J. P., Major Norwood, Mr. J. H. Cha Mr. C. Miles, and a few others. The opening ceremony on Thursday eve which was very brief, was performed by Mr. Wilkinson, the President Honorary Secretary. Ascending the platform and addressing the audienc explained that the member for the city had been written to and request to open the Exhibition, but no reply had been received to the invitation, other gentlemen who had been asked to discharge the duty were away on holidays, and therefore that ceremony would be of an informal char He was very pleased to see such a good collection of photographs, espe the collection shown by Mr. Isaac Briggs, J.P., of Sandal, who was one oldest amateur photographers in the West Riding, and the oldest mem of the Wakefield Photographic Society. The pictures shown there that ev by Mr. Briggs would do credit to any gentleman. The loan collection se the committee of the Affiliation of Photographic Societies, with which Wakefield Society is connected, were supposed to be the pick of the exhibitors in England and the Continent, but to some people they might rather insignificant. It should be borne in mind, however, that they supposed to be pictures, not photographs. In addition to the loan colle of photographs from the affiliated committee of Photographic Societie referred to, there were photographs by Messrs. G. & J. Hall, Mr. Briggs, J.P., Mr. I. Briggs, jun., Mr. Harold Briggs, Major Norwood, M H. Chaplin, Mr. J. Wilcox, Mr. Robson, Mr. Miles, Mr. Tattersall, Mr. Mr. G. H. Wood, and the Hon. Secretary (Mr. Wilkinson). The photog shown by Mr. Isaac Briggs, J.P., and specially commended by the Pres were a grand lot. Amongst Mr. Briggs's exhibits were two collectio photographs of leaves of fine foliage plants, ferns, &c., taken without t of either camera or lens, the impressions having been obtained by placi leaves on sensitive paper. Between the two lots of pictures just men was an extensive and beautiful collection of photographs, including a scene in Mr. Briggs's carriage drive, a winter scene in the lane near S Castle before the fine large trees were blown down, views of Newmille Whitby, Bolton Woods, and the Strid, Fountains Abbey, Knaresbro pretty gardens at Saltburn, the Fairy Glen at Bettws-y-Coed, Eastbourn On the opposite side of the saloon, and facing Mr. Briggs's exhibits, M G. & J. Hall had a most attractive display. On their stand we not striking photograph in bas-relief of the late Bishop of Wakefield, produ an American invention. There were also choice specimens of the be most modern styles of photography, produced by the crayon, red chalk, carbon, and platinum processes; toned prints, enamels, &c. This stan a great attraction, for the specimens exhibited were up to date, an maintained the high reputation which this old-established firm hav

oyed. Mr. Issac Briggs, jun., and Mr. Harold M. Briggs showed some y fine work for amateurs; and Major Norwood's views of Fountains Abbey, dlington Quay, and other places, were amongst some of the bonniest bits the Exhibition. Mr. Chaplain had some well-executed views, taken in ronshire and Essex; Mr. G. H. Wood showed capital photographs of various ces at Heath, Sandal, &c.; Mr. C. Miles, of Haigh and other local spots. e other exhibitors, named above, all put forward some well-developed tures, of which they might feel justly proud. The great attraction was, st undoubtedly, a first-class set of about a score cinematrographic views, ained by Messrs. R. J. Appleton & Co., of Bradford, with an instrument heir own invention, and cleverly exhibited by them on a screen, whilst the id executed appropriate selections of music. The marvellous animated otographs created much amazement and amusement, provoking hearty plause and roars of laughter. A street scene was followed by a repre-itation of a duel, and a ghost scene, a skirt dance, bathing at sea, acrobats, . A representation of high tide on the rocks at Flambro' Head was very listic, and so also was a steeplechase, a kissing performance, a railway tion platform, and an unfortunate fisherman. Five views, illustrating tions of the recent Jubilee procession in London, were very greatly admired. hen the Queen's carriage with the escort of Princes was thrown on the een, the band played "God Save the Queen," and the audience gave some rty applause. The Prince of Wales, the Duke of Cambridge, and Lord lseley were prominent in the procession, and were easily recognised by ny in the interested assembly.

FORTHCOMING EXHIBITIONS.

1897.	
t. 10–Oct. 13.....	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
27–Nov. 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
tober 4.....	Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
cember 9–11	Aintree Photographic Society.
1898.	
ril.....	International Photographic Exhibition (Crystal Palace) R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

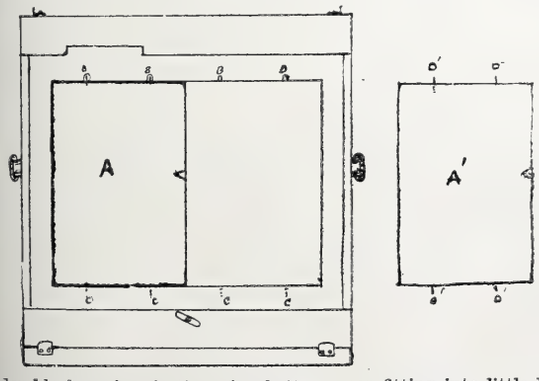
Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

MAKING SEPARATE EXPOSURES ON ONE PLATE.

To the EDITORS.

GENTLEMEN,—Enclosed with this is a sketch of my invention (Provi-nal Specification, dated June 18, 1897, No. 14823) showing the sition of block in camera. It is placed first on the one side and an posure made, then block transferred to the other side and another posure made, and by that means, getting a separate photograph on



', wooden block; D' projecting pins, bottom ones fitting into little holes, C, and ones fitting into slots, B.
, showing the position of block when fitted in back of camera.

h half of the plate. It is very light, and can be carried in the camera, y to use and very useful if going out. Can be fitted to any camera udio or outdoor).

Should be glad if you could find space to reproduce the sketch in your luable medium.—I am, yours, &c. D. KNIGHTS WHITTOME.

St. Ethelbert's, Castle Hill, Hereford, August 30, 1897.

[The idea of our correspondent for enabling, by means of a vable block, two separate exposures to be made on one plate, is cellent. At the same time we hope we may be pardoned for inting out that the principle of the idea is not new. We have quently seen cameras fitted with a sheet of ebonite, half the size the plate, that could readily be moved from side to side.—EDS.]

COLLODION BACKED PLATES.

To the EDITORS.

GENTLEMEN,—I suppose I am expected to reply to Mr. Webster's challenge, which appears in your impression of September 3, page 566, *re* "Collodion Backed Plates." In the first place, let me say I am afraid my explanation or apology will be "worse than the offence." I think the reporter at the meeting in question must have mis-reported what I said; I usually couple a strong adjective with ridiculous. Well, here goes. I do not often apologise, but I must make an exception on behalf of the reporter and myself. I am very sorry Mr. Webster may not believe me when I say I did not know who your correspondent was when I replied to your expressions about backing plates; this should not enter into the merits of the case. I had no idea that Mr. Webster was so sensitive; it is very evident that we do not *know* each other; doubtless, Mr. Webster has had some difficulty in removing the collodion, I have had none. He admits that "there are collodions and collodions," and this may account for our experiences. Moreover, the developer may make a difference; *i.e.*, the kind of alkali used. Soaking a plate in water for ten minutes, with the view of removing the collodion, is not equal to soaking in alkali, yet I believe what I have stated could be done easily. What are we to gain by the contest? Certainly, no scientific knowledge. I should be sorry to deprive the Benevolent Association of a donation. The contest will only prove that Mr. Webster can remove the backing quicker than myself, or *vice versâ*. I would have thought that half or one hour's extra labour on a dozen 12×10 plates would not be considered when quality should be the first. Surely, Mr. Webster is clever enough to devise a method of cleaning the backs of plates without "breaking or damaging the films." Let Mr. Webster throw out a fair challenge, not plain water against an alkaline solution or abrasion, and I will readily accept. I would not like to hear of Mr. Webster joining the "touch-button brigade." I am afraid there is too great an inclination on the part of professional photographers to have things made easy, that they deprive themselves of a great pleasure. When I was professionally engaged, I made my own plates, chloride of gold, sometimes the silver nitrate, and many other preparations, enamelling, held the reins of a large business, and even then found time for research. I now purpose working out a method of "touch button" that in effect will put the plate in the slide, expose, develop, print, mount, deliver, and return cash, &c., &c. I may hope to have Mr. Webster as a co-operator. Now, he may call me ridiculous, and put as many of the fourth letter of the alphabet in front as he likes. It will not offend yours truly,

A. L. HENDERSON.

Old Waverley Temperance Hotel, 42, 43, 44, 45, *and* 46, *Princes-street, Edinburgh, September* 7, 1897.

AMATEURS COPYING PROOFS!

To the EDITORS.

GENTLEMEN,—I am not a little surprised that no one has hitherto written *re* the above subject; doubtless, many, like myself, have been duped by so-called *gentlemen* amateurs.

The latest example of such imposition has just come under my notice. Not long ago I took a number of views of a regatta which are universally admired, not only by the general public, but by the owners of the yachts, with one exception. This exception is not only the owner of a small craft, but is also a prodigy in amateur photography! This individual sent for a set of my views on approbation, and in a few days returned the lot with thanks. They were received by him all right, but so badly packed for return journey that the damage done in transit rendered them unfit for sale. As this gentleman was a member of a firm of some pretensions in one of the largest cities in England, I did not ask for a deposit according to my usual custom, but trusted to his honour. On receipt of the photos, I wrote him, stating the condition they were in and asking for the amount I had spent in postage *at least*. In reply I received a letter, first paragraph of which was a conglomeration of excuses, evasive remarks and regrets. but ending, like the tail of a rattle-snake, with a sting.

Before closing his amusing missive, he informs me that he has taken a number of photos of the same regatta himself, which he had distributed among his friends; but he omitted to state that copies of mine were among the number!

I have known other instances of friends to amateurs coming to sit for one photo, which was afterwards copied by the amateur for general distribution, and frequently enlarged and sold by them for a trifle over cost price.

Words are thrown away upon such people; there should be an effective way of preventing such mean actions. If you will kindly throw your columns open for suggestions, it will be a service rendered to the profession. As an old subscriber I find you are always ready to decry the wrong and uphold the right.—I am, yours, &c., OPPROBRE.

THE LAY PRESS AND PHOTOGRAPHY.

To the EDITORS.

GENTLEMAN,—The following incident will tend to confirm your remarks respecting the reliable accuracy of newspaper articles on photography.

Many years since, when I was a frequent attendant at the photographic meetings, I noticed at one of them a stranger listening attentively to the subjects before the Society. A short time afterwards I saw him at a reception, and introduced myself for a little congenial chat, presuming that he was interested in photography; he replied that he did nothing in it, he was writing an article on the subject for a leading paper, and he attended the meeting hoping to secure something to assist him in the matter.

Referring to the succeeding paragraph, a short time since I was at Mr. Henderson's, at Brimsdown, where a number of pigs were kept in a large enclosure. I was struck with the unusual and peculiar colour of the animals, which induced me to ask him whether this was due to the pigs eating the photographic refuse about the yard.—I am, yours, &c.,

FREDERICK YORK.

67, *Lancaster-road, Notting Hill, W., September* 4, 1897.

"COSMOS" CRITICISED.

To the EDITORS.

GENTLEMEN,—I notice, in your JOURNAL for August 27, that "Cosmos" takes exception to the intellectual fare provided by the Conventioners of America, quoting a speech of one of the members to support his grumble—but, really, those who live in glass houses shouldn't throw stones, for "Cosmos" goes on to refer to Mr. Bennetto in a paragraph which is in very bad taste, as well as profane—a *proof*, I suppose, of what an *English* photographic writer puts before *his* readers.

I notice that "Cosmos" always gets an attack of the spleen as the time draws near for another Salon. Cannot a subscription list be opened to send "Cosmos" away for the next few weeks?—I am yours &c.,

The Rembrandt Studio, 39, Eastgate-street, Gloucester, PAUL COE.

September 6, 1897.

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—A fortnight ago there was a letter in your JOURNAL complaining of the way in which applicants are treated when sending specimens to photographic firms. I beg to say that your correspondent's case is by no means an accidental one. I have been treated myself many times in a very similar manner. I have sent in reply to advertisements my own portrait as a specimen of my own work, and have asked if I might be favoured with their return as early as possible, and after having been kept a week, have had to send a postcard for its return. Nor even then has it been returned. The enclosed I received this morning. I quite agree with your correspondent that the time has arrived when assistants should do something to put a stop to this arrogant thoughtlessness or indifference on the part of certain firms. I sent my photo as a specimen of my work to a certain firm several weeks ago, and, although I have written since for the return, I have received no reply whatever. Trusting that more thought will be taken for the future,—I am, your, &c. C. WAITE.

Leighton-road, Cheltenham, September 1, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Francis H. Agnew, 45, Bridge-street, Glasgow.—*Photograph of Rangers' Football Club.*

W. G. Hooper, The Studio, Tuckton, Christchurch, Hants.—*Photograph of group, entitled "Something funny."*

Charles H. Evans, 12, St. Helen's-road, Swansea.—*Photograph of the late Archdeacon Griffiths, (late) Rector of Neath.*

R. HILL.—No.

COPYRIGHT.—F. C. MILES. Yes, we believe the copyright so applies.

LATENOS.—We think you were justified in complaining.

P. R. S.—We have been given to understand that they are genuine. More than this we are unable to say.

WILLITS (South Shields).—1. Not yet an article of commerce, we believe. 2. Messrs. Zeiss have not yet issued the lens.

RETURN OF SPECIMENS.—OPERATOR. We fear you have no remedy, as you appear to have sent the specimens without being invited to do so.

J. W. WILLAN.—We do not think the trough described is an article of commerce; it would have to be specially made as suggested in the article.

ELEMENTARY BOOK ON LENSES.—C. WAITE. There is a book on the subject by Mr. John A. Hodges, published by Messrs. Hazell, Watson, & Viney, Creed-lane, which may suit you.

R. MATHER.—Metol is usually recommended as an addition to the pyro for the purpose named. It is a moot point, however, whether the advantages claimed are actually realised.

COPYRIGHT.—C. H. F. It is not necessary that the word "copyright" should appear on the photograph in order that proceedings might be taken for the infringement of a copyright photograph.

PAUL COE.—1. The Westminster Fire Office, King-street, Covent Garden, offer photographers favourable terms, we believe. 2. We have grown tired of making references to the subject of your enclosure.

TONING P.O.P.—ONE IN A FIX. We cannot say why you fail to "get a tone." If you follow the instructions sent with the paper you employ, you will get good tones. Evidently you do not do that, but where you have departed from them we are, of course, unable to say.

STUDIO.—T. J. EVANS. A studio, twenty-eight or thirty feet long and thirteen or fourteen feet wide, will be suitable for professional purposes. It may be either of the ridge roof or "lean-to" form, according to the aspect and surrounding conditions. Five feet or five feet six at either end—roof and sides—may be opaque and the rest glass.

STAINED NEGATIVES.—THOS. MULLENS. If the stains on all the negatives are the same as on the pieces of the one sent—for it arrived in many pieces owing to the way it was packed—they are due to imperfect fixation. Either the solution was too weak or the plates were left too short a time in it. As the negatives have been exposed to light—the stains cannot be removed.

GROUP IN CONFINED SPACE.—M. BIDEN. A lens of the rapid type of seven inches focus, if a good one, will take a group, on a whole-plate in the short space at your disposal. But it will have to be used with a very small stop, or it will not cover the plate. Of course, the small stop will entail a long exposure; that naturally follows, but it cannot be avoided. Use very rapid plates for the job.

CUSTOMS HOUSE.—ZERMAT says: "Will you kindly inform me, through your Correspondents' column, if any difficulty will be experienced in going to Switzerland from here with camera, &c., and six dozen or a gross of plates from the Customs House, or duties payable?"—No difficulty will be experienced if the parcels of plates are duly labelled as photographic plates, and a polite intimation given to the Customs officials that they will be spoilt if opened in daylight.

SPOTTY PRINTS.—COLLODIO-CHLORIDE asks: "We shall be pleased if you can throw any light on the cause of spots as showing on enclosed print. They come up about twenty-four hours after being toned and fixed."—The spots have all the appearance of being caused by particles of pernicious matter, as dust, settling on them while in a moist condition. It is noticeable that many of them have a decided nucleus. We have, however, seen very similar spots to these, which were traced to the use of impure hyposulphite of soda.

ARTIFICIAL LIGHT.—BETA asks: "Would you kindly advise me as to the lighting of a studio 24×16? Would I be able to take portraits with incandescent gas burners, say, seven or eight? How should they be arranged: all along one side, at a moderate height, or in the middle?"—It is quite possible to take portraits with incandescent burners, but we should advise, at least, double the number mentioned to be employed. short exposures be a desideratum. They had better be arranged in two tier, say, a dozen on one side of the sitter—some distance in front—half a dozen on the other.

PLATINOTYPE.—W. BERRY writes: "I have tried the printing-out platinotype process, and have been using Rives paper (sample enclosed). I find it is very tender in the acid bath. I think a paper heavier-sized would be better to keep the image more on the surface. What kind would you recommend? I have applied to two publishers for Pizzighelli & Hubl's book; they say it is out of print."—It would seem from the print sent that you have omitted to size the paper with arrowroot, or not used the solution of it thick enough to retain the image on its surface. The paper, too, is a little thin; try a thicker one. That and the sizing will probably get you over the difficulties, as the result sent is very promising. If the work is out of print, you may possibly obtain a copy by advertising for it.

YELLOW PRINTS.—A. G. writes: "I send enclosed two prints: No. 1 collodio-chloride paper, printed and enamelled two or three months ago, which has turned a distinctly yellow tinge; No. 2, which is still fairly good, printed and enamelled six or seven years ago, albumen print. Could you say what you think is the cause of No. I turning yellow so soon, as I have had quite a number of prints turn this way? I am anxious to find out the reason. It has been suggested to me that the backing paper is impure, or that perhaps a trace of alum, in which the prints are soaked before toning, acting on the gelatine, turns it in this way. The gelatine used is Coignet's enamelling gelatine, and does not usually go this way."—There may be one of two causes for the yellowing, or both of them combined. One may be that the alum was not completely washed out of the print before it was toned; the other, the use of an acid gelatine for the enamelling, or the two combined. Avoid the use of alum, which should not be necessary, and use a neutral gelatine, such as those supplied by the best English makers, and no trouble will be avoided.

*** Several answers to correspondents unavoidably held over.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

The thirty-seventh issue of The British Journal Photographic Almanac will be published on December 1 next. It is already in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the Almanac. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us lists of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the Almanac is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the Almanac are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Exactly a year ago we received several letters from professional photographers, who had been invited by Messrs. Charles Letts & Sons, the diarists, of 3, Royal Exchange, to allow their names and addresses to be included in a publication called the *British Almanac* as willing to take portraits free of charge, on presentation of a coupon placed in the book. The matter was fully ventilated in our columns for several weeks, and it was interesting to observe that no photographer wrote in support of this unusual method of doing business. When the *British Almanac* was published, we obtained a copy of it, and, though Messrs. Letts were quoted in our pages as averring that they were "literally inundated with applications from the very first photographers throughout Great Britain . . . . the only difficulty being to make a selection," only *fifty* photographers allowed their names to be printed as willing to take photographs for nothing. Rather a small "inundation," to be sure!

* * *

Messrs. Letts, however, appear to have been satisfied with the success of their scheme, for they are again circularising photographers in regard to the matter. Mr. Harold Baker, of Birmingham, forwards us the annexed letter, which he has received from Messrs. Letts:—

"We last year introduced into the *British Almanac* a scheme under which photographers in various parts of the country, agreed to take a single photograph *free of cost* on the supposition that, in nine cases out of ten, this would lead to an order for additional copies, and that it was, in fact, very little more than supplying the customary proof copy. The scheme was experimental, but proved so satisfactory that nearly all who then entered into the arrangement have agreed to continue it for 1898; but there are many towns unrepresented, and we

shall be glad to know if you would like to act for your district, and in that case would ask you to fill in and sign the enclosed form. Past experience has suggested certain modifications in the 'conditions,' mainly with a view to protect the photographer from an unfair use of the coupons. We ask no payment for the insertion of your name in the list, and for the consequent accession of business which such an advertisement in 100,000 copies of the book is sure to produce, but we do expect, in return for the benefits this confers, that there shall be a loyal carrying out of the offer made to our subscribers through the medium of the coupon."

* * *

Mr. Baker has been kind enough to show us his reply to the foregoing, and we append a copy of it:—

"I am in receipt of your letter inviting me to supply your customers with their photographs free of charge. Not being a public philanthropist, I don't quite see where I come in. I have heard from a friend of mine who tried the experiment, and he tells me he would not take it on again for 20*l.* down. I must confess that I fail to see what benefit your advertisement confers upon me in publishing the fact that I am prepared to give away my time and material to persons who purchase an almanac that is pushed by such transactions."

* * *

We have no doubt that, during the next few weeks, we shall receive many other letters relating to this matter. We are told of the case of a photographer who last year allowed his name to be published as willing to take photographs for nothing, and who found that the nuisance and the trouble it gave him were unbearable. At this one can feel neither pity nor surprise. But, as a rule, the good sense and business acumen of professional photographers doubtless render nugatory most schemes which place them in the position of avowing their willingness to do business for nothing

* * *

The new Honorary Secretary of the Camera Club, Mr. J. Wallace Godfrey, M.A., has entered upon the duties of his office with great energy, and has arranged an attractive programme of papers for October, particulars of which we append. These are all the signs of a successful future for the Club, the membership of which, we are given to understand, has recently very materially increased. The last number of the Club's journal is one of the most useful that we have looked through for some time, containing, as it does, several papers on artistic subjects for photography within a short distance of London. These articles are full of most interesting historical lore, and deserve to be studied. We have also received an impression of the supplement to the Club's journal for September. This consists of a photogravure reproduction, by Messrs. Annan, of a view of *Wivenhoe*, by Mr. George Davison. Similar supplements will in future be issued as a regular feature of the Club journal.

* * *

The following is the Camera Club programme for October:—

Monday, 4.—Smoking Concert, arranged by Mr. Rushton.
Thursday, 7.—Mr. J. H. Knight, "Two Years' Progress in Mechanical Traction."
Monday, 11.—Don de Ziloa Wichremasinghi* and M. Blumerius, "Notes on Certain Nationalities and Costumes in Russia."
Wednesday, 13.—Amateur Photographic Field Club, Exhibition of Lantern Slides. Ladies' Night.
Thursday, 14.—Professor Flinders Petrie, D.C.L., F.R.S., &c., "Photography the Handmaid of Exploration."
Friday, 15.—Trial of Lantern Slides in Studio.
Monday, 18.—Mr. Tom Bright, "Round about Windermere."
Thursday, 21.—Paper by Captain Abney.
Monday, 25.—County Slide Exhibition—Buckinghamshire.
Thursday, 28.—Paper by Sir Benjamin Stone, M.P., on "The National Photographic Record—Archæological Survey."
Exhibitions.—Session opens with an Exhibition of Photographs coloured in water colours, executed by M. Metreuter, of Moscow, illustrative of the Types and Costumes of the different Nationalities in Russia, and will be followed by an Exhibition of Photographs of Objects of Archæological Interest in the British Isles.

* Title not yet fixed.

OPTICAL INTENSIFICATION.

Lord Rayleigh has been good enough to send us a paper, which is published in the *Philosophical Magazine* for September, that describes an optical system, as distinct from the various chemical methods available, for obtaining intensified negatives, which is perhaps novel and may be found effective in practice. We reproduce the paper in full in another part of the Journal, and we here briefly recapitulate its salient features.

The method proposed by Lord Rayleigh was suggested to him by the fact that a thin collodion transparency, when backed up with a suitable surface of paper, reflects sufficient light to give the required amount of contrast in such a positive photograph. He therefore proposes to back up the negative in an analogous way and to obtain a positive from it by copying it in the camera, from which in turn a negative may, of course, be made.

The plan of working appears to be very simple. The source of light is a candle, placed alongside the copying lens, and the film side of the negative to be reproduced is brought into contact with a flat, polished reflector. A condenser of suitable focus parallelises the light from the candle, which, after reflection, again traverses the lens and forms an image of the candle centered upon the copying lens.

The author points out that false-reflected light from the optical surfaces employed may be avoided by sloping the condenser and placing a wedge-shaped glass in contact with the negative; he also deals with the method of securing adequate superposition of the negative and its image in the associated reflector. The diagram given in the paper will make clear to the reader the disposition of the optical system for this plan of reproducing a negative.

The communication of Lord Rayleigh will, doubtless, prove of interest to many of our readers. In the experience of many photographers there are frequently obtained negatives, particularly those that err on the side of incorrect exposure and that have been developed with modern reducing agents, with which density is not readily obtainable, and upon which it is practically impossible to build up the proper intensity by chemical means; in such cases as this it is possible that the plan put forth by Lord Rayleigh may prove of practical value.

The Large Sunspot.—Mr. G. F. Chambers says that the fine and symmetrical sunspot which has now been visible for a month seems likely to continue in existence for two or three months. The period of maximum display of sunspots as ordinarily reckoned is passed for three years or so, but solar activity continues, and as many and as large spots are seen now as at the epochs of so-called maximum display.

Astronomy and Photography.—Photography has again been helping astronomy. By its aid, in the Observatory at Nice, the astronomer, M. Charlois, has just discovered another new star. It is of the twelfth magnitude, and is in the constellation of Aquarius. It is recorded as "1897 Beta J." It will be interesting to know the number of new stars that have been discovered by the aid of photography.

In connexion with this subject it may be mentioned that the report of the Astronomer Royal has just been issued as a parliamentary paper. It is mentioned that the construction of the proposed balcony at Greenwich Observatory has now been sanctioned. This will give an all-round view of the sky from the building in which the twenty-eight-inch telescope is mounted. If we mistake not, this is the instrument that was lately supplied by Sir Howard Grubb, F.R.S., and is specially adapted for photographic purposes.

Some difficulty has been experienced at Greenwich in finding a suitable site for the magnetic pavilion. One has at last, however, been found in the park, which is said to be in every way fitted for the work. It is situated some three or four hundred yards east of the Observatory. All the magnetic records are made automatically by photography at Greenwich, the same as they are at the Kew Observatory. This, however, is no new application of photography. Last week we mentioned that magnetograph and barograph records on Daguerreotype plates, made in Kew in 1849, were to be seen amongst the historical photographs at the Crystal Palace. The present records there are made on bromide paper, we believe.

Crookes' Tubes with Tinfoil.—A writer in the *English Mechanic* confirms the great value of the method of putting a coating of tinfoil round the cathode end of the tube. The breadth of the foil, he added, was about two inches on a tube made for a ten-inch spark, and it so greatly increased the sensitiveness of the tube that practically any length of spark would excite it. Another tube that would only work with a sixteen-inch spark, and then only after raising the temperature of the tube to a considerable extent, became so altered that it was freely excited when merely held at or near the terminals of a small influence machine; almost a toy machine would answer.

Reversed Negatives.—It is not a little surprising that the method of making reversed negatives that was introduced a dozen or more years ago by Mr. Thomas Bolas is not more used than it is by those who require them for the mechanical and other processes. Mr. Banks described it at a recent meeting of the London and Provincial. The process is simplicity itself, and has the advantage of economy, inasmuch as any old, stale, or light-struck, plates may be utilised for the work. All that is necessary is to immerse the plates in a weak solution of bichromate of potash, dry, and expose under the negative to be reproduced till a strong image can be seen at the back. The plate is then well washed to get rid of the bichromate, and exposed to light. It is then developed with the ordinary developer. Although the method is so simple, the results are all that can be desired; yet the process seems to be overlooked.

Recovery of Burnt Bank Notes by Photography.—Our contemporary, *La Nature*, has an amusing article by Professor Amann, of the University of Lausanne, describing how he was able to produce photographs of a number of bank notes that a thrifty peasant woman had saved and kept in a tin box in a hiding place formed by a stove, which, in her absence one day, her son lighted, and so burnt the notes. The photographic result is shown by the unusual (for *La Nature*) means of a process block. The mass of notes so strongly resembled a fossil of the coal period that even "the old cashier of the house could not recognise in it the greasy bits of paper covered with microbes that he was accustomed to handle," and the Professor was charged with the task of getting the best proof he could from this involuntary *auto de fé*. In collaboration with a skilful photographer, he was, after infinite difficulty in separating the charred fragments, able to get sufficient results to enable the bankers to feel justified in paying, as they did, the whole sum of five hundred and fifty francs.

Another Fire at South Kensington.—On Tuesday, last week, the South Kensington Museum had another escape from what might have been a serious fire, arising from a piece of ignited carbon falling from one of the arc lamps in the Science Library. Fortunately there were several readers present at the time, and the fire was quickly extinguished. The *Westminster Gazette* says: "From inquiries made in other parts of the building it seems that this fall of carbon from the electric lamps is not so rare as the Museum authorities would like to represent." It adds, "There is surely no question that immediate steps should be taken to prevent the possibility of any such accident as occurred on Tuesday night." All, we opine, will acquiesce in the sentiments of our contemporary. But, there, we all know the powers that be at South Kensington move slowly. Possibly, however, some steps will in time be taken to avert a catastrophe, and a serious fire at the Museum would be really little short of a national one.

Pigeon Post.—During the siege of Paris the great use that was made of the pigeon post will be remembered, indeed it was for a long spell the only means of communication with the outer world. The messages were photographed microscopically, enclosed in quills, and dispatched and received by carrier pigeons. Last year a decree was issued, prohibiting foreigners from rearing carrier pigeons without the special permit of the Minister of the Interior; but, in spite of that, the authorities have found that a large number of foreigners, unknown to them, still continue to do so. The Minister of War regards this as a danger to the safety of the nation, and therefore demands of the Minister the prohibition of foreigners rearing carrier pigeons in the frontier departments. The latter has now decided to reject all new applications for the permission in the future, made from foreigners, in the several departments which are specified. The pigeon post would be next to an impossibility without photography.

Röntgen Rays and the Press.—It is true that the New Photography with these rays was first made known to the public in this country by a daily paper, but that we must not therefore believe all on the subject we read in the papers is evident after perusing a late Dalziel telegram. This is to the effect that a physician in Baltimore has made a "wonderful discovery" in connexion with the X rays. He is reported to have discovered that an ordinary photograph may disclose the internal organs when subjected to the action of the Röntgen rays, just the same as when they are applied to the actual body. It is therefore suggested that in future it will not be necessary to appear before a physician to obtain advice; all that is required will be a photograph, from which the medical man will be able to diagnose the case with the aid of the Röntgen rays. We are not informed whether the same treatment will enable the doctor to ascertain whether his patient has enough money in his pocket to pay his fee, nor even whether his *fiancée* would be able to read the contents of any letters in his pockets if she were of a jealous disposition, an omission which the Dalziel reporter would do well to supply.

Modern Alchemy.—Referring to the comments of a rather ungenerous nature made upon Dr. Emmens' argentaurum process—the manufacture of a metal with gold appearance and reaction—this gentleman writes to the *Chemical News* with extracts of letters showing the groundless nature of the complaints against him. He further says: "I will conclude with a narration of what may, perhaps, be deemed an interesting historical fact. On March 16, 1897, I sent to the United States Assay Office, in New York, a Mexican dollar to be tested for gold. The report was *nil*. Think-

ing that this might have been an accidental case of individual purity, I then sent four Mexican dollars to the same Assay Office, and had them there cut into halves. One set of halves was officially assayed with the same *nil* result as before. The other set was treated in the argentaurum laboratory without the addition of gold in any form, and the result was a relatively considerable production of a metal which answered to all the usual tests of gold, *and was subsequently purchased as gold by the United States Assay Office.*" A footnote to the letter (signed "W. C.") is as follows: "A specimen of argentaurum sent me by Dr. Emmens has been examined in the spectrograph. It consists of gold with a fair proportion of silver and a little copper, no lines belonging to any other known element, and no unknown lines were detected." This is all so very extraordinary that we wait with some impatience further developments.

Weather Forecasting.—Those who took their photographic holidays during August need not be reminded of the weather during that month. Had they have been cognisant of what it was to be, they would have deferred the outing till later on, or perhaps left their cameras at home. In a letter to the *Standard* one day last week Mr. Hugh Clements, who makes forecasts of the weather a long time ahead with claims to accuracy, says that on July 17 he "issued a prediction of the weather from August 1 to December 31, giving the barometer curves, as well as the rainfall for London." He says that he predicted the first week of August fine, and so it was. After that, he forecasted there would be but few days without rain; there, again, he was *not* wrong. The forecast is to the effect that, after August 8, until the third week in October, we are to have unsettled weather, with frequent rain. This is not a bright outlook if reliance is to be placed on the predictions.

It will be remembered that a few weeks back we alluded to the fact that Dr. Zeuger, of the Prague Technical University, had been highly congratulated at the Academy of Sciences of Paris, by the meteorologists, on the correctness of his forecasts of the weather, which were issued before those of Mr. Clements. There is plenty of time before the end of the year to verify the correctness or otherwise of the latter's predictions, as well as those of Mr. Clements.

On the same day that Mr. Clements' letter to the *Standard* appeared, there was an amusing account in the *Sun* of its representative's interview, at the Meteorological Office, with the "chief weather manufacturer," who declined to make any venture on prophecy. It appears that, according to official and scientific theory, the weather cannot be satisfactorily predicted for more than twenty-four hours in advance; yet we know that we used to have forecasts sent to us from America some days beforehand as to the weather we were to have, and they were generally correct. How far our forecasts, issued daily from our Meteorological Office, are reliable for only the twenty-four hours, all are aware. A cynical friend recently remarked to us that, if a part of the fifteen or twenty thousand pounds annually voted to that department were expended amongst seaside boatmen, farmers, and the like, we should probably get better value for our money, in the way of forecasting, than we now do from Westminster, although it may not be *scientifically* done.

By the way, Paris has not been behind us here in the matter of rainfall. It appears that the amount of rain that fell during the month of August, registered at the Paris Observatory, has only eight times been exceeded since 1690.

ON AN OPTICAL DEVICE FOR THE INTENSIFICATION OF PHOTOGRAPHIC PICTURES.

[From the Philosophical Magazine for September, 1897.]

Whether from insufficient exposure or from other causes, it not unfrequently happens that a photographic negative is deficient in density, the ratio of light transmissions for the transparent and opaque parts being too low for effective contrast. In many cases an adequate remedy is found in chemical processes of intensification, but modern gelatine plates do not always lend themselves well to this treatment.

The method now proposed may be described as one of using the negative twice over. Many years ago a pleasing style of portrait was current dependent upon a similar principle. A thin positive transparency is developed upon a collodion plate by acid pyrogallol. Viewed in the ordinary way by holding up to the light, the picture is altogether too faint; but, when the film side is placed in contact with paper and the combination viewed by reflected light, the contrast is sufficient. Through the transparent parts the paper is seen with but little loss of brilliancy, while the opaque parts act, as it were, twice over, once before the light reaches the paper, and again after reflection on its way to the eye. For this purpose it is necessary that the deposit, constituting the more opaque parts of the picture, be of such a nature as not itself to reflect light back to the eye in appreciable degree—a condition very far from being satisfied by ordinary gelatine negatives. But, by a modification of the process, the objection may be met without much difficulty.

To obtain an intensified copy (positive) of a feeble negative, a small source of illumination, *e.g.*, a candle, is employed, and it is placed just alongside of the copying lens. The white paper is replaced by a flat polished reflector, and the film side of the negative is brought into close contact with it. On the other side of the negative and pretty close to it is a field, or condensing, lens of such power that the light from the candle is made parallel by it. After reflection, the light again traverses the lens and forms an image of the candle centered upon the photographic copying lens. The condenser must be large enough to include the picture, and must be free from dirt and scratches; otherwise it does not need to be of good optical quality. If the positive is to preserve the original scale, the focal length of the condenser must be about twice that of the copying lens.

In carrying this method into execution there are two points which require special attention. The first is the elimination of false light reflected from the optical surfaces employed. As regards the condensing lens, the difficulty is easily met by giving it a moderate slope. But the light reflected from the glass face of the negative to be copied is less easily dealt with. If allowed to remain, it gives a uniform illumination over the whole field, which, in many cases, would go far to neutralise the advantages otherwise obtainable by the method. The difficulty arises from the parallelism of the two surfaces of the negative, and is obviated by using for the support of the film a glass whose faces are inclined. The false light can then be thrown to one side and rendered inoperative. In practice it suffices to bring into contact with the negative (taken as usual upon a parallel plate) a wedge-shaped glass of equal or greater area, the reflection from the adjoining faces being almost destroyed by the interposition of a layer of turpentine. By these devices the false light is practically eliminated, and none reaches the sensitive film but what has twice traversed the original negative.

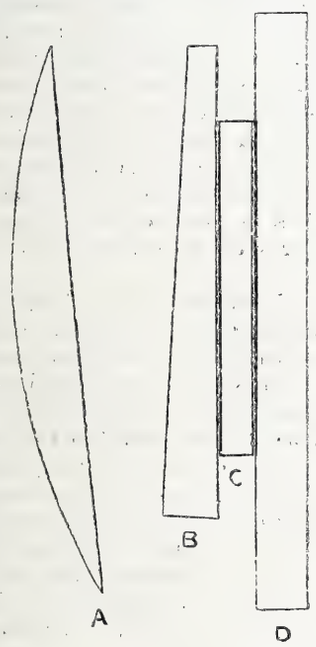
The other point requiring attention is to secure adequate superposition of the negative and its image in the associated reflector. On account of the slight lateral interval between the copying lens and the source of light, the incidence of the rays upon the reflector is not accurately perpendicular, and thus any imperfection of contact between the negative film and the reflector leads to a displacement prejudicial to definition. The linear displacement is evidently $2t \sin\theta$, if t denote the interval between the surfaces and θ the angle of incidence, and it can be calculated in any particular case. It is the necessity for a small t that imposes the use of a speculum as a reflector. In practice 2θ can easily be reduced to $\frac{1}{12}$; so that, if t were $\frac{1}{50}$ inch, the displacement would not exceed $\frac{1}{6000}$ inch, and for most purposes might be disregarded.* The obliquity θ could be got rid of altogether by introducing the light with the aid of a parallel glass reflector placed at 45°; but this complication is hardly to be recommended.

The scale of the apparatus depends, of course, upon the size of the negatives to be copied. In my own experiments quarter-plates

* If the glass of the negative were flat, its approximation to the reflector might be much closer than is here supposed.

$\frac{1}{4} \times 3\frac{1}{4}$ inches) were employed. The condenser is of plate glass, 6 ches diameter and 36 inches focus. The reflector is of silver posited on glass.* The wedge-shaped glass† attached to the nega- e with turpentine is 4×4 inches, and the angle between the es is 2°. The photographic lens is of 3-inch aperture and about -inch principal focus. It stands at about 36 inches from the gative to be copied.

The accompanying sketch shows the disposition of some of the rts.. It represents a section by a horizontal plane. A is the con-



lensing lens, B the wedge, C the negative temporarily cemented to by fluid turpentine, D, the speculum.

LORD RAYLEIGH, F.R.S.

BY THE WAY.

MESSRS. HADDON and GRUNDY'S Convention paper appears to have started another of the periodical agitations in favour of albumen paper, but whether anything more is likely to come of it than on previous occasions is more than doubtful; for, as far back nearly as I can remember, it has been the fashion at intervals to inveigh strongly against the instability of albumen prints, and to sigh for something—anything, in fact, that would supersede it. It did not matter what the process was if it would only give albumen *results*; it was bound, in popular fancy, to be more permanent.

Well, we have had, in turn, the carbon process, collodio-chloride, platinotype, and a variety of other processes of minor importance, but not one of these can be said to have in the slightest degree threatened to displace albumen. It is quite true that carbon and platinum, at least, have secured more than a firm foot-hold, but their adoption has remained in comparatively few hands, chiefly the better classes of both amateur and professional; but, until gelatino-chloride came up, nothing has ever succeeded in attaining such a hold on general popularity. The reason of this or the reasons are not far to seek. It is capable of giving fine results, with a minimum of trouble, from indifferent negatives, and this is just precisely what everybody, especially the average amateur, wants. I do not think anybody has yet claimed that gelatino-chloride will give better results than albumen in good hands; my own opinion is that it would fall short of it. But, then, the albumen will require the care and skill that were more common a few years ago now, and a different type of negative, that was also more common in the days of collodion.

* For a systematic use of the method a reflector of speculum metal would probably be preferable.

† It is one of those employed for a similar purpose in the projection of Newton's rings (*Proc. Roy. Inst.*, March, 1893; *Nature*, vol. xlviii. p. 212).

It would be wrong, perhaps, to say a *better* type or class of negative, because the negative is but a means to an end, and whatever type of negative produces the best results with any given printing method is "the best" for that method. Gelatine papers came into use at a time when, for one thing, the working of gelatine plates was not so well understood as at present, nor were the plates themselves as perfect, in addition to which there were a vast number of new recruits in the ranks of photography, who, if they knew what a "good" negative meant, were incapable of producing it. What wonder, then, if this army, finding that gelatino-chloride would give brilliant prints from comparatively poor negatives when albumen would not, hailed it with delight. What wonder, too, if professionals, finding that for similar reasons it relieved them of a certain amount of trouble, should follow suit and adopt the new process.

On what ground the claim for greater permanency is based it would be difficult to say, unless it be the very simple one that gelatine is *not* albumen, and therefore the new process *must* be more permanent. This was, in fact, practically the argument adopted by some early makers, who, by this kind of teaching and a persistence in recommending the "combined" toning and fixing bath, and alum and other "atrocities," have done much to originate, as well as perpetuate, the doubtful character that is growing in connexion with gelatine papers. With some kinds of paper the combined bath is the only one that will tone at all, and with others the only one that will tone decently, so that there is every reason to continue its use under those circumstances; but to claim at the same time increased or absolute permanency is a course that does not appear to have any obvious justification.

Let us see what are the facts of the case. The whole indictment against albumen paper is that prints produced by its means sometimes fade within a very short period, while at others they remain unchanged. The change or fading that takes place consists undoubtedly in the formation of sulphur compounds of silver in the print, and albumen, being itself a "sulphur compound," is at once condemned as the inevitable cause. Does not the matutinal egg blacken your silver spoon if you are fortunate enough to have one? Then, does it not necessarily follow that the glossy surface of your albumen print must ultimately discolour the silver image? It is an "irresistible" argument, and, although innumerable instances can be brought to support it, there are a few photographs in existence that entirely disprove the idea that albumen prints are *necessarily* prone to fade.

If we turn to gelatine as a substitute for albumen as the vehicle for the sensitive salt, what difference do we find to justify the claim to greater permanency? Gelatine is also a sulphur compound, though to a less degree than albumen—if this has anything at all to do with the matter, which I doubt. It is employed in connexion with precisely the same chemicals as are used with albumen, though the processes through which it passes before it arrives at the condition of a sensitive film are altogether different, and certainly not in favour of greater permanence. But, when we come to examine the physical characters of the albumen and gelatine films respectively, one is inclined to wonder whether it is allowable to claim for gelatine a superior degree of permanence.

The truth probably is that, while neither process is perfect; either will give practically permanent results under proper conditions of treatment, the question remaining as to which requires the greatest care in order to secure the necessary conditions. So far as the actual chemical conditions affect the two materials, I think it has been conclusively proved that deterioration of prints is not due, or at most in an infinitesimal degree, to any necessary action or combination between the silver salt and the albumen or gelatine. It has been shown that a certain small quantity of silver remains permanently in combination with the substance of the film, but this is insufficient to cause any appreciable trouble and applies equally to both, so that it may be totally disregarded. What we have especially to deal with is the physical character of the two films and the manner in which this may operate in affecting the permanency of results.

Taking the albumen film first, we have, after sensitising, a thin, insoluble, firm, hard and more or less porous film, capable of withstanding a considerable amount of rough usage, comparatively little liable to putrefactive decomposition, and unaffected by change of temperature. On the other hand, in the case of gelatine, we have a thick, soft, and very absorptive film, perfectly soluble in warm water, extremely tender while in the moist condition, and strongly inclined to putrefactive decomposition. This is not a promising contrast whether regarded from a chemical or a merely physical point of view; but the former we need not stay to consider, it will quite suffice to look at the mechanical side.

Suppose an albumen and a gelatine print to come out of the fixing bath side by side, which is the more likely to be most rapidly freed from the soluble and deleterious salts it contains with the least amount of trouble and the smallest chance of injury? I have not the faintest hesitation in saying at once the albumen. It has been an old fallacy that albumen prints require prolonged soaking to free them from hypo; another fallacy, that hypo is difficult to remove by reason of its slow diffusion. Mr. Haddon's recent experiments have exploded the former as well as the latter, and he has shown that, given perfect or sufficient fixation, the removal of the soluble matter can be very rapidly effected. This being the case, which is the more likely to be most rapidly freed from soluble matter, the thin film of albumen or the much thicker one of gelatine? Which, again, affords the most favourable opportunities for mechanical methods of treatment without danger of injury?

While I admit that either process will give permanent results under proper treatment, I think it is beyond doubt that gelatine affords by far the larger number of opportunities for carelessness, and also presents much greater difficulties than does albumen. I consider some manufacturers of the paper are, or have been, much to blame in recommending combined baths and the use of alum without sufficiently emphasising the dangers that surround both, for it is chiefly on their use that the general bad character of gelatine paper is founded.

DOGBERRY.

MULTIPLE STOPS IN HALF-TONE PROCESS WORK.

II.

FROM what has been already said it is evident that the shadow stop or, rather, its apertures, must bear a definite relation to those of the larger stop used for "joining up." It is not sufficient, as in ordinary work with a single aperture, to employ a certain-sized square opening for joining up, and then finish off the shadows with any-sized smaller aperture. In the latter case there is only the matter of size of aperture to be considered, and, provided the shadow stop be smaller than the other, it is a matter of comparatively little moment, except so far as it affects the exposures, what the actual size may be. Not so, however, with the multiple openings, for the most important factor in that case is to preserve the same distance between the centres of the apertures in both stops. After that, the question of size is immaterial.

Thus it might be supposed that, having made the main exposure with the larger stop, another one, crowded with as many minute apertures as it would carry, would answer the purpose of the shadow dot, provided the perforations were equidistant; that, in fact, a piece of perforated zinc inserted in the diaphragm slit would do all that was necessary. If the experiment be tried, however, it will, in ninety-nine cases out of a hundred, prove abortive, for the reason given, though, in the hundredth, the conditions might by accident prove favourable to success. Such a stop, if tried independently of any given screen distance, or of any other stop, would, no doubt, prove a practicable one, provided, on the one hand, the total area covered by the apertures was not too large, or, on the other, the size of the individual perforations not too small, to place its working distance beyond the capacity of the screen-holder. In other words, there would, in all probability, be found a position of the screen in which even a piece of ordinary perforated zinc would give a definite and workable dot.

But, if it were tried in conjunction with the four or five-apertu diaphragm described in my previous article, that is to say, inserte in place of the latter at its proper screen distance, the chances woul be very much indeed against its giving a dot of any kind; or, if did, it would represent a much finer ruling than the actual scree owing to the interposition of additional dots between the scree openings.

It need not be imagined that the plotting out of a series o multiple aperture stops is a difficult matter, for it is in reality th simplest thing in the world, and only requires a pair of compasses o dividers, and some thin cardboard or metal; but, if a lathe be avai able for drilling, so much the better. What we have to bear in min is, that the centres of the individual apertures must stand in th same relation to one another as the centres of the screen openings and, in the case of a screen in which the lines have the same thick ness as the clear spaces, this means a pattern of squares of equ size, like a chessboard, when the openings are at their larges or, when smaller, of a series of circles, squares, or other shape openings, whose centres correspond with those of the chessboar squares.

In his paper to which I have already referred, Mr. Deville figure a "five-aperture" diaphragm such as I have described but for us "with the chessboard screen only," and goes on to say that "the rul for the cross-line screen is that there must be one pair or severa pairs of apertures; the line joining the centres of the components o any one pair must be inclined at 45° to the lines of the screen. While this rule is perfectly correct as far as it goes, I would poin out, as a very little consideration will prove, that the conditions ar absolutely fulfilled (for a cross-line screen with equal lines and space at any rate) by inscribing the apertures in the alternate squares of chessboard as I have directed, but which Mr. Deville states is for us with the chessboard screen only. Such a cross-line screen with th lines running diagonally is, in fact, a chessboard screen to a intents and purposes.

Obviously the working of this system of multiple openings i limited within comparatively narrow bounds by the exigencies of len construction, at any rate so far as the large stop is concerned. Fo instance, with a rapid rectilinear lens of eight inches focus and maximum working aperture of *f*-8, I find that the largest "five aperture" stop I can use is one in which the individual squares ar a trifle under a quarter of an inch in diameter; the largest squar that can be cut out of, or inscribed in, a one-inch circle is one whos side measures approximately eleven-sixteenths of an inch, and th diaphragm I mention represents that square divided into nin component parts, five of which are utilised.

If the utility of the multiple diaphragm were confined to th large stop, there would perhaps be very little to be gained by its us since, in point of rapidity of working, it would be about equalled b a single aperture of half an inch in diameter, which would at th same time join up the dots more effectively, though not to th extent that might be supposed from a comparison between th different-sized squares. Although in the multiple stop the individua openings are less than half the diameter of the single one of simila working rapidity, their disposition at the centre and corners of still larger square gives the multiple stop an advantage in the matte of "joining up" that it would not possess by virtue of the amoun of light it passes alone; in fact, although I am not certain on th point, I am not sure that the stop I am describing does not join up quite as well as a single half-inch.

It is, however, when we turn to the small or shadow stop that the advantage of the multiple system becomes apparent, for it enables us to use a much smaller aperture, and thus secure fineness and sharpness of dot without so great an extension of exposure as would otherwise be the case. In the case of the large stop, the balance of exposure is in favour of the single aperture, using the lens to its fullest capacity; but it is quite different with the shadow stop, for here, with a given size of stop, we have a direct gain in exposure proportionate to the number of apertures employed, or, with a four-aperture stop, we can combine the sharpness and size of dot of a given aperture with the curtailment of exposure of one double its diameter.

With the five-aperture stop already referred to I have obtained very good results with shadow stops composed of circular apertures one-sixteenth and one-twentieth of an inch, using the lens at a camera extension of eighteen inches, or a slight enlargement of the original. At first I used three apertures, as in the larger stop, the openings being simultaneously drilled in the lathe through several pieces of metal at once to secure uniformity, and afterwards enlarged to whatever dimensions required. But, later, I found that, without in the least degree interfering with the working of the stop, I could increase the number of working apertures to nine within the capacity of the full aperture of the lens. This was done in the following way: The five-aperture stop has its openings placed in the form of the multiplication sign, ×. If we rule for lines parallel with the lines of the cross and through the corner dots or apertures, and drill four more holes at the corners of the square thus formed, we have a stop of nearly double the power, and still conforming to the required conditions.

A few words may be said on the method of using these stops. The focussing and screen adjustments are done with the larger stop simply from convenience, though it matters not which is used by the method known as "focussing the screen." Using the large stops, the screen is adjusted to the distance at which a fairly sharp *black* dot is given with wide, clear surrounding space. If the small stop be now substituted and the image examined, it will be found to present the appearance in the lights of round, or nearly so, *transparent* dots, and, in the shadows, intensely bright specks of light shining out from a mass of black. The intense brightness of the dots thus formed is the principal feature of the method, and it is on this that its success depends, for, with the aperture at one-twentieth of an inch, a *stronger impression of the shadow dots is made upon the plate in a given time than when the joining-up stop is used*, or, to make a more definite statement, the small stop will impress the shadow dots on the plate in absolutely less time than the larger one, in spite of the difference in their respective areas. The effect is due, I suppose, to diffraction, from the use of the small aperture.

The result of using so small an aperture as the one-sixteenth or one-twentieth of an inch is rather curious. With the larger multiple stop, as I have already said, the closing up of the dot is as well effected as by means of a much larger single stop. I tried the experiment of considerably prolonging the exposure with the nine-aperture one-twentieth stop in order to see if the dots would close up; but, in development, scarcely the sign of an image, except in the very highest lights, was obtained, but, after a while, apparently general fog. After fixing and examining with a magnifier, the visible image was found to consist of a perfect chessboard pattern of the highest lights, while the "fog" resolved itself into a perfect image of the rest of the picture in intensely black and sharp, but extremely minute, points.

So far as I have used these stops, it is merely in an experimental way, but I am convinced there is "something in it." I have had no experience with wet plates, but with both collodion and gelatine dry plates I can get a nearer approach to what I consider an "ideal" half-tone negative than I have ever done with single apertures. It is possible that what I have written may be far from new, though it is new to me. If it is new, I shall be glad if some of our practical "process" workers will try the method. W. B. Bolton.

FRAMING AND MOUNTING EXHIBITION PHOTOGRAPHS: WHAT THE LEADING EXHIBITORS AFFECT.

I.

Some general principles bearing upon the mounting and framing of photographs have elsewhere been dealt with by me. On the present occasion it is proposed to afford more particular information, and definite criticism, respecting the fashions in framing which for the moment are paramount in our leading exhibitions.

Such information as follows cannot, I think, but be of considerable service to the many, especially those living in outlying districts, who lack both experience and originality. At the same time it is to be remembered that one must always beware of slavishly following the lead of even the most distinguished of exhibitors; not only because some of these have before now been guilty of framing their works in the worst possible taste, and with deplorable result, but because, as elsewhere explained, every photograph should receive special treatment according to its particular needs.

Although a good deal of the present fashion in framing is the outcome of reaction and caprice, it must not be forgotten that changes in the modes of surround are amongst the inevitable consequences of changes in printing methods, in focussing practices, and the like.

Thus, now that, for the moment at any rate, the ultra-sharp landscapes have been superseded by the *splendide mendax* series of smudgy scenery to which we have all grown more or less resigned, it stands to reason that a frame which was quite suitable to the fine detail of the former needs to be vastly different in line, mass, colour, and surface, in order to come well as a setting for the present photographic manner. Thus, not even the dullest-witted would dream of employing similar mounts and frames for, say, Gale's *Sleepy Hollow* and Craig Annan's *Eleanore*.

A Bygone Fashion in Frames.

It will here, perhaps, be interesting, and certainly instructive, to glance back for a moment at a bygone era. Some few years since, in 1890, I contributed to a contemporary certain descriptive notes respecting the framing of the medalled and other notable exhibits at the Photographic Society's Pall Mall Exhibition: of these I append a brief summary, which may be advantageously compared with similar notes made at exhibitions during the current twelve months.

It will be noticed that in 1890 the medalled works, at the above-named Exhibition were mainly displayed on white or light-tinted mounts, and were framed in common "shop" mouldings of "natural" oak, and occasionally of walnut. Amongst those noted were the following:—

Lydell Sawyer, *Two's Company;* sepia print; mounted on grey and white; framed oak moulding, with gilt slip.

J. B. B. Wellington, *Summer Evening;* warm-toned print; mounted on white and grey-buff; framed black and gold.

Bhedwar, *Feast of Roses;* warm platinotype; framed walnut and gold.

Lyonel Clark, *Dedham Bridge;* warm sepia (palladium-toned silver print); mounted on Naples yellow and white.

J. E. Austin, *The Love Letter;* platinotype black, mounted on pale grey; framed black and gold.

B. Gay Wilkinson, *Sand Dunes;* sepia; mounted in buff and white; framed in oak moulding.

Van der Weyde, *Jap Scandal;* warm toned; framed close with stained oak, decorated in gold with a Japanesque design.

G. Davison, *An Old Farmstead;* warm-toned platinotype; framed close, print being recessed in heavy gilt moulding.

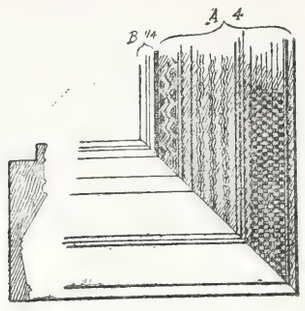
From the above it will be gathered that the fashion, now so prevalent at the Salon and elsewhere, of employing dark-coloured broad frames was in 1890 practically unknown. As previously said, natural oak mouldings and imitation-plate-marked mounts were the rage, sham and shoddy being quite complacently used by the very best of the exhibitors. Of the two photographs in the foregoing list described as being framed close, one (Mr. Van der Weyde's) was an unusually large, decoratively treated work, which could hardly have been by any possibility differently dealt with. Mr. Davison's picture was one of the pioneer photographs which inculcated the advantages of dispensing with a mount. At the same time there are some who would now regard the frame then employed by Mr. Davison as a "shocking" example of the ostentatious adoption of too much garish gold, in place of those restful browns, olive-grey-greens, russet-blacks, and the like, which at present are so much in evidence.

The Mode at the Royal Photographic Society in 1896.

Coming in more detail to the schemes of framing now favoured, I append some rough sketches of the chief notable examples of surrounds which were displayed at the Royal Photographic Society's Exhibition and at the Salon. In doing which I shall make such passing explanatory and critical comments upon the arrangements adopted as seem called for.

Beginning with the Royal Photographic Society's Exhibition, following the catalogue order, and taking note of the medalled exhibits, first comes *A Study*, by Phillip von Schoeler.

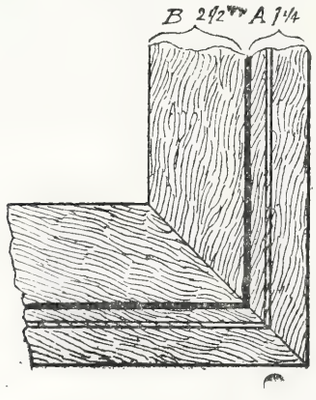
This print was of a warm black tone measuring $7\frac{1}{4} \times 5\frac{1}{2}$, next to it came a gold slip, measuring a quarter of an inch; the frame proper was of dark black-brown oak, which was seemingly coloured by age, and riddled with worm-eaten holes; it was rather elaborately ornamented by a conventional design, which is partly suggested, rather than reproduced, in the accompanying sketch. The frame was a particularly impressive one, and certainly lent an air of distinction, and gave a sympathetic suggestion,



to the subject which it would not have received from an obviously new machine-made German moulding.

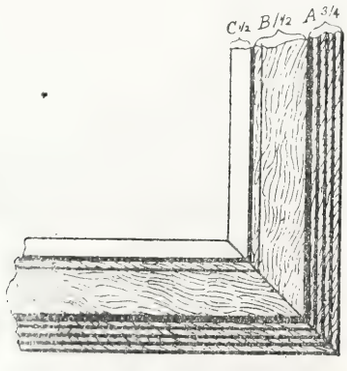
The optical effect of the above was to give some appearance of light to parts of the half-shadows which were inclined to be over-dark; on the other hand, the values of the delicate half-high lights in the girl's ruff were almost utterly ruined.

Trau Cathedral, Dalmatia, by Mr. John Busby. Print, warm black; carbon, slightly warmer in tone than the foregoing, $16\frac{1}{2} \times 13\frac{1}{2}$; framed



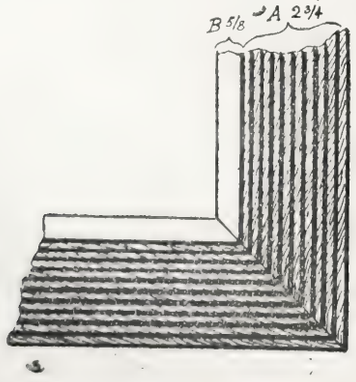
close up in oak moulding three and a half inches wide, stained to a dark slate green.

Norwich, The North Choir Aisle, by J. Bulbeck & Co. Print, grey platinum, 14×10; surround, half an inch receding gilt flat, enclosed by



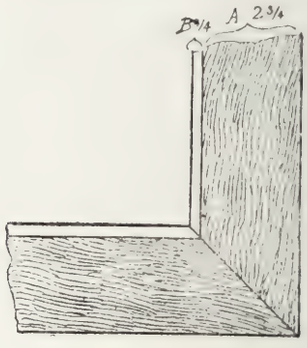
brown oak moulding, apparently polished with oil.

Ebb of a Winter's Day, by Mr. W. Thomas, $7\frac{1}{2} \times 4\frac{1}{2}$, cold grey platinum, lacking full intensity of shadow; surround, five-eighths of an inch silver slip, enclosed in a boldly reeded oak flat, painted a strong shiny black,



the effect of which was to set up a stronger contrast (silver and black) i the frame than was anywhere to be found in the print; moreover, th aggressively deep black of the moulding entirely murdered the debilitate shadows of the print.

A Decorated Panel, by Mr. Alfred Stieglitz, $14\frac{1}{2} \times 9$. This, an en largement of a snap-shot, was sepia in tone and none too vigorous i chiaroscuro; it had no pure white in its highest light. The frame was plain oak (or similar wood), stained of Vandyke-like hue, with a quarte



inch bevelled edge of gilt to separate the brown moulding from the brow print. In the above Mr. Stieglitz has aimed at a harmony, and ha endeavoured to counteract some slight discord which would ensue wer there an absolute juxtaposition of the two not quite identical browns b the interposition of the gilt slip aforesaid.

HECTOR MACLEAN, F.R.P.S.

TESTING PRINTS FOR HYPO.

[Photographic Scraps.]

EVERY ONE has felt at some time or other the need of a rapid method o testing prints during washing in order to find out if all the hypo ha been removed, and probably, on looking up the subject in his text-book has seen it stated that a weak solution of permanganate of potash or o iodide of starch, if painted on the back of a print, would lose its colour i any hypo were present.

This is, of course, perfectly correct, but it unfortunately happens tha hypo is *not* the only substance that will discharge the colour of permanga nate of potash or iodide of starch; permanganate of potash is particularly subject to decolouration by many other substances.

How easy it is to fall into error with regard to the permanganate test is shown by a communication we have recently seen to the Britanni Works Company, in which it is stated that prints on P.O.P. which hav been fixed and washed before toning would not give satisfactory result in the toning bath.

In order to discover the cause, the baths and washing water from th prints were tested for hypo, but none was found; however, on testin the prints as they came from the washer by painting on an alkalin solution of permanganate of potash, it was at once turned green and afterwards brown, showing apparently the presence of hypo.

Prints were then placed in a large washer, passing ten gallons of water per hour, and prints withdrawn at the end of 2, 4, 6, 8, and 12 hours, and, on being tested with alkaline permanganate of potash, hypo appeared to be present.

When one comes to examine more closely the method of testing, it will be found, under the circumstances detailed above, to be utterly unreliable, as the following experiments will show.

A solution of permanganate of potash was prepared, and made alkaline by the addition of a little caustic potash, and this solution was painted on a piece of very pure ash-free filter paper. This paper was free from everything except a trace of silica. The pink colour of the permanganate was at once changed to a green, passing into brown, and, on repeating this test with the same paper, but now dipped into a weak solution of hypo, exactly the same change took place.

As an acid solution of permanganate is usually recommended, a solution of this salt was prepared containing a small quantity of sulphuric acid, and the test repeated with it. In this case the pink colour changed, but more slowly than with the alkaline permanganate, and there was a considerable difference in the time required to alter the colour in the case of the pure paper and the paper containing hypo, the latter being the more rapid.

Another test that was made was to pulp three quarter-plate prints by boiling with water and filtering off the liquid; this also, on testing, showed apparent presence of hypo. Here another source of error comes into play. As every one knows, on boiling gelatine prints in water, a

large quantity, if not all, the gelatine would go into solution, and, on experimenting with a solution of pure gelatine, we found both alkaline and acid permanganate were decoloured.

Another test, given by Fresenius, is that a dilute solution of chromic acid is changed from yellow to green by hypo, but this also is brought about by the action of other bodies besides hypo; for instance, a hot solution of gelatine turns the yellow colour green in a short time.

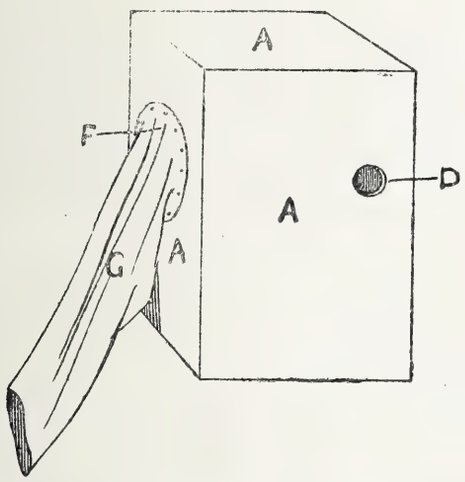
There still remains to be discussed the iodide of starch test, and this under the circumstances of testing as detailed, *i.e.*, painting the coloured solution on the back of the print, is probably the most reliable. If a weak solution of iodide of starch is painted with a glass rod on the back of a piece of pure paper, it gives a blue stain; but, if a small quantity of hypo still remains in the pores of the paper, the colour is discharged. Even this test is not quite certain, neither the paper nor the gelatine alters the colour; but traces of alkali, such as soda or ammonia in the presence of nitrites, which often occur in water and many other substances, discharge the blue colour.

In fact, by far the best test of the freedom of the prints from hypo is the knowledge that they have been kept in constant movement and prevented from sticking together either in a good washer or by hand with constant change of water; one hour's washing, with attention to each print, is far better than twenty-four hours' soaking in a mass, even if the water be running.

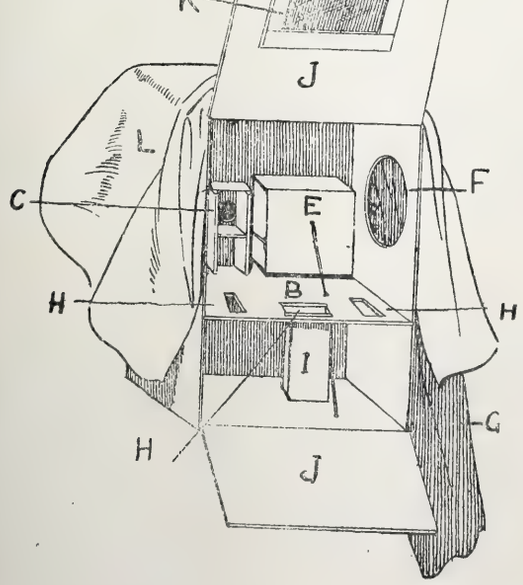
A. Haddon.
F. B. Grundy.

FERROTYPE APPARATUS.

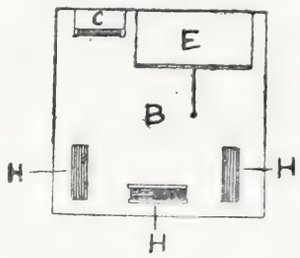
Messrs. Thomas & Whitworth have devised an improvement in photographic apparatus specially adapted for ferrotype dry plates. The apparatus consists of a wooden box, A, the size of which should vary



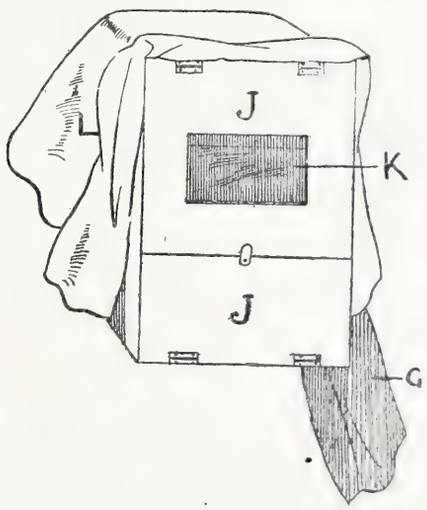
according to size of plate operated on. The box is divided by a horizontal partition, B. In the upper portion, on the left-hand side (viewing from the back) is placed the camera, C, consisting of four wooden sides, the inside measurement being slightly smaller than the plate in use, and



the length according to the back focus of the lens used. One end of the camera is fixed against the front of box, D, a hole being made in the front opposite the centre of camera, the lens being fixed outside in the ordinary way, and at the other end a piece of ground glass is inserted serving as a focussing screen, two small grooves being made in front of the focussing glass to take the plate. On the right-hand side a box, E, or plate-carrier, is fitted, having a door closing automatically by means of a spring, the door being opened by means of a cord which runs through the horizontal partition and also through the bottom of box, and is within easy reach of the operator's left hand, the right hand being used to convey



the plate from carrier to camera, an opening, F, being made in the right side of box and fitted with a sleeve, G, of black cloth, so that the light may be excluded while the hand is inserted. In the back part of horizontal partition, three openings, H, are made, as close to the window as possible, to take the fixing, developing, and washing-off tanks or baths, I, The back of the box is fitted with folding doors, J, hung horizontally.



with suitable fastening at the centre, and in the upper door a sheet of non-actinic glass, K, of the desired size, is inserted. The upper door can be raised when focussing a sitter, a piece of black cloth, L, being fastened on the top of the box so as to shroud the operator.

The mode of operation is as follows: After focussing the sitter and closing the door, a plate is taken from carrier and placed in front of focussing screen, and the exposure is made in the usual way. The exposure having been made, the plate is removed by means of holders of the well-known forms, as in general use by photographers provided for the purpose, and by the use of which the plate never leaves the operator's hands till finished. It is then passed through the fixing, developing, and washing tanks or baths, the whole operation being watched through the non-actinic glass window, thus avoiding all liability to under or over-develop.

CITY AND GUILDS OF LONDON TECHNICAL INSTITUTE: EXAMINATION IN PHOTOGRAPHY.

This Examination will be held in the month of May next.

Ordinary Grade.

I. *The Practical Examination* will include the following tests: To focus, expose, and develop a negative of a person or landscape; to print, tone, fix, and mount an ordinary print.

The candidate may elect to make his negative in collodion or gelatine, and his print may be produced by any of the methods in ordinary use.

II.—*The Written Examination* will include questions founded on such subjects as the following:—

1. The elements of photographic optics; the photographic camera and its adjuncts, lenses, diaphragms, shutters, shades, &c.

2. A general knowledge of the practice and theory of the wet-plate process.

3. The practice and theory of the gelatine dry-plate process; the composition of and defects in gelatine dry plates.
4. Various methods of fixing, developing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.
5. Silver printing, including vignetting and printing in clouds, toning, and fixing.
6. Retouching and spotting; mounting prints.
7. The lighting of the dark room.
8. The studio, and lighting of the sitter.

The fee for the Written Examination is one shilling.

Honours Grade.

The Honours Examination is both Written and Practical, and consists of two Sections: A. Pure Photography; B. Photo-mechanical Processes.

Section A.—Pure Photography.

I. *Written Examination*,—Candidates will be expected to answer more difficult questions in some of the subjects for the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory of the photographic image, of development, fixing, intensification, and reduction.
2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.
3. The principles of photographic optics.
4. The theory and practical use of sensitometers for testing the speed and gradation of plates, and their uses in printing processes.
5. The general principles of various negative processes which have been employed at different times.
6. Platinotype, carbon, and pigment printing, printing on argentic bromide papers; enamels.
7. Enlarging and making lantern slides in the camera.
8. Applications of photography to scientific purposes.

II. *Practical Examination.*—Candidates may be examined in (*a*) Studio work, (*b*) Copying or Reproduction, or (*c*) Landscape and Architecture. They will be required to show proficiency in conducting any of the following practical operations appertaining to the branch selected:—

1. To take in a studio a quarter-plate gelatine negative of some object to be indicated.
2. To take an artistic portrait.
3. To print, tone, fix, and mount a silver, platinotype, or carbon print.
4. To test a sample of glass or fabric to be used in lighting the dark room.
5. To test the sensitiveness and gradation of a plate.
6. To find the focus of a lens either corrected or uncorrected.
7. To copy an engraving for a lithographic transfer.
8. To make an enlargement from quarter-plate.
9. To make a lantern slide by contact.
10. To make in the camera a lantern slide from a negative.

Section B.—Photo-mechanical Processes.

I. *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects of the Ordinary Grade, and, in addition, to show a practical knowledge of the principles and operations in one or more of the following processes:—

1. Photogravure.
2. Line negatives and line blocks.
3. Half-tone negatives and half-tone blocks.
4. Chromo-typography (negative and blocks for three-colour process).
5. Photo-lithography.
6. Collotype.

II. *Practical Examination.*—Candidates may be required to show proficiency in practical operations in one or more of the above processes, numbered 1, 2, 3, 4, 5, 6, including the preparation of negatives suitable for each class of work, from (*a*) pictures in colour, (*b*) drawings in monochrome, (*c*) originals in black and in tints, (*d*) natural objects.

The following questions were put at the Examination held last May. The examiners were Mr. Lyonel Clark and J. D. Geddes:—

Ordinary Grade.

[*Seven questions only to be answered.*]

1. How would you proceed to extemporise a focussing screen if the ground glass of the camera were destroyed?
2. What is meant by plano-convex, plano-concave, double concave and meniscus lenses?
3. How would you proceed to develop a plate that you knew to be over-exposed?
4. Give a formula for an intensifier suitable for producing the greatest possible effect on a gelatine plate.
5. Describe how you would proceed to varnish a negative.
6. How would you proceed to improve or "fake" a negative of a landscape so as to obtain a better print?
7. Describe the whole process of producing and finishing a print on albumenised silver printing paper.
8. How would you proceed to pose a short woman so as to obtain a portrait giving the appearance of increased height and dignity?
9. Describe a good "backing" for plates, its method of application, and your reason for selecting the same.
10. What is meant by the "equivalent" and "back" foci of a lens?

Honours Grade.

Section A.—Pure Photography.

[*Six questions only to be answered.*]

1. Describe how you would test the speed of photographic plates.
2. Describe the preparation of a rapid gelatino-bromide of silver emulsion.
3. Describe the method of enlarging by means of the solar camera.
4. Describe the different methods that have been proposed for producing photographs in natural colours by the use of a single negative.
5. Describe and discuss what is known as photography by means of the Röntgen or X rays.
6. Give the causes of the loss of light on the margins of a picture taken by a wide-angle lens.
7. Describe the principle of the Cinematograph.
8. Discuss the best form of shutter for obtaining photographs of very rapidly moving objects.
9. Describe the theory of orthochromatism, and give a formula suitable for any desired result.

Section B.—Photo-mechanical Processes.

[*Eight questions only to be answered.*]

1. Describe the principle of the sensitometer as applied to photo-mechanical exposures generally.
2. Describe the process of making a photogravure plate by the carbon process, giving details as to the etching solutions employed and their proper strengths.
3. State shortly the best method of retouching a photogravure plate after etching, and say how such plates are finished ready for printing.
4. If an original picture measures 7½ inches by 5 inches, what will each dimension be if the base is reduced by 2 inches? Draw or describe a short method of accurately ascertaining proportionate reductions.
5. Describe the treatment of a wet-plate negative for line work, developing, intensifying, fixing, and preparing it for printing on metal, with formulæ.
6. Give formulæ for sensitising solutions, and describe the operations necessary for printing line negatives on zinc.
7. Give a detailed description of the process of etching a zinc line block.
8. Describe the operations of preparing negatives by the half-tone process, with formulæ.
9. What kinds of original drawings and photographs yield the best results by the half-tone process? and state what modifications of treatment are necessary in making tone negatives of (*a*) silver prints, (*b*) bromide prints, (*c*) wash drawings.
10. Give details of operations and formulæ for printing half-tone negatives on zinc and copper.
11. Describe fully the operations of etching half-tone blocks on zinc and copper.
12. Detail the operations of preparing negatives for photo-litho transfers, and state the special qualities required in such negatives.
13. Describe the method of preparing, sensitising, and printing the paper for photo-litho transfers; also explain the operation of inking and completing the transfer ready for transferring to stone. Give particulars of a process for producing a photo-litho transfer of a half-tone subject, such as a photograph or wash drawing.
14. Describe a mode of stripping collodion and gelatine negatives and laying them down so as to print two or more at one time.
15. Give a description of the method of preparing collotype printing plates, with formulæ.
16. Describe generally the principles of printing from collotype plates, stating the treatment of the plate, and the kind of ink, etching solutions, &c., employed.

Practical Examination.

Section A.—Pure Photography.

[Only *one* test to be made.]

(A) *Studio Work.*—Take a portrait giving a "Vandyke" effect.

Three plates, ¼ size, are supplied and two are to be sent in, but the candidate must select himself which one he considers the more successful.

A rough print should, if possible, accompany the negative. The exposure must be made in the presence of the Local Examiner, but the plates may be developed at home, the results being handed in or posted.

(B) *Reproduction or Copying.*—1. Print and tone a print from a negative (supplied by the Institute) on printing-out gelatinised paper. The Institute will provide the paper, but the centres or candidates must provide frames, dishes, solutions, &c.; *or* 2. Produce a print in platinotype (cold-bath process) from the negative provided for the purpose. The Institute will provide the tissue or the platinotype paper, but the centres

or candidates must provide frames, dishes, water, &c., with the exception of the platinotype developer, which will be provided the same time as the paper.

(c) *Landscape and Architecture.*—Expose and develop a negative of the place or building selected by the Local Examiner.

SECTION B.—PHOTO-MECHANICAL PROCESSES.

INSTRUCTIONS.

Candidates may select any one or each of the tests from any one Section; but they may not take tests from more than one Section.

(A) *Photogravure.*—Make a transparency from a negative for photogravure (*a*) by the carbon process, (*b*) by the dry-plate process; lay a photogravure grain on a piece of copper, and fix it ready for receiving the "resist;" print a carbon "resist" from a transparency, develop on copper, prepared for etching, and etch the plate.

(B) *Line Block.*—Make a negative of a line subject by the collodion process; print a line negative on zinc by the albumen or bitumen process, develop and prepare the plate for etching; etch a zinc block of a line subject from a prepared plate.

(C) *Half-tone Block.*—Make a negative of a photograph for the half-tone process; prepare a plate on copper or zinc by the enameline process, and print, develop, and etch the plate.

(D) *Photo-lithography.*—Sensitise a sheet of transfer paper, print, ink, and prepare the transfer for stone.

(E) *Collotype.*—Strip an ordinary dry-plate negative, reverse and transfer to glass, ready for printing; coat a collotype plate with solution, dry and expose under a negative, and prepare the plate for printing.

DETERIORATION OF PAPER.

THE Council of the Society of Arts have appointed the following Committee to investigate the causes of the deterioration of paper: Major-Gen. Sir Owen Tudor Burne, G.C.I.E., K.C.S.I., Chairman of the Council; Sir William Anderson, K.C.B., D.C.L., F.R.S.; Michael Carteighe; C. F. Cross, F.C.S.; Sir John Evans, K.C.B., D.C.L, F.R.S.; Richard Garnett, C.B., LL.D.; Hugo Müller, Ph.D., LL.D., F.R.S.; W. J. Russell, Ph.D., F.R.S.; William Luson Thomas, R.I.; Professor J. M. Thomson, F.R.S.; Henry R. Tedder, F.S.A.; Dr. Quirin Wirtz, M.A., F.I.C.; Sir Henry Trueman Wood, M.A., Secretary.

The following circular letter has sent to those who are interested in the preservation of paper, with the object of obtaining information which may be of use to the Committee:—

SOCIETY OF ARTS,
John-street, Adelphi, London, W.C.,
August, 1897.

DEAR SIR,—It has been brought to the notice of the Council of the Society of Arts that many books of an important character are now printed upon paper of a very perishable nature, so that there is considerable risk of the deterioration and even destruction of such books within a limited space of time. This is believed to be especially true of books which are in constant use for purposes of reference, and are therefore liable to much handling.

Although a great deal of investigation has been made into the subject in Germany, the matter appears to have attracted but little attention in this country. The Council therefore readily acceded to a proposal made to them, and appointed a Committee to inquire into and report upon the whole subject.

This Committee would feel very much indebted to you if you would tell them whether you have noticed any instances of books, published within the past thirty years, which already show signs of perishing, especially in the case of books which have been much used.

They will also feel much obliged if you will favour them with any other information which you think might assist the Committee, or with any suggestions which your experience might lead you to make.—Yours faithfully,

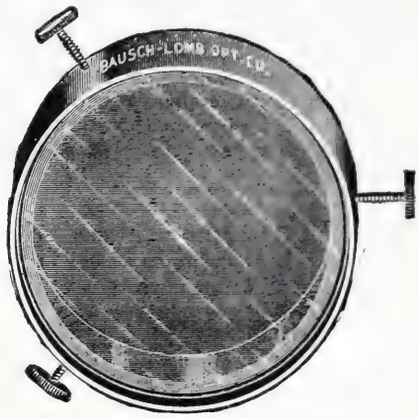
HENRY TRUEMAN WOOD, *Secretary.*

Our Editorial Table.

BAUSCH & LOMB'S RAY FILTER.

Agents: A. E. Staley & Co., 35, Aldermanbury, E.C.

THIS ray filter is designed to take the place of the yellow screen in orthochromatic work. It consists of two thin pieces of optical glass, the surfaces of which have been ground and polished plane and parallel. Between these plates is cemented a glass ring of uniform thickness throughout, forming a cell of proper depth, in which is contained bichromate of potash solution. The glass part is mounted in a neat metal ring, which protects it and holds the filter firmly in the proper position upon the *front of the lens.* It is recommended that the filter should not be placed at the diaphragm of the lens, as any refraction caused by it would be greatly magnified in the image; nor at the back of the lens, being in that position inaccessible if it is desired to make a quick change for instantaneous work. The following instructions are given for changing the solution in the cell: Remove the metal ring which holds the cell in the mounting by inserting the tip of a blunt knife blade under it, where the two ends meet, and lift one end out; carefully remove the cell from the mounting; lift off metal plate and rubber band, using care not to lose either; hold the cell with the holes down and remove the desired quantity of fluid with the pipette; to refill the cell, hold the cell so

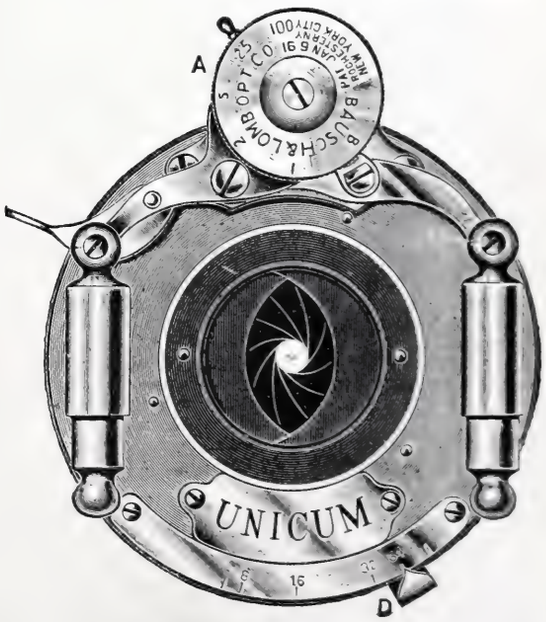


that the holes will be uppermost, and introduce the solution through one hole until all the air and one drop of fluid have been expelled through the other; place rubber band over both holes; place metal plate on rubber band so that the two studs will be directly over holes, and, pressing between and beneath edge of glass discs, slide into the mounting. Do not allow the ray filter to freeze. With the filter a supply of the standard bichromate solution and a pipette are given, and Messrs. Bausch & Lomb have prepared an explanatory pamphlet, illustrated by photographs, taken with and without the filter, showing the advantages gained in the employment of colour-corrected plates when exposed to filtered light.

BAUSCH & LOMB'S NEW TIME AND INSTANTANEOUS SHUTTER.

Wholesale Agents: A. E. Staley & Co., 35, Aldermanbury, E.C.

THIS shutter is the result of a lengthened study to produce a low-priced instrument, perfect in its working and construction. In appearance it differs very little from the shutter which has been now for some years before the photographic public. It has both pneumatic and finger release, and instantaneous exposures of various



rapidities can be given. By adjusting the controlling dial, any exposure may be given while retaining the pressure on the ball, or, by further adjustment, indefinite exposures may be given at pleasure. The shutter is of high-class workmanship, neat in appearance, and compact, fitting between the combinations of lenses. At the present time only two sizes are ready, viz., 5×4 and 7×5. Others will be made as soon as the necessary tools are finished.

Photogravures of "The Sign of the Cross."

Published by Marion & Co., Soho-square, W.

One of the most popular plays of recent times is, undoubtedly, "The Sign of the Cross," the scene of which is laid in Rome, at the time when Paganism and Christianity were struggling for the mastery of the Eternal City. The characters of Mercia, the devout heroine of the play, and Marcus Superbus, the converted patrician, so admirably impersonated by Miss Maud Jeffries and Mr. Wilson Barrett, have deeply impressed themselves upon the popular imagination, a circumstance of which due advantage has been taken by the well-known photographers, Messrs. W. & D. Downey, of Ebury-street, who, in the pictures before us, have chosen some of the most notable scenes of the play for portrayal. The photographs have been extremely well taken and reproduced in photogravure, and we are sure they will successfully appeal to the sympathies of a very large number of people.

Process Mirrors.

Sharp & Hitchmough, 101 and 103, Dale-street, Liverpool.

Messrs. Sharp & Hitchmough have sent us one of their process mirrors, 7 × 4 in., which they are now placing on the market. This has a beautiful surface, and is admirably adapted for the purpose. They inform us that they undertake the resilvering of the mirrors at moderate rates; and they also supply prisms. Both the mirrors and prisms are supplied at low prices, and we have no doubt will be largely in request by process workers.

News and Notes.

We are sorry to learn of the death, at Davos, of Mr. M. J. Michael, a clever photographer, and an occasional contributor to these columns and our Almanac.

Corporal Thornhill, of the Royal Engineers, Chatham, found guilty by Court-martial of misappropriating photographic apparatus from the Military Photographic School, was on Monday sentenced to two months' imprisonment.

Dulwich Photographic Society.—The above Society have changed their address to the Malmesbury College, East Dulwich-road; the first meeting at the new rooms took place on September 14, when a lantern entertainment was held. The Society still has a few vacancies for membership, applications to be addressed to the Secretary at the above address.

The Photographers' Direct Supply Association of 151, High-street, Nottinghill, write: "While thanking you for your notice of our P.O.P., may we point out that our address is as above, not 157, High-street, as stated by you. As this is likely to cause inconvenience both to our customers and ourselves, we shall be much obliged if you can correct it in your next issue."

Photographic Club.—The annual outing to Hampstead Heath is fixed for Saturday next (to-morrow), the 18th inst. Tea at the Bull and Bush at six o'clock. Wednesday evening next, September 22, Trade Night. Mr. F. H. Sanderson, of Cambridge, will show his new camera. Manufacturers and dealers desirous of exhibiting novelties, please address the Hon. Secretary (Mr. F. A. Bridge), East Lodge, Dalston-lane, London, N.E.

Anglo-French Filoscope Syndicate (Limited).—This Company has been registered by Mr. G. Machieu, of 15, Victoria-street, Westminster, S.W., with a capital of 5000*l.*, in 1*l.* shares. The objects of the Company are to acquire, work, develop, turn to account, and deal with the patent rights owned by H. W. Short in England, France, Italy, Austria, Germany, and the United States, and to enter into an agreement with him for the purpose. Registered without Articles of Association. Registered offices, 15, Victoria-street, Westminster, S.W.

The Filmless Animatograph (Limited).—This Company has been registered by Messrs. Steadman & Van Praagh, of 23, Old Broad-street, E.C., with a capital of 6000*l.*, in 1*l.* shares. The objects of the Company are to enter into an agreement with Leo Kamm, and to manufacture, sell, exhibit, and deal with photographic and scientific apparatus and materials. The first Directors, to number not less than three, nor more than seven, are to be nominated by the subscribers. Qualification, 50*l.* Remuneration as the Company may decide.

Messrs. R. J. Moss & Co., of Abingdon, write: "We beg to enclose a photograph taken after dark by acetylene. The generator used was the Abingdon Safety light, supplied by the Abingdon lantern jet, with adjustable reflector, and fitted with two of Bray's 00000 burners. An ordinary plate was used, exposure about twelve seconds. The photograph was taken without any manner of preparation, and has not been faked at all, either on negative or print." The photograph sent is a very good example of work done by the acetylene light.

The Artists' Guild.—The Ninth Annual Exhibition of amateur art work will be held at the Imperial Institute, November 1 to 13, under the immediate patronage of Princess Christian. The Exhibition is open to all amateurs. Prizes are offered for embroidery, fans, oil, pastel, and water-colour painting, wood-carving, bent iron, burnt-wood engraving, cut and tooled leather, brass *repoussé*, photography, &c. Full particulars can be had from the Secretary, Lieutenant-Colonel Bacon, the Royal School of Art Needlework, Exhibition-road, South Kensington, S.W.

A New Liquid Glue.—A new liquid glue has been introduced, which, from its ready adaptability to all conditions—purity, cleanliness, and utility—will find favour. "Scoli" liquid glue is a genuine preparation of glue in a state of solution. It contains no acid, antiseptic, or other injurious ingredient. It is always ready for use, requires no heating, and can be kept for an extended period without any diminution in its strength or becoming putrid. It is inexpensive and economical, and will be found invaluable for the repairing of all leather articles, chairs, glass and china, earthenware, cloth, paper, photo-mounting, and in fact almost every article.

Glasgow Photographic Exhibition.—"Justice" writes to the *North British Daily Mail:* "From inquiries made, after seeing the above Exhibition, I regret to learn that the majority of medals were taken by the Hanging Committee, and that they also assisted in the judging. Is this fair to the other competitors? I am sure no other Exhibition of this kind has been held where competitors were allowed to constitute the Hanging Committee, and also to assist the Judges. Allowing competitors to display their names on frames before and during the judging was surely an irregularity, and this would not tend towards the awards being given for pure merit."

Messrs. Swain & Son, of Barnet, have recently greatly increased their business, and have built a new studio, which will double their already extensive production of high-art photographic studies. The new studio has been fitted throughout with electric arc lamps by Mr. Henry J. Rogers, A.I.Elec., M.I.M.E., of Watford, who has introduced a number of his patent traversing gears into photographic studios of late in all parts of the kingdom. The heating of the studios has also been intrusted to Mr. Rogers, who has carried out a very comprehensive scheme, which has proved quite successful, substituting hot-water coils for the old method of exhaust-steam heating, and fitting up a new and extended service in the new parts of the studio. The whole range of buildings is now as complete as it is possible to make an establishment of this kind, and Messrs. Swaine & Son are to be congratulated upon the rapid strides and the great improvements they have effected in the various branches of photography to which they have applied themselves.

A photo-voltaic theory of photographic processes forms the subject of a lengthy investigation by H. Luggin, *Zeitschrift für Physikalische Chemie*, xxiii. 4). It was shown by Becquerel, in 1839, that the haloids of silver are capable, under certain conditions, of giving rise to photo-voltaic currents; and Herr Luggin finds a close connexion between these currents and the decompositions which give rise to photographs. A remarkable feature is the reversal of the voltaic current when a certain potential has been reached, a consequence of which is that the same electrode is capable, according to circumstances, of giving rise to currents of opposite signs, and these Herr Luggin distinguishes as "normal" and "solarisation currents." The former are the more susceptible to blue, and the latter to yellow light. The whole investigation tends to throw light on the much-debated theories of photographic action, by showing that both the latent picture of photographic negatives and the visible transformations of the printing-out process have their counterpart in definite photo-voltaic phenomena.

Charterhouse Science and Technical Schools, and Rogers' Memorial Institute.—The winter session of this—one of the largest Science Schools in the United Kingdom—will recommence on Saturday, October 2, 1897, under the presidency of the Rev. Henry Swann, M.A. During the late session, upwards of 1000 students, mostly elementary teachers, availed themselves of the privileges afforded by this Institution, and of this number upwards of 700 presented themselves for examination. The students prepared for the London Board School (Int.) examination highly distinguished themselves. Instruction of a practical character is given in most of the sciences at a very nominal fee. Those who have leisure can attend, at a very moderate charge, the day science classes. Day classes will also be held to prepare candidates for matriculation (London), clerical, medical (including dental), legal, and other examinations. Students who aim at becoming proficient in physics and chemistry have the opportunity of working in well-fitted laboratories. During the coming session, artisans, apprentices, improvers, and others, will have the privilege of attending the London County Council Technical Classes. Workshop, arithmetic, mechanics and mathematics, practical chemistry and physics can, all be studied for the inclusive fee of 2*s.* 6*d.* Full particulars of the classes may be obtained from C. Smith, Organizing Secretary. Those interested in education will rejoice to learn that the work commenced by the late Rev. W. Rogers, M.A., and ably continued by the late Rev. John Rodgers, M.A. (formerly Vice-Chairman of the London School Board), is so vigorously continued by the present President and Committee.

Death of a Farnworth Photographer.—A painful impression was created in Farnworth on Thursday afternoon, September 9, by the receipt of a telegram from Castleton announcing the sudden death of Mr. Richard Brown Berry, of the firm of Messrs. R. B. Berry & Sons, photographers, Moses Gate, Farnworth. The deceased gentleman left Farnworth at 7.45 on Thursday morning, accompanied by Mr. W. Hubbard, of Farnworth, for a day's holiday in Derbyshire. He had not been in the best of health for some time past, having been attended by Dr. Bradley for catarrh of the stomach. He appeared to be perfectly well and in good spirits during the journey to Castleton. He alighted with his friend at Edale, and the two commenced to climb the high hill to Winnate's Pass, photographing the scenery by the way. They reached Castleton about noon, but on the way Mr. Berry complained of a slight headache and pains in his chest, and also told his friend during dinner that he felt very queer. They afterwards strolled through Castleton, but on the way Mr. Berry complained of being unwell, and was persuaded to rest in a cottage restaurant. As he became worse, Mr. Hubbard sought medical assistance, and returned just in time to see his friend fall unconscious on the floor. Everything possible was done to restore animation, but Mr. Berry expired in a few minutes. The deceased gentleman was in his fifty-second year, and was a native of Chorley. About eighteen years ago he went to reside at Moses Gate, and began his present photographic business. He had attained considerable success both in landscape photography and portraiture. In 1887

he carried off the medal of the Photographic Society of Ireland for the best landscape work at the Triennial Exhibition in Dublin, and he also gained other honours.

DO PEOPLE HAVE A TRUE CONCEPTION OF THEIR LOOKS?—It has been said, by one who ought to know, that no man has any clear conception of how he himself looks. The expression of the face is continually changing. No artist, no camera, can catch this changing, fleeting, evanescent expression. When you look in the glass, the very intent to find out how you look is depicted on your face. The more you strive, the more the intent is intensified, and such an expression is not natural to your face. How often do we look at a photograph and find only disappointment in it? Why is this? The camera depicts the sitter just as he is at the moment the picture is taken, but very seldom can the instrument catch and record that subtile thing called "natural expression," because few persons are natural when seated before the camera. Well, what of all this? Simply this: If you are noble, loving, and true, such virtues will light up your face; if you are sordid, mean, and selfish, your face proclaims it to the world. Anything in your life that is active for either good or evil will impress itself upon your personal appearance. Pride, scorn, hate, and lust write themselves indelibly in the physiognomy. When such ignoble qualities rule the life and have become habitual, they are impressed on the face and finally become habitual to the countenance, and the features themselves become permanently changed to accord with such expressions. It has often been remarked that persons who have been married for a long term of years come to look something alike, nor is this surprising when we call to mind that their life and environment is one made up of the same joys and sorrows, the same hardships and trials, and the same successes and pleasures—in short, the intellectual and spiritual atmosphere of both is to a considerable extent identical, and we know that these things affect the physiognomy often to such a degree as to mould the physical features of the face into the same shape.—*Journal of Medicine and Science.*

Patent News.

THE following applications for Patents were made between August 30 and September 4, 1897:—

FINDERS.—No. 19,956, "Improvements in the Manner of Using View-finders in connexion with Photographic Hand Cameras." A. L. ADAMS.

CHANGING PLATES, &C.—No. 19,957. "Improvement in Means whereby Sensitised Plates or Flat Films used in Photographic Cameras may be Inserted and Made Ready for Use in Daylight, without having Recourse to Dark Rooms and the Like." A. L. ADAMS.

PACKS OF FILMS.—No. 19,958. "Improvements in Means of Separating Sensitised Plates or Films Arranged in Packs or Series in Photographic Cameras or Changing Boxes." A. L. ADAMS.

PACKS OF FILMS.—No. 20,017. "Improvements in Means of Separating Sensitised Plates or Films Arranged in Packs or Series in Photographic Cameras and Changing Boxes." A. L. ADAMS.

COMPASS.—No. 20,054. "Photographer's Light and Time Compass." C. R. TUCKER.

STEREOSCOPIC CAMERAS.—No. 20,115. "Improvements in or relating to Portable Stereoscopic Cameras and Like Instruments." Communicated by P. Molinari. A. J. BOULT.

ANIMATED PHOTOGRAPHS.—No. 20,150. "Improvements in Apparatus for Photographing Objects and Exhibiting Moving Pictures." H. KINSEY and A. MILLARD.

ANIMATED PHOTOGRAPHS.—No. 20,296. "Improvements in and relating to Apparatus for Obtaining and Displaying Kinematographic or Zoetropic Pictures." H. URRY LD., and G. HAYDON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
18	Croydon Camera Club	Excursion: Betchworth Village and the River Mole. Leader, The President.
20	Bradford Photo. Society	*Lantern Slides.* W. T. Wilkinson.
20	North Middlesex	*Various Enlarging Processes.* H. Stuart.
20	Southland	Series of not less than Four Prints Illustrating a New Zealand Industry.
21	Aintree	*Enlargement.* Messrs. Harris and Travis.
21	Brixton and Clapham	*At Home Subjects.* W. Thomas.
21	Gospel Oak	Exhibition of Members' Lantern Slides.
21	Hackney	*Why we Use the Lens, and How.* Rev. F. C. Lambert.
22	Bolton Mutual Photo. Society	Excursion: High Rid, Heaton, and Bob's Smithy. Leader, Mr. Patterson.
22	Croydon Camera Club	Conversational Meeting.
22	Leeds Camera Club	*Marvels and Curiosities of Photography.* W. Booth.
22	Photographic Club	Trade Night: Novelties, &c.
23	Bradford Camera Club	Demonstration on Bromide Printing. A. Coe.
23	London and Provincial	Open Night.
24	Croydon Microscopical	Trial Night: Members' Slides.
25	Aintree	Excursion: Wirral District. Leaders, Birkenhead Photographic Society.
25	South London	Excursion: Hampstead. Leader, W. C. Boyce.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 9,—Mr. A. Mackie in the chair.

A number of large views of the district visited by the Convention this year, and a copy of the official group by Mr. Frank H. Sayers, were kindly brought up by the late Secretary, Mr. R. P. Drage.

Mr. J. E. HODD, adverting to last week's discussion on the use of the Novitas paper for the transparency in enlarging, said he had since made some trials in this direction. An examination of the original negatives, the Novitas transparencies from them, and the enlarged negatives, would show, he thought, the suitability of the process, which, moreover, was one of the simplest he had worked. There was practically no structure or grain to speak of, and the ease with which one can reverse the film renders it just the thing for carbon printing.

Attention was drawn also to the improved quality of the reproduced negative over the original, which was faulty in the matter of exposure.

The question set down for consideration was: "What is the best printing paper as regards its power in printing and after-treatment?"

The HON. SECRETARY, for his own part, had found that, for general work and the application of pencil and brush, nothing was equal to bromide paper, with which more could be done than was the case with any other paper.

At this point, many thinking that brush and such work was merely retouching, a stricter definition of the "after-treatment" was required of the Chairman, who understood it to relate more particularly to the chemical after-treatment—reduction, intensification (whole, or in part), and methods of altering the colour from its original state.

Mr. HODD agreed that bromide paper was probably the best. It permitted of more adjustment in printing than did any paper he knew, and, if one might include "faking," it lent itself very easily to improvement with bromide chalks. Platinotype paper was perhaps the next on the list, but the silver papers were not so good.

Mr. WELFORD considered bromide paper more amenable to treatment, alike in exposure, development, and any subsequent processes, than any paper of the present time. In development there is an enormous power with bromide paper to affect the result, and tones ranging from brown to the brightest cardinal red may be obtained by increasing the exposure. It is open to local development, and, in contrast with gelatino-chloride papers, bromide paper gives one colour, regardless of the character of the negative. Subsequent clearing, either of the whole or parts, is easy, but not so platinotype, carbon, and others. The use of rubber, too, readily altered the surface of bromide prints; with platinum partially, and with chloride papers or carbon practically nothing.

Mr. E. BANKS said the usefulness of bromide paper was the least of all. Chloride paper was far easier to treat than bromide, with which, too, one could not get a dozen prints all alike. The carbon process was the only one lending itself to all the uses a photographer can have for it. Tissue of any colour could be had, any effect could be got, it was perfectly under control in development, and gave also absolute permanency. "Doctored" prints of whatever sort are not of much use, and do not last long.

Mr. P. EVERITT did not believe in confining oneself to one particular paper. Carbon lent itself to various kinds of negatives. Bromide can give effects not obtainable with carbon, and so on through the whole list.

Mr. BECKETT likewise saw no inducement to confining himself to one paper, adding that he would not adopt bromide as the general stay and backbone of his business.

The CHAIRMAN said that, by resorting to various kinds of developing processes, considerable differences in tones could be produced. There was the use of pyro soda developer for bromide prints, giving very pretty sepia tones, supposing the exposure is suited to the development. No stain whatever need result if enough sulphite be employed. The developer should be weak in pyro, with sufficient restrainer not to fog the paper, and enough sulphite to prevent the staining of the gelatine.

Mr. HODD, on the assumption that lead in a combined toning bath was conducive to yellowing and fading, inquired for some easy way of testing for the presence of lead in such a bath.

Mr. BANKS replied that a chromate would yield a yellow precipitate with a bath containing lead. On the subject of sulphur toning, he observed that it did not follow that prints so made faded. It had a bad reputation, which it would be long in losing, but in some forms it is as permanent as gold itself.

PHOTOGRAPHIC CLUB.

SEPTEMBER 8.—The Recorder read from a London daily paper the particulars of an alleged new X-ray discovery, which an American doctor puts forth in all seriousness. It was to the effect that it was possible by photographing an ordinary photographic print of a person to reveal by the X rays just the same internal details of the body as if the X rays had been used directly upon the body itself.

The Club, without venturing an opinion as to the genuineness of the reported discovery, were certainly of opinion that, if this could be done, it would be extremely awkward in many ways.

Several members had, during the afternoon, visited the Historical Photographic Section at the Crystal Palace under the leadership of Mr. Foxlee, and were delighted with the outing.

A discussion took place as to securing that gentleman's original manuscript, which gave a very full account of the exhibits, with a view to its enriching the library of the Club.

The remainder of the evening was devoted to a friendly chat over various subjects, such as the shortest-focus lens that could be used for a given size plate, Mr. BRIDGE stating that for a half-plate four inches was the workable minimum, although he had a special pair of three inches focus which answered excellently.

Another matter touched upon was the curling of collodion paper, Mr. WELFORD stating that the amount of the curl was dependent upon the depth of the solution used.

One member stated that he was using an American brand of collodion paper in his business with complete success.

Hackney Photographic Society.—September 7, the President (Major Woolmer Williams) in the chair. Excursion reports and announcements were given by the Excursion Secretary. After other business had been settled, the rest of the evening was given to the lantern, when a number of slides by Messrs. Fenton-Jones, Rawlings, Rita, and other members were shown.

North Middlesex Photographic Society.—September 6, Mr. H. A. Rutt in the chair.—Mr. Henry Crouch showed a hand camera (Dresser pattern) that had had a lot of rough usage and travelling, and which worked just as well now as when new. The shutter was fitted with a band brake regulated by a screw pressing on a spring. Mr. Tilly showed a negative with curious markings, which appeared to be in the emulsion itself, and not caused by outside influence. Mr. Angus showed a couple of transparencies on Novitas stripping film, which he used to make enlarged negatives from, and had failed to get the clouds with sufficient contrast. A remedy was suggested that the transparencies should be printed darker.

September 13, Mr. S. E. Wall in the chair.—Mr. H. W. Hobden was elected a member of the Society, and Mr. A. T. Crane was nominated. Mr. Marchant then read Mr. E. C. Hertslet's paper on

Toning Platinum Prints.

Examples were passed round, showing the capabilities of the process. Mr. Marchant then toned a few prints according to the directions, which were finished in a very short time, the colour in some being a good warm sepia. After some discussion, a vote of thanks was passed to Messrs. Hertslet and Marchant. Mr. S. R. Schofield showed some negatives completely spoiled by wet and damp, the gelatine being completely eaten away in parts.

South London Photographic Society.—The first meeting of the Society after the recess, on September 6, was devoted to a lantern entertainment by Mr. C. F. Dickinson, *A Trip in the Engadine*. He first deal with Coire and the details of its Cathedral, and then passed to the village at Thusis and the Schyn Pass. Tiefenkasten and Molins were respectively dealt with, after which Silva Plana and the surrounding scenery received a considerable share of attention, particularly the woods and Surlei Cascade. The Lake of Sils and the various villages on its banks were fully described, and then passing on to Campfer village and lake, thence to St. Moritz, Pontresina, and Pis Languard, which were carefully illustrated. The Roseg and Morterasch Glaciers were in turn dealt with, as also were the villages of Samaden, Bevers, with its ornamented houses, Madulein, the Weissenstein Valley, and the Albula Pass, and, after a short notice of Filisur, Coire was again reached.

Bradford Photographic Society.—September 8.—Mr. Percy Lund ("Matthew Surface") delivered his lecture,

Some Photographers I Have Met.

The chair was occupied by Mr. A. P. Rendell, and the audience listened with much interest to the partially anecdotal and partially biographical "recollections" of the lecturer. Mr. Lund pointed out that he intended to deal only with those who had won laurels already, even though their names were not as prominently before the public as one might expect in some instances. Of course, the premier position among the photographers he had met must be given to H. P. Robinson, whose splendid *genre* studies had proved such incentives to others who were stirred to emulate and follow in the footsteps of this veteran artist. Mr. Robinson had given the whole of his life practically to picture-making with the camera, and at the ripe age of sixty-seven he was still as enthusiastic and as hopeful as when a mere lad. Turning to Andrew Young, the lecturer told how this gentleman, although perhaps not quite so well known as he deserved to be, was producing high-class work both pictorially and technically. Mr. Young had been a born painter, but, alas! or perhaps luckily for photography, the pursuit of the painter's art pure and simple had been denied him, and so photography had gained a painstaking and capable man. Bernard Alfieri was next spoken of. Mr. Lund touched upon his determination to be a picture-maker by photography, and pointed out the beauties of his work in the Norfolk Broads, which in many instances glowed with a mysterious and poetic splendour, due mainly to careful attention to composition and the introduction of skies eminently suited to carry out the theme. Horatio Nelson King was next food for several amusing and interesting anecdotes, his early life and trials in the Daguerreotype days showing most markedly the difference between photography then and now. Mr. King was the Queen's photographer, and had made over three hundred journeys to Windsor Castle, while the shelves of his studio groaned under the weight of negatives of celebrities past and present. Another photographer the lecturer had met was A. Horsley Hinton, that great delineator of mud flats and marshland, who from simple materials was able to produce compositions which could not help but be striking, and which riveted the attention in whatever gallery they were hung. Mr. Hinton, by a few deft touches, was able to surround even commonplace objects with the glamour of poetry. Quite different to the last-named artist, in style and everything else, was the late Robert Terras, who, alas! had been cut down in the midst of a most promising career. Mr. Terras was one who took infinite pains, and did not mind how much trouble he went to so long as he got good results at the finish. His were all homely *genre* studies, but every detail from dress to surroundings was so well thought out and harmonised, that when seeing them the power of photography as a picture-maker was brought most strongly home to the mind. Last, but not least, said the lecturer, came Craig Annan, a man who might be called a new photographer, since he had only appeared before the public as a picture-maker of extraordinary versatility within the last two or three years. Mr. Annan had been, so to speak, cradled among materials photographic, and his every-day work in the studio, and especially in retouching the photogravure plates required in the business of which he is one of the partners, must have had steady influence on his artistic development. He shines equally in landscape and portraiture, showing in both an equal claim to character and individuality. The whole lecture was illustrated by lantern slides from the work of the various photographers spoken of, and the lecturer, while imparting a good deal of solid information, brought in one or two anecdotes which gave that spice which is necessary to make a lecture of this character go with a swing.

Sheffield Photographic Society.—September 7, Mr. G. Tomlinson (President) occupied the chair.—Mr. J. W. Garbutt, of Leeds, gave a practical demonstration on

Lantern Slides by the Wet-collodion Process.

This old method of preparing sensitive plates, which is now very little used, is considered dirty and uncertain compared with dry plates, was worked with ease by Mr. Garbutt, a clean glass being albumenised, collodionised, sensitised, exposed to light, developed, fixed, and toned, and the slide put through the lantern. At the close several questions were asked and answered, and a hearty vote of thanks was accorded Mr. Garbutt. The demonstration was very interesting, and listened to with great attention, by the large number of members present.

FORTHCOMING EXHIBITIONS.

1897.		
Sept. 17–Oct. 13.....	Glasgow International.	W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
October 4.....	Photographic Salon.	Alfred Maskell, Dudley Gallery Piccadilly.
December 9–11	Aintree Photographic Society.	
1898.		
April.....	International Photographic Exhibition (Crystal Palace)	R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COLLODION BACKED PLATES.

To the Editors.

Gentlemen,—Having read most of the correspondence in your columns recently on the above subject, and seeing the difficulty that many workers experience in the subsequent clearing off of a valuable aid in obtaining negatives without halation, I suggest a trial of a very simple and perfectly effective method in my hands. I have not used a large quantity of the red collodion backed plates, and those I have used have been of the smaller sizes; but, after trying to clear the first one by scraping, the idea occurred to me to try one of the powdery kind of soaps, such as Monkey Brand, Sapolio, &c. The trial was quite a success. I took a piece of thick shrunk flannel or woollen cloth, and applied it to the soap, and then briskly rubbed the collodion side of the plate whilst still wet after the final washing. It came off so easily that I was surprised not to have seen the plan recommended before. Perhaps I had better say I am not in the soap trade, or my motive might be misunderstood, which is merely to take advantage of anything obtainable which will secure the object desired, and to aid others to secure it also.—I am, yours, &c.,

L. Scholes.

Eden-terrace, Stretford, near Manchester, September 9, 1897.

To the Editors.

Gentlemen,—As I do not care for the method of obtaining gratuitous advertisement by joining in a correspondence, I refrained from answering Mr. Watmough Webster's first diatribe against collodion backing, even though it concluded with an entirely erroneous statement regarding ourselves; but, as he persists in his assertion that we have abandoned orange collodion, I beg to say that we have done nothing of the kind, and have no such intention.

When our backed plates were first announced, Mr. W. had a few for trial, and some time afterwards wrote us a somewhat warm letter about the difficulty of removing the backing. We replied, regretting that he had had any trouble in the matter, and informing him that, since the first few batches had been issued, our formula had been modified in the direction of making the backing less adherent, so that in future we did not think he would have any further difficulty. Most people would have thought this explanation sufficient, especially as Mr. W. has been a direct customer of ours for many years, and, although by no means an easy one to please, has certainly no reason to complain of any lack of liberality on our part; on the contrary, we have many times gone much out of our way, and taken considerable trouble to suit his convenience; I cannot, therefore, avoid thinking it a little unkind that he should "go for us" as he has lately been doing. But it is said that there are

easons for roasting of eggs," and doubtless there are also reasons for e roasting of plate-makers.

With regard to the merits of orange collodion as an effective backing ere can hardly be two opinions. If authority has any weight, it has en continuously recommended by experts, from Captain Abney, over enty years ago, down to Drs. Vogel and Stolze, in your last issue but one. has one so-called defect, and one only, namely, that it requires removal ter the negative is finished; but, as not only such giddy young things Mr. Henderson and Mr. Maclean, but also such an authority as r. Bolton, unite in declaring that this is a perfectly easy and not ugthy operation, I really cannot think it such a bugbear as Mr. ebster represents, especially as during the last five months we have ld very large quantities of these plates and have had very few mplaints.

Of course, there are both right and wrong ways of proceeding in this in most other matters. The right way is to wait until the negative as been developed, fixed, and completely washed, and then, *while wet*, scrape off the backing (which will have been considerably loosened by ie previous operations) with a piece of glass, knife, or chisel. Mr. olton recommends a cabinet-maker's steel scraper, and I have no oubt this would be about the best thing for the purpose. If this craping operation be done in a sink where water is running, so as to once wash away the pieces of collodion as they are loosened, there an be no difficulty.

It is *not* recommended that platinum prints be afterwards washed in ie same sink while bits of collodion are floating about in it; nor is it dvisable to let the negative dry, and then scrape off the dry film, so as send it in the form of a highly electrical powder all over a room where et prints, bromide or otherwise, are hanging to dry. That the cleaning-ff operation does take *some* time I admit—we have not yet succeeded making it instantaneous; and Mr. Webster says he cannot allow more an two and a half minutes for a 12 × 10 negative! Well, I think it can e done in that time, but I had no idea that even a professional photo-rapher's time was so fully occupied that he could not spare two or three xtra minutes on a 12 × 10 negative for the sake of getting a better result. fancied that on an outdoor negative a good deal longer than this was ometimes spent in dodging development, or afterwards lost in "faking p" a negative which had not turned out quite as well as it might have one if it had been backed.

Mr. W. does not like collodion, and will not have a backing which nakes a mess of the developer, so pins his faith on black paper! Well, *hacun à son gout*, "different people have different opinions—some like pples and some like onions." But we don't care to do it that way.—I m, yours, &c.

WM. J. WILSON.

(*For Paget Prize Plate Company.*)

To the EDITORS.

GENTLEMEN,—I can only say to Mr. Henderson that the article I wrote n this subject was over my own signature, and any one wasting the time f readers of this JOURNAL by contributing matter worthy of being termed idiculous would be guilty of something like impertinence. I quite agree vith Mr. Henderson, that "half an hour's extra labour on a dozen 2 × 10 plates would not be considered when quality should be first;" but t is well known, and proved, that equal quality is obtainable by a back-ng which is spontaneously detachable. No one has a higher opinion of Mr. Henderson's technical skill and knowledge than myself, and this nakes it the more incomprehensible to me that he should be thus content o waste half an hour. And there must further be considered the risk, in arge establishments, of spoiling paper prints through the settling on hem of minute loose particles floating in the air or lodged on work benches.

I thought my challenge was fair, but I alter it as follows: I will supply an unopened packet of one dozen 12 × 10 plates of the brand and manner of backing under discussion. Mr. Henderson, at the next meet-ing of the London and Provincial Photographic Association, can then either soak them in water for ten minutes, or he may place them in any developing solution in ordinary use that he likes, and then fix and wash them; and if, after this, he will, within half an hour's time, remove the whole of the collodion backing without injuring a film, staining it, or leaving any particles of the collodion upon it, or breaking, scratching, or cracking the glass, using any of the methods he has described, or any method reasonably likely to be used in the every-day work of an average studio, I will give a guinea to the Benevolent Society and stand the loss of the plates, Mr. Henderson providing me with fresh similar ones if he fail. "Magna est veritas et prævalebit."—I am, yours, &c.,

G. WATMOUGH WEBSTER, F.C.S., F.R.P.S.

SEPARATE EXPOSURES ON ONE PLATE.

To the EDITORS.

GENTLEMEN,—You are quite correct in saying that Mr. D. Knights Whittome's idea for two exposures on one plate is not new—very far indeed from it. I happen to have one I did just twenty-eight years ago. I enclose it for your inspection.—I am, yours, &c.,

Fort Studio, Margate, September 10, 1897. WILLIAM SCHMIDT.

MR. BRUCE'S C.C. PICTURES.

To the EDITORS.

GENTLEMEN,—The writer of your notice of the Victorian Exhibition must have some curious notions as to the history of collodio-chloride when he talks about Mr. Bruce's pictures having been made on a German make of C. C. paper thirty years ago!

Mr. Bruce was one of the early pioneers of the process, and deserves great credit for having successfully worked, and continually advocated it, ever since, but I am very much mistaken if he has ever, except as an experiment, used any but his own make.

I am writing this away from means of reference, but my impression is that the time during which German-made C.C. paper has been on the market is more like five or six years than thirty!—I am, yours, &c.,

WM. J. WILSON.

CASH WITH ORDER.

To the EDITORS.

GENTLEMEN,—In the JOURNAL for the 6th inst. I see a complaint from "Caveat Emptor" as to the delays he experiences in the execution of orders when he has sent the cash with order. He talks of having to wait "days," but I should be only too glad if I could get my orders attended to after *days* of waiting. The following is the latest of my experiences:—

On May 25 last I sent an order for a couple of gross of plates of sorts to a well-known firm of manufacturers in London and sent the full value plus some twelve shillings wherewith to pay the carriage out to Madras. My letter and the cash must have reached the firm about June 14, and, by the mail leaving London on June 18, they sent me a printed form of receipt. The mail which arrived here to-day from London left there on August 6, but up to now there is not a sign of the plates having been dispatched—so that apparently the firm have done absolutely nothing with my small order from June 18 to August 6, *seven weeks!* The plates are of the commonest sizes and kinds, half-plate 6 dozen; one gross lantern 3¼ inches square, and six dozen stereo transparency plates 6¾ × 3¼. Ought any firm (having received cash with order) to sit down for seven weeks and do nothing? I should think not.—I am, yours, &c.,

F. D.

AWARDS AT THE GLASGOW PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—Judges are not, of course, infallible, nor are unsuccessful competitors always unbiassed critics; but may I be allowed to venture to say that the awards given to the pictures at this Exhibition have, in numerous cases, given more than the usual dissatisfaction?

The exhibits include pictures by almost every famous photographic worker in the kingdom (not to mention various foreign notable men), and yet the great majority of the medals, in almost every class, have gone to one exhibitor, which I think you will admit is a remarkable thing in itself.

I think I ought to know good black-and-white work when I see it; but, looking at the pictures that have failed to catch the Judge's eyes, *and those that have*, it troubles me and many more to understand some of the awards.

Photography, like painting, has many sides; a collector can see beauty in a Whistler just as easily as in a pre-Raphaelite or Sir John Millais, and buys the one as readily as the other.

The Judges here appear to have seen beauty in one school only, and unless the exhibitor belonged to that school his chance was *nil*.

Now I think a good Judge should have no "fad," and I also certainly think he ought not to know the names of the artists whose pictures he is adjudicating upon.

In this Exhibition, if a letter which has appeared in the columns of a daily influential local paper be correct, not only did the Judges know the names of the exhibitors, but members of the Hanging Committee (who were competitors) went round with them on the judging day to point out and suppose any beauty they might easily in some cases have missed. Surely this was very irregular, and a source of heart-burning amongst the unfavoured many who were not allowed to assist on that occasion.

I have had the honour of being asked to judge at various exhibitions, and I can honestly say that neither the other Judges nor myself ever dreamt of asking the name of any competitor until our duties were over. A Judge who requires the name of the artist before he decides on the merit of the picture before him, has, I think, mistaken his vocation.—I am, yours, &c.,

ONE OF MANY.

THE BRIXTON EXHIBITION.

To the EDITORS.

GENTLEMEN,—Will you kindly note in your Exhibitions column that our Seventh Annual Exhibition will be held at the Clarence Rooms, Brixton, S.W., from November 1 to 6 next?

In place of Open Classes, we this year propose to make a strong feature of an Invitation Section, work to be contributed by some of the leading workers of the country, and towards which we have already received several promises of help.

The Judges in the Members' Classes will be, as last year, Lieut.-Colonel Gale and Messrs. Cembrano and Wall. The Exhibition Secretary is Mr. C. F. Archer, of 1, Gauden-road, Clapham.—I am, yours, &c.,

F. W. LEVETT, *Hon. Secretary.*

116, *Loughborough-park, S.W., London, September* 14, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

John Kennerell, 7, York-row, Wisbech, Cambs.—*Photograph of dinner given at Wisbech in honour of Queen's Coronation, June* 28, 1838. *Photograph of dinner given at Wisbech, Queen's Diamond Jubilee, June* 22, 1897.

F. G. Y. (Emperor's Gate).—Call upon us some Thursday or Friday between eleven and one.

STUDIO.—G. COOLING. Better procure Bolas's book on photographic studios, published by Marion & Co.

C. G. A.—We cannot give you the address of any one in Manchester. Mr. Redmond Barrett, 129, The Grove, Hammersmith, W., may be able to assist you. Better write him.

COPYRIGHT.—W. A. P. If a customer brings you a photograph to copy which is copyright, you are not relieved from responsibility. As you are in doubt, make sure the picture is not copyright before you copy it.

HISTORICAL EXHIBITION.—PROVINCIAL. The Exhibition at the Crystal Palace will close, we believe, at the end of the present month. It is well worth a visit when you are in London. The Royal Exhibition opens on the 27th.

LENS.—J. H. B. The lens in all probability is an extremely good one. The largest stop is doubtless *f*-16, the remaining four being 22, 32, 45, 64 (approximately). Print sent shows the negative to have been taken with a good lens.

HAND CAMERA.—We fear we cannot help you, as we are not acquainted with a system involving the use of such numbers for expressing stop ratios. Better arrive at what you want to know by actual measurement—a simple matter enough.

STABILITY.—M. MICHAEL. The use of citrate of potash in the developer for over-exposed negatives is not at all likely to injure their permanence. Whatever may be the cause of the stains making their appearance, you may rest assured that it is not the citrate.

LANTERN SLIDES.—W. BENSON. The white deposit on the lantern slides developed with ferrous oxalate is easily removed by immersing them in water slightly acidified with hydrochloric acid. The deposit is due to the lime in the water forming oxalate of lime.

ENLARGING.—D. THOMPSON. If you are going to enlarge by artificial light from quarter-plate negatives, you will require a five-and-a-half-inch condenser to properly illuminate the plate. Your ordinary lantern will be no good, unless you are content with only the amount of subject included in a lantern-size plate. The long-focus *carte* lens will do quite well as the enlarging lens.

ALUM.—DARKNESS says: "After having toned prints and fixed them, is it a good plan to soak them in alum water to get gloss before you squeegee them? If so, how long in alum water?"—If the prints are treated with alum, the hyposulphite of soda should be thoroughly washed out before the treatment, if permanence be desired. A few minutes' immersion will suffice, and then the alum should be washed out before the prints are dried.

LANTERN SLIDES.—W. S. W. The slide sent is far from being good. When projected on the screen, it will be of the "soot and whitewash" type. This is due to under-exposure and forced development. This slide should have had double, at least, the exposure it did.

FAULTY PRINTS.—DELPH writes: "Can you inform me what is the cause of prints going this nasty brown colour, and what, if anything, would improve negatives of prints No. 1 and No. 2?"—The prints have much the appearance of having been washed prior to toning in water slightly contaminated with hyposulphite of soda. That would account for the unpleasant brown tone. The only way to improve the two negatives is by judicious retouching.

LANTERN SLIDES.—CURATE writes as follows: "Shall I be getting myself into any trouble if I copy the illustrations in the comic periodicals? I think of doing so, and getting up one or two lectures in connexion with them for the winter season."—Yes, certainly, you will be infringing the copyright of the pictures by pirating them, unless you first get the owner's permission. The fact of your pictures being on glass and not paper makes no difference whatever.

PROFESSIONAL PHOTOGRAPHY IN PARIS.—H. H. says: "I write to ask whether you can oblige me with the names of the leading photographers in Paris? I know of Nadar, Reutlinger. I shall also be glad to know whether photographers there employ Englishmen; and, if so, the best way to obtain an engagement. I may mention that I am a retoucher and always have been used to high-class work."—Perhaps one of our friends in Paris will kindly supply our correspondent with the information he seeks.

MOUNTING PRINTS ON GLASS.—ELECTRIC says: "In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897 there is a recipe on page 1023 entitled, 'Mounting Prints in Optical Contact with Glass.' It says 'apply a warm fifty-grain solution of gelatine to the face of the print,' but it does not say how much water. Would you kindly give the quantity of water to the fifty grains of gelatine? Would it do for mounting Ilford P.O.P. in contact with glass."—A fifty-grain solution is always understood to mean fifty grains to each ounce of water. For gelatine papers a weaker solution may be used, say, thirty grains to the ounce of water.

BLUE PRINTS.—WATSON writes: "I am studying the blue process for engineers' plans, but cannot get any colour to remain on the surface. The print looks quite bright till it dries, then it seems to sink into the paper, and appear quite dull. I have enclosed a small piece of one to show you what I mean; could you give me the name of a paper, or the name of a firm that would supply the paper?"—Messrs. Marion & Co., Soho-square, supply a paper for this process, so do all the large photographic dealers. As you do not state the formula by which you prepared the paper upon which the specimen enclosed was printed, we can offer no opinion as to the cause of your failure.

TONING.—No. 6 writes as follows: "Will you kindly settle the following for us? We have a batch, say, of eighty P.O.P. vignetted cabinets. How much chloride of gold to give black tones, quantity of sulphocyanide and water, and how much hypo and water for fixation for the above?"—This is a question that it is impossible to answer, inasmuch as the different brands of P.O.P. are not all of the same character. Some require more gold than others to obtain a given tone, and some contain more or less free silver than others, no two makes being the same. You must use as much gold as will give the tones desired. Do not stint the hyposulphite of soda if you desire to make the prints permanent. Hypo is cheap enough.

FITTING UP A ROOM FOR BROMIDE WORK.—F. E. G. says: "I have a room about 5 feet wide by 12 feet long with large window at north end only; I would like to convert this into a bromide-paper enlarging room for a professional enlarger; will you kindly advise me through your Correspondence column where I can get full particulars as to how best to have it fitted up in modern style for turning out a quantity of work cheaply. The room would also be used for contact printing, lantern slides," &c.—In reply: There is a book on bromide-paper work by Dr. Just (published by Percy Lund & Co., Bradford) which may prove useful. It contains many valuable hints as to apparatus, light, &c. We know of no book or article which exactly fills your requirements. Many useful hints on the subject have, however, appeared in our columns during the last two years.

SPOTS ON COLLODIO-CHLORIDE PRINTS.—P. FRANKLAND writes: "I send you a matt-surface collodio-chloride print, gold and platinum-toned, which shows peculiar spots which I cannot get rid of. Can you account for them? The prints are perfect when washed, but a day or two afterwards this yellowish spot appears, more or less, in all *mounted* or *unmounted* prints without distinction. The prints are most carefully treated as follows: After printing washed in three changes of water (five minutes each change), then toned slightly in a gold bath (acetate soda, borax, and gold) made up just before use; washed twice afterwards, and then toned in a platinum bath made up as follows: plat., 15 grains; pho. acid, 4 drachms; water, 15 ounces. Then washed fifteen minutes, thereafter fixed in a hypo solution of 1 in 20 for ten minutes, and then thoroughly washed in sixteen changes for ninety minutes. Can you say if this spot is a common occurrence with matt-surface collodio-chloride papers? Your ideas on the subject will oblige."—The spots are *not* a common occurrence in collodio-chloride prints. We have never met with them ourselves, and can in no way account for your doing so. We may suggest, however, that the fixing bath you use is very weak, and the time of immersion very short for so weak a solution. Try the effect of a fixing bath of the usual strength. You might send the makers of the paper an example or two; they have, doubtless, had greater experience in its working than we have.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

THE thirty-seventh issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. It is already in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the ALMANAC. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us lists of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the ALMANAC is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

WE publish this week the preliminary prospectus of the great International Photographic Exhibition, to be held, under the auspices of the Royal Photographic Society, at the Crystal Palace, April 27 to May 14, 1898. It will be observed that sections have been arranged for historical photography, pictorial photography, portraiture and general technical photography, apparatus and material, photo-mechanical processes, the scientific applications of photography, photography in colours, and photography as a science. Thus the scope of the Exhibition has been widened out to its greatest extent, and it therefore invites universality of support.

* * *

THE prospectus and regulations have evidently been drawn up with minute care, and we commend their perusal to the whole photographic world at home and abroad. It will be observed that the lines upon which it is intended to conduct the Exhibition give promise of a display in every respect worthy and representative of modern photography. We are sure that the broad-mindedness and catholicity displayed by the organizing committee will meet with general approval, and will attract such a measure of support as will make the Exhibition of 1898 one of the most notable events in the annals of photography.

* * *

INTENDING exhibitors will, doubtless, be glad to know that an attempt will be made to give the opening ceremony the greatest possible *éclat* by securing the services of an important personage to perform that function. Indeed, it is not improbable that His Royal Highness the Prince of Wales may be prevailed upon

to undertake the task. The members of the reigning House have always shown the greatest practical interest in photography, so that the presence of one of their number at the opening of the 1898 Exhibition may be confidently relied upon.

* * *

We are asked to announce that the Annual General Meeting of the Photographic Copyright Union will take place on Wednesday, September 29, at 8 p.m., at St. James's Hall (French Salon). Piccadilly entrance, to which all photographers are invited.

* * *

We congratulate the Great Eastern Railway Company on its latest utilisation of photography for the exploitation of the line. A series of lantern slides, chiefly from Mr. Payne Jennings's negatives, has been prepared to illustrate the peculiar beauty and interest of the district of the Norfolk Broads. The set has been arranged for three separate lectures, illustrating respectively trips from London to Yarmouth and back, to the Norfolk Broads, and on a Norfolk river. Descriptive notes by Mr. W. R. Richmond, and conditions of loan of the slides, can be obtained from the General Manager, Great Eastern Railway, Liverpool-street Station, E.C. Applications should state the set required, and date of exhibition, preference being given to institutes, societies, &c., to exhibit them in London and other districts contiguous to that of the G. E. R.

* * *

A well-known provincial photographer writes us as follows, with reference to a somewhat unpleasant phase of the amateur question: "I have many friends among amateur photographers, and am always willing to help them, but I do not always get fair treatment in return. This week a gentleman called to have two children taken, and explained that he only wanted the smallest number of *cartes-de-visite* he could have (only one, in fact) *as an amateur friend was going to enlarge it for him.* I, of course, declined to take the children under those circumstances, and he went away, mortally offended, to a brother photographer, where a larger order was given. I have more than once found that members (office-bearers, too) of our local Society copy my prints, yet I give them papers or demonstrations three or four times a year."

* * *

In the course of many recent visits to professional studios, we have remarked that there is frequently, on the part of photographers, a strong disinclination to have dealings with amateurs. There need be no surprise at this if the experiences above quoted are at all typical of those met with by professional men at the hands of their amateur "brethren." We suppose it is due to the unpopularity of amateurs among professionals that we ourselves received the only rebuff that has yet been administered to us in a photographer's studio. We were using a hand camera at the seaside, and, desirous of changing our plates, we tendered our card to the young lady receptionist at the nearest studio, with a request for the loan of the dark room for a few minutes. We were met by the information that they "didn't do anything for amateurs there!" Of course, we sought elsewhere for changing accommodation, which was readily granted. Oddly enough, this took place at Great Yarmouth, shortly after the Convention, and the name of the photographer referred to figures in the Convention handbook as willing to grant changing accommodation.

Mr. Duncan C. Dallas, of 5, Furnival-street, E.C., the originator of Dallastype and Dallastint, asks us to draw attention to the fact that he is establishing a school of instruction in those processes, which are applicable to the production of surfaces in relief lines, relief grained half-tone, intaglio grained half-tones, &c. Mr. Dallas claims to be the first in this country to bring photo-engraving into commercial use. In 1854 he was the founder of a company which worked the Pretsch patent under Mr. Dallas's improvements. For colour printing, and for the three-colour process, the Dallastint natural grain is said to have features which render it practically valuable, and also appears to have many advantages for newspaper work, &c.

* * *

The Photo-chromoscope Syndicate, Limited, of 121, Shaftesbury-avenue, W.C., send us a price-list of the kromskop, and kromograms for viewing therein. Of the latter, about sixty are now available, the subjects embracing flowers, crystal, landscapes, copies of paintings, London architectural views, china, &c. The cost of the kromskop is 5*l.*, and the kromograms are 5*s* each. There is no more delightful or beautiful object for the entertainment of the home circle than Mr. Ives's ingenious invention for enabling one to observe objects in the colours and relief of nature itself.

* * *

A revised edition of Dr. Emerson's work, *Naturalistic Photography*, is at present appearing in the pages of our New York contemporary, the *Photographic Times*. Many additions and improvements have been made to the work, which we understand will shortly be published in book form in this country.

DEVELOPMENT AND TONING.

Now that so much of the positive printing work is done by development, both on paper and for transparencies, it seems only reasonable that some little attention should be paid to the question of obtaining satisfactory tones in a single operation, instead of having to resort to special toning treatment. It is true that popular fancy has, during the past few years, taken a decided turn in the direction of black tones which are easily obtained on most of the recognised printing media by the use of suitable developing solutions, but this is probably rather due to the fact that such tones *are* more easily attainable than because they are preferred; in fact, it is perhaps a case of "Hobson's choice." Why, else, do we hear of the constant striving after "warm" tones, both in platinotype and bromide work? and why do the general public still undoubtedly show a preference for the character of pictures obtained with albumen, gelatino-chloride, collodio-chloride, or carbon, rather than developed bromides or platinotypes?

We notice that one of the latest innovations consists in a separate toning solution of alum and hypo for the production of sepia tones on developed bromide prints, and possibly, if the want exists for such tones, it may be a better, and we might say safer, plan to obtain them by legitimate development, rather than by resorting to the use of a separate solution. We do not mean to imply that the tones obtained in this manner may not be quite as permanent as those resulting from pure development, if the operations be carefully and properly carried through; but there is just "the rub,"—how are

ve to know that those conditions have been fulfilled, and that he resulting tones are the ultimate and final outcome of the very complex reactions that ensue on the mixture of sodium hypo-sulphite with alum, and not merely a half-way stage?

We shall, of course, be met by the statement that the separate solution is only resorted to because development pure and simple has failed to give the desired result. To which we shall reply, that probably the field of research, in the direction of development methods, is far from exhausted, and has, perhaps, scarcely been explored. What, in fact, has actually been done beyond ringing the changes on the different developers in existence, and mixtures of them? Practically nothing, and yet the tendency is to go away from development, and seek to attain the result aimed at by other means.

Now, it is a fact well known to older workers than the present generation, that not only do variations in the developer itself bring about corresponding modifications of the general character of the image produced, but that there exist innumerable substances which, while not themselves developers, exercise an important influence when used in conjunction with other agents that do possess the necessary power. To illustrate this we need go no further than the collodion dry plates of the old days, a simple bromo-iodised or bromised collodion plate, sensitised in the ordinary silver bath, washed, and treated with a 'preservative' before drying.

If a number of such plates were prepared in identically the same manner up to and short of the final operation of applying the preservative and were then treated each with a different preservative or "organifier," the probability is that every one would give a different coloured image, even though developed in precisely the same manner. In fact, it is well known that nearly every one of the organifiers formerly in regular use possesses more or less of a distinctive colour character in the image it produces. It cannot be that such simple substances as honey, gum, albumen, or even beer, malt, tea, coffee, tannin, or gallic acid, can exert any sufficiently important chemical effect on the film or the sensitive salt itself to account for the resulting difference in action, so we are forced to the conclusion that the effect is in some way due to the influence they exercise in development, and, if the experiment be tried, such will indeed be found to be the case.

It is well known also to the older school of workers that it was no uncommon thing to make additions to the developer for the special purpose of modifying the character of the image either as regards fineness of the deposit or colour; and such additions have even been used since the advent of gelatine plates, and include amongst the number albumen, gum, sugar, acetate, phosphate and tungstate of soda. The first three were chiefly intended to influence the fineness of deposit, the others the colour.

If the experiments be extended to such substances as tannin, gallic acid, salicylic acid, quinine, and cinchonine, and many of their derivatives, as well as many of the alkaloids, especially those of opium, it will be found that, in conjunction with the ordinary alkaline pyro developer, they almost without exception produce a distinctive tint of image, and this, in nearly every case, corresponds, when applied to a collodion film, with the colour of the image produced when the same substance is used as a preservative. The effect mostly differs somewhat when gelatine forms the basis of the image, but the general statement remains true that each produces a more or less distinct colouration.

There is, however, another circumstance or combination of conditions that does much to influence the colour of the image, namely, the variation of exposure in conjunction with a corresponding adjustment of development to suit it. Thus it is well known that in making collodio-bromide transparencies, warm—even bright red—tones are often obtained by greatly prolonging the exposure and using a correspondingly weak and restrained developer. On the other hand, as frequently as not, this course entirely fails to produce the desired effect, nothing but practically black tones resulting. If the matter be thoroughly investigated, it will be found almost to a certainty that the plates that give the red tones have had a tannin preservative, and have been prepared in such a manner as to be naturally comparatively slow, for a quick plate prepared without tannin will not bear the necessary length of exposure. But the same result may be obtained in a modified manner by adding tannin to the developer or by dipping the plate into a solution of tannin before development or both.

In this connexion it should be mentioned that a weak as well as a restrained developer applied to a very much over-exposed plate tends to the production of warm tones, and, of course, any circumstances, such as the nature of the organifier that work in with it, help. Tannin, for instance, naturally tends to give a warm colour, and is at the same time a powerful restrainer, and with collodion films is particularly adapted for use; but how far the conditions would be similar in connexion with gelatine it is at present impossible to say, beyond that, when used for negative purposes, tannin adds greatly to the density, and considerably slows development.

This reminds us that, some ten years ago, gallic acid was suggested in these columns for the same purpose, namely, to act as a restrainer and give dense images when required, as for process work. We remember being struck at the time by the noticeable brown colour of the image thus produced when viewed by transmitted light, the character being such as would seem to strongly recommend it for positive work.

We do not suppose that positive images—by which we mean positive images on paper, resembling the purple tones obtained with gold—will be obtainable by mere development, though, for transparencies, colours closely resembling gold tones are obtainable by using quinine and its salts; but we have little doubt as to the feasibility of obtaining satisfactory sepia tones. At any rate, the range of materials available for trial is wide enough to afford a prospect of one or other proving useful without having to resort to alum and hypo.

Before concluding, we may mention a circumstance perhaps not widely known, namely, the possibility of combining a platinum salt with the ordinary alkaline developer. Such a combination exercises an undoubted influence on the colour of an untoned print submitted to its action, but how much of the effect is due to real platinum toning, and how much to the mere presence of foreign matter, we do not pretend to say. It is obvious that, as the platinum salt is unreduced by the solution, the deposition of platinum on the print, if it take place, cannot be the result of the action of the developer, but simply the independent action of the salt itself on the silver image. If, then, the developing and the toning actions can be so synchronised as to proceed side by side, and complete themselves simultaneously, there seems to be a possibility of developing and toning in one operation partly printed-out chloride papers, instead of having to tone them separately; but at present, beyond the fact that such a print can be developed to a

purple brown tone in one operation we are not prepared to say that the operation is reducible to a certainty. We place the fact on record, however, and shall probably return to the subject at an early date.

Acetylene Gas.—M. L. M. Bullier, writing in the *Bulletin* of the Paris Chemical Society, describes experiments for lighting purposes with pure acetylene, and with the gas mixed with air, nitrogen, carbonic acid, carbonic oxide, hydrogen, and coal gas, and they prove that, if coal gas cannot generally be replaced by acetylene for all kinds of lighting purposes, its use will, at any rate, be made much simpler by the introduction of these foreign gases, and effects rendered possible that, without acetylene, would be difficult and need delicate and costly apparatus.

Paint for Metallic Dishes.—The use of metallic vessels for various photographic purposes has often been objected to on the grounds of their chemical action upon the contained liquids, while the question of a protecting varnish is usually left to the makers. But it has been put on a fair and easily understood footing by Mr. Max Toltze in a paper read before the Civil Engineers Society of St. Paul's. Though his experiments dealt with paint to be used for outside iron-work, it is evident that what would be beneficial for such purposes would be equally so for photographic utensils. Mr. Toltze's general conclusions were: first, to give the metal a coating of best "boiled oil;" next, to give a coating of best asphalt varnish paint carefully and evenly applied and fairly thick; thirdly, to give, after the lapse of a month if possible, a coating of graphite paint, containing neither benzine, turpentine, nor "dryers."

A Giant Telescope Reflector.—According to a correspondent of the *Philadelphia Ledger*, the Rev. Dr. John Peate, who in March, 1895, commenced the grinding of a huge mirror (of glass) for a reflecting telescope has now completed the last touches in the figuring, and the mirror is now ready for mounting. A most exacting test has been made as to the perfection of its surface, and the result has been highly satisfactory. The huge mirror is over five feet in diameter and several inches in thickness. So far the Doctor has not attempted to silver the surface, but even now its light-gathering power is almost incredible. He writes, 'I can see a common pin and one of my own grey hairs tied round it more than 1000 feet from the mirror across the fields.' When mounted, the observer will be placed at a great height from the ground and examine the object or take a photograph through a side tube which will receive the image in the usual way, from a small reflector at the sky end of the tube. The Washington University will then be provided with a unique powerful instrument for eyework or photographic observation.

Röntgen Rays: their Focus.—Dean Molloy, in the *Scientific Proceedings of the Royal Dublin Society*, gives an excellent plan of localising the point of demission of Röntgen rays. He drives three rows of five slender nails into a deal board 7 inches by 5 inches, and places it at the back of a fluorescent screen. In all positions of the screen, when the central nail pointed to the platinum plate, a black-spot shadow was always produced, thus proving that the source of radiation was in the line of the central nail, and at or about the centre of the plate. By means of a pinhole image, Dr. Molloy was able to show that the size of the radiating source was about a quarter of an inch in diameter, shaped like an irregular, ill-defined, circular patch, coinciding with the point on the plate that first begins to flow when the tube is put in action. *A Rediscovery.*—In the very early days of Röntgen's discovery, it was suggested by us that an excellent method of obtaining a quick photographic radiographic result was to take a photograph of a fluorescent screen picture. At a recent meeting of the Paris Academy of Sciences, M. Porché brought forward as a novelty this identical plan, reminding his hearers of the necessity of screening the camera and plate from Röntgen rays that might otherwise impress themselves on the plate, and possibly throw a shadow of the lens thereon.

Meteor Photographs.—An ordinary camera and lens, especially if the latter be wide angle, giving a flat field, are amply sufficient for securing representations of meteor showers, and it is quite possible that next November may see a large fall on the morning of the 14th. It appears that, two years before the great meteor shower of 1866, a notably large shower was seen by a ship lying off Malta, and also in America on the same morning. Calculating from these data, Mr. W. F. Denning, in the *Observatory*, thinks we are entitled, in view of the coming great shower in 1899, to expect the 1864 group to reach us this year in the morning hours of November 14, though it is likely that there will not be so large a number as was seen off Malta, owing to the bearing of certain astronomical prognostications. Those who were fortunate enough to witness the marvellous exhibitions of these bodies that took place in 1866 will know that such a display as that, when its turn comes round, would need a dozen cameras at work at once, and plates changing every minute, for there were times when the whole heavens were almost one mass of shooting lines of fire.

JOTTINGS.

The Exhibition season has set in with its usual severity. Time-honoured and peaceful Falmouth, according to the destination of most of the awards, appears to have given itself the character of the last great stronghold of the "usual thing;" while Glasgow, where the "unusual thing" is making one of the bravest displays ever seen out of London, seethes with dissatisfaction at the incidence of the medals. What a contrast! I wonder what would have happened if Falmouth and Glasgow had changed over Judges?

The Royal Photographic Society's Exhibition will be informally open by the time these lines reach the eyes of many of my readers. Report has it that the Exhibition is better and larger than its predecessors—better, that is to say, in regard to the general good quality of the work shown. There is nothing of a startling nature; the time, indeed, for that kind of thing in ordinary photography has gone by. No new reputations will be made; very few old ones will be enhanced; there will be no eccentric awards; chagrin among disappointed would-be exhibitors will be keener than usual, and this completes my forecast of the principal features of the Royal Photographic Society's Exhibition of 1897.

An Irish correspondent has sent me a copy of a Belfast newspaper containing a reference to the alleged discovery by a Baltimore physician that an ordinary photograph may disclose the condition of the internal organs when subjected to the action of the Röntgen rays. The absurdity of the idea has been almost universally recognised and commented upon in the newspapers. An exception is found, however, in the case of a writer in the paper sent me by my correspondent. The scribe in question, after quoting a lengthy interview with the Baltimore physician, who claims to have made the discovery that "a photograph is a through-and-through likeness of an individual," goes on to say that "the benefits of this discovery to the medical fraternity can be readily appreciated." He says a man "residing far from a physician can now send in his photograph, have it put through the course of development, and when the last negative is reached showing the internal organs, the physician can proceed to develop each organ separately, and can finally ascertain whether they are diseased or not." I think the Röntgen Society should elect this gentleman an honorary member in recognition of his valuable suggestion.

I ask pardon of my friend, Mr. Lionel Bennett, for having erroneously stated that he was among those who regarded his last year's Salon photograph, *A Telegraph Post*, as ridiculous. I, of course, was under a wrong impression. Still, many of the things that are sent in to the Salon and hung there evidence nothing more than a little playfulness of spirit, and thus serve as compensatory correctives to the forlorn and depressing productions of which the Dudley Gallery is annually made the temporary dustbin; so that

here were grounds for my misapprehension. In quite seriously egarding a photograph which I and others thought was meant as a oke, Mr. Bennett throws away a promising reputation as a humourist, nd sets us the task of accounting for the phenomenon of a simple hotograph being responsible for two sets of absolutely irreconilable opinions of its qualities. I fear that the "artistic temperaent" too frequently deludes its possessors into worshipping productions in which the clear, cold eye of common sense discerns only the ommonplace or the absurd, and thus it is that we have the old and otherwise inexplicable conflict of opinion over the qualities of photoraphs and other works of "art."

To Mr. Paul Coe, of Gloucester, I tender my acknowledgments for his charitable references to me contained in his letter published on September 10. He accuses me of bad taste, but omits to specify my offence; he charges me with profanity, because, I suppose, I made a Biblical quotation. If the latter act constitutes profanity, every writer of the Queen's English is open to the same charge, for the simple reason that the Bible is the principal source from which the English language is drawn. Mr. Coe seems to have a very provincial idea of what profanity is, but he will get the necessary enlightenment on the point if he will refer to a dictionary. In his solicitude for the state of my health, he suggests the opening of a subscription for the purpose of sending me away for six weeks. I should very much like to have such a holiday. Mr. Coe, however, has overlooked the fact that it is etiquette for the proposer of a subscription list to head it with a contribution, not necessarily for payment, but as a guarantee of good faith. Still, it is not too late to supply the omission.

COSMOS.

FOREIGN NEWS AND NOTES.

A New Albumenised Paper.—Drs. M. Jolles and Leon Lilienfeld of Vienna have made a number of experiments to find other substances as vehicles for the emulsification of silver in the manufacture of printing-out papers. Dr. Eder gives some particulars in the *Photographische Correspondenz* of a new printing surface that is being commercially prepared by them. Their experiments have been with the proteids—especially those obtained from maize and other husked seeds—and they have succeeded in making a good, serviceable emulsion paper, which they consider superior to any prepared with gelatine, egg albumen, or collodion. "Phosphalbin paper," or "protalbin paper" are the names under which the new article is likely to be known. The glaze is rather higher than that of albumen, the gradation of the prints is good, and the shadows are deep and brilliant. With Bühler's sulphocyanide of strontium gold bath the tone is a warm purple violet. The paper is not affected by damp, and the surface withstands mechanical injury as well as that of albumen. It will also bear considerable rubbing with wet fingers without detriment to its high glaze. For coating the paper the proteid emulsion is prepared with alcohol, and the prints should be very stable, as the medium does not contain any sulphur.

The Goerz Optical Works.—We learn that this establishment has just given all its workmen a week's holiday, with full pay, and during the time business has been entirely suspended. The popularity of the Goerz lens may be judged from the fact that 300 men are employed by the firm.

Halation.—Dr. Precht recommends, in the *Photographisches Centralblatt*, the use of red tissue paper, which should be prepared by soaking in paraffin oil. It may be kept ready for use between two glass plates. A couple of these sheets should be slightly moistened with a few drops of oil, and pressed into contact with the back of the plate to be exposed. Any other fluid with the same refractive index as glass may be used, for instance, castor oil, or oil of aniseed. The matt surface of the paper is also an advantage, as it diffuses any reflected light.

The Chassagne Process.—The *Apollo* contains some further interesting information concerning the mis-statements that were made when this process was brought before the public. It was supposed that the prints acquired properties of selective colour absorption. The syndicate that acquired the right to use the process commercially made propositions to various firms for the granting of licences; but it appears that only two, Messrs. Anthony & Co., of New York, and Messrs. Unger & Hoffmann, of Dresden, entertained the proposal seriously. Messrs. Unger & Hoffmann stipulated that the whole process should be demonstrated in the presence of experts, who should satisfy themselves of its genuineness and applicability to industrial purposes. This caused difficulties, and it was not until the firm declared that it must decline to proceed further until these conditions were accepted that a demonstration was promised. Early in July a gentleman arrived from Paris with the secret preparations in a locked case, and announced himself as a pupil of M. Chassagne. It was thought by those present at the demonstration that the plates had to be prepared with a mother solution, but to their astonishment the operator declared that any prints could be used. An array of brushes and coloured fluids heightened their astonishment, which reached its culmination when the operator inquired the colour of the lady's dress and hair. Further questions elicited the information that it was, of course, necessary to know the colour to attain the proper effect. The writer thinks the chief point of the process is to be found in what was described by the demonstrator as its principal advantage, "a permeation of the prints by the colours and their combination with the silver image." The mother solution may act as a species of mordant, and enable the dyes to form organic compounds, whereby the colours do not affect each other as they are successively applied. The colours being transparent give intermediate shades suitable to the subject if correctly applied, but this requires skill; consequently the process is not automatic. Needless to say that Messrs. Unger & Hoffmann declined to negotiate further.

Unequal Toning of Collodio-chloride Prints.—The Editor of the *Photographisches Wochenblatt* recommends an inquirer to soak his prints in a bath of equal parts of methylated spirit and water, and then to wash them if they refuse to tone properly. This defect is due to the horny condition of the collodion. The glycerine and soluble salts are present in minute particles in the film, which resembles a sponge. The film contracts with age, and the particles are then driven out and absorbed by the paper. In its horny condition the film will not absorb water, and the dilute alcohol restores it by opening the pores and thus enabling the toning bath to act. Finished prints that have been insufficiently toned may be treated in this manner and further toned in the sulphocyanide or combined baths.

A New Departure at the Convention.—The *Photographisches Wochenblatt* draws attention to the living picture taken this year at Yarmouth, and thinks it is the first step towards the supersession of the group. Instead of the familiar command, "Steady, please!" we may at no distant future become equally accustomed to hear, "A little more briskly, please!"

Grain in Process Work.—Dr. G. Aarland has recently discussed the question of ruled *versus* grained screens in the *Atelier des Photographen*. He agrees with M. Levy that no results worth mentioning have yet been produced with an irregular-grained screen. It is admitted that excellent grained pictures have been produced, but by other means. Dr. Aarland thinks the only way to attain this end is by utilising the grain of a collotype plate. One of the faults of the ruled screen is the loss of half-tone. The substitution of a grained screen would merely mean driving out the devil to make room for Beelzebub. The same defect is inherent in both. Borland published a method of producing grained pictures, of which the following are the leading features: A collotype plate is prepared in the usual way and dried at a low temperature. The exposure is made under an ordinary negative. After washing, the plate is immersed for thirty minutes in 320 parts of water and 4 parts of sulphuric acid. The plate is thoroughly washed and immersed for fifteen to twenty minutes in a saturated solution of alum. The plate is again washed in cold, and afterwards in warm, water, which produces a strong grain. Cronenberg has recently patented a process that differs from this only in the last item, the washing in warm water, which is omitted. Dr. Aarland has also used this process, and draws attention to another, by Bolhövener and Jul. Allgeyer, of Munich, which has been used for printing with letterpress. A collotype plate is prepared with an addition of one part of calcium chloride to each ten parts of gelatine. After exposure under a negative and washing, the plate is rolled up with printers' ink. The strong parts

of the picture, the contours and lines, retain their character, whilst the half-tones are rendered in a fine grain, which may be strengthened, if necessary, by dusting on finest Siberian graphite. Under this grained negative a film of bichromated gelatine is exposed that has been prepared with Cologne glue upon plate glass and then stripped off after drying. This film, after exposure, is developed upon a wooden stand by moist rubbing. In this way the soluble gelatine is removed and a picture in relief obtained. Although a large number of prints may be pulled from such a film, it is preferable to make a metal impression for use in the press.

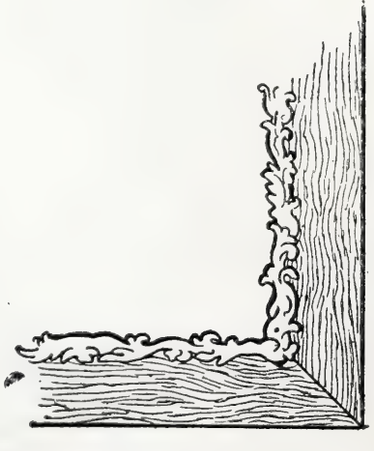
Wanted: A New Name.—The Editor of the *Atelier des Photographen* publishes a letter he has received complaining of the ugly and inordinately long words used in connexion with photo-mechanical work in Germany. Our own are ungainly enough, and worth revising, but they pale into insignificance before such words as "photomechanisches Reproductionsverfahren" and "photo-mechanischer Reproductionstechniker." A distinctive name is required that will comprise all photo-mechanical processes; also one for the worker. It is, of course, preferable that the meaning of a word shall be self-evident, but, where the idea to be expressed is complex, strict adherence to this rule overburdens a language. This is a fault to which our German friends are too prone. After all, a name is but a mark that acquires its denotation by usage. We may thank Röntgen for the want of connotation in the term "X rays," and likewise for its brevity.

Acetylene in Solution.—We also notice in the same paper that Hess has written that acetylene may be held in solution in certain fluids, the same as ammonia in water. Under ordinary pressure acetone will take up thirty to thirty-five times its bulk of acetylene. Under rather increased pressure 250 parts are absorbed, and, if stored in a siphon flask, the acetylene is liberated when the fluid is drawn off. Metal flasks have been manufactured with a capacity of five litres, in which 1000 litres of acetylene may be stored without a large amount of pressure. This is a very convenient method of using acetylene for lighting purposes. The fluid may be returned to the factory and recharged with acetylene.

FRAMING AND MOUNTING EXHIBITION PHOTOGRAPHS: WHAT THE LEADING EXHIBITORS AFFECT.

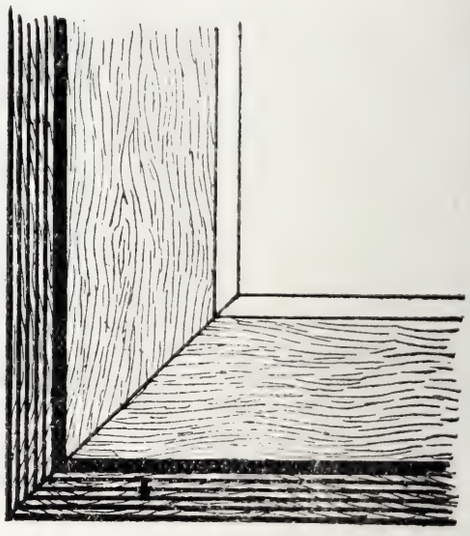
II.

Roses, by Mr. George Macdonald, M.D., $10\frac{3}{4} \times 9$, was a full-bodied warm brown carbon print; frame of polished walnut, measuring one inch in depth, with an ornate inner border of gilt scrollwork, about three-eighths of an inch wide. The print was made up almost entirely of broken curves and detached bits of light and shade, hence the eye



yearned for something which should be firm and restful. The gilt scrollwork, instead of affording that which was needful, added to the unpleasant feeling of confusion in the picture by the irritating insistence of its many twists and twirls, and by suggesting an uncertainty as to where the picture ended and the frame began.

Waiting for the Wind, by Mr. C. F. Inston. The print, which measured $6 \times 4\frac{1}{4}$, was a rather cold platinotype grey, with an inclination to an over-accentuation of scale and contrast as regards light. It is the only one cited which is shown behind a mount. The print was mounted upon a white board, which showed a quarter of an inch; over this was a blue slate-grey cut-out mount, with margins of two and a half inches. The



whole was framed in a plain reeded walnut three-quarter-inch moulding.

The effect of this disposition would be to largely counteract the faulty tendencies noted in the print. The rather severe tone contrast between the white band running round the print, on the one hand with the print's own dark tones, and on the other with the grey mount, is useful in reducing the somewhat over-violent light and shadow of the sky, &c. The cold grey of the larger mount induces a welcome semblance of warmth in the print, which might otherwise impress one as being too cold. The walnut frame gives a touch of warmth to the whole without robbing the print. Note the interaction. The walnut makes the grey mount seem cooler than it really is, which, in its turn, makes the print seem warmer.

Now to glance at some of the frames in the 1896 Salon.

The Salonic Style of Surround.

I shall treat them less methodically, for individual works which have not received the absolute stamp of approval of a competent bench of Judges will not, I imagine, carry the same weight in the eyes of my readers as they otherwise would do. At the same time, many of the most progressive of our exhibitors who are not represented at the Royal are amongst the regular contributors to the Salon. Take Mr. George Davison, whose prints are, in the main, pitched in a low tone; the high lights are about equal in tonality to straw colour; the shadows, on the other hand, are inclined to be blocked, but fail to anywhere reach full intensity. The frames are very heavy, plainly fashioned, deal or similar wood mouldings, stained a very dark olive-brown. Probably this treatment is the best which could be adopted for such prints as those described. Even so, the net result is rather melancholy, and the views strike one as being lacking in force.

Mr. A. Horsley Hinton also goes in for somewhat heavy frames, measuring four or five inches in width; some are stained of a walnut-like hue, in other cases an oak moulding is stained either a dark or a medium pale green; in each instance a gilt inner slip is used.

Mr. A. Burchett's frame and mount round *Ceres* certainly seemed to set off the figure study contained in a sufficiently effective manner. The print was a black platinotype; it was shown under a natural oak-wood mount, having an oval opening, and had a rather wide frame to match the mount. Between the opening in the oak mount and the print was a slip, measuring three-eighths of an inch, of rough yellow cardboard. As already said, the net effect was good, none the less a certain amount of jarring of the optic senses ensued through the conflicting tints of the oak mount and the cardboard slip.

Information regarding the practice adopted by Mr. Craig Annan cannot fail to be particularly acceptable to many, inasmuch as, in the eyes of a considerable proportion of photographers, although by no means all, he is held to stand head and shoulders above his rivals.

Mr. Annan, in the main, favours mouldings which are dark, heavy, and wide. Their colour is usually, but not always, dark olive brown,

with a black slip measuring about one inch in width and perhaps half an inch in thickness, the edge being bevelled and gilt.



B is the black surface, G the gilt, F the olive-brown moulding.

A Lack of Luxuriant Symmetry.

The dominant characteristic of Mr. Craig Annan has always been a striving for innovation; this, from time to time, shows itself in his methods of framing. Never more distinctly has this been the case than with *Eleanore*, which, as if in itself not sufficiently *hors ligne*, was surrounded by a remarkable arrangement, reminding one more of tigers or zebras than suggestive of the "swan-like stateliness" or "luxuriant symmetry" which the doleful numbers of the poet dwell upon.

Although no mere sketch, especially in monochrome, will do justice to this eccentricity, it will give the man at a distance some interesting



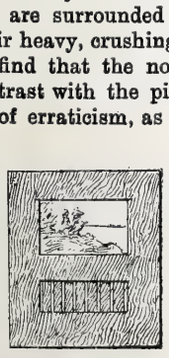
notion. As the diagram indicates, the frame provided at the base of the picture for a special panel in which was written, in white characters, four lines compiled from Tennyson. A large and "insistant" initial letter, illuminated in green, on a red design, completed this portion of the decorative *ensemble*. The frame proper was, in section, something like the appended sketch.

Its ground colour was yellow brown; its striking and rather lavish markings being dark brown.

The whole confection served rather to distract than to hold the attention, those who wished to dwell upon the picture being continually annoyed by the intrusive interruptions of what I, personally, regarded as a loud and aggressive frame.

Since writing the foregoing, an inspection of Mr. Annan's one-man show at the Camera Club reminds me that, besides the *Eleanore* frame, he has, with other works, favoured the striped materials. Thus, at the Club, he showed *San Maria Della Salute*, in which the mount is formed of the afore-described striped wood, and is enclosed by a black moulding.

Other works, as *Sibylla*, are framed in a broad oak, which is only *slightly* darkened and oiled. Those pre-eminent in art usually like extremes, hence no surprise is felt when we find Mr. Annan surrounding some of his photographs with wide, white—dazzling white—mouldings. Jupiter, we know, occasionally nods, and so with Mr. Annan, for certain of his white-framed works certainly seem to be injured by the cold glare of lightness by which they are surrounded; on the other hand, some others are smothered by their heavy, crushingly dark setting. Take, for instance, *Jan*, in which we find that the none too strong shadows are further emasculated by contrast with the pitch black frame; which, by the way, is an illustration of erraticism, as regards form of surround,



that some may like to copy, but which is none the less rather an example to avoid. The frame in question, made of ebonised wood, was something like the appended sketch. Hector Maclean, F.R.P.S.

THE POISONOUSNESS OF PHOTOGRAPHIC CHEMICALS.

[Translated from the *Photographische Correspondenz.*]

As though the regulations respecting the use of poisons were not sufficiently inconvenient and pernicious to the photographic art, a section of our professional journals are drawing the attention of the sanitary police to the poisonousness of uranium compounds. It is, of course, necessary to handle them with care, and no one should think of drinking such solutions. There is, however, ground to fear that the use of photographic chemicals may be further restricted by the alarming pictures some delight to paint, and that at last nobody will have to care for his own well-being, and that everything will be beautifully controlled by the police.

We are moved to these considerations by an excellent article by Dr. H. W. Vogel in No. 387 of the *Photographische Notizen*, which we reproduce, because the question of poisons is treated from the proper standpoint, and with the practical insight and broad experience which characterise this man of learning.

"It is somewhat difficult for the writer to give expression to his opinions on the subject of this article, as he is rather insusceptible to poisons. I remember very well making a bet in my youth (about thirty-five years ago) that I would bite a stick of cyanide of potassium in half,* and I actually won the bet. I then had excellent teeth.

But my task is rendered more difficult by the inertia of the photographic world. The professional photographer of thirty years ago, when scarcely anything was known but the wet process, so constantly used cyanide of potassium that he thought little more of it than he would of soap.

Whoever uses daily so deadly a poison, although he may not actually bite it, thinks he has little to fear from less active poisons. Much also depends upon the individual. I know a photo-mechanical worker who still uses the wet process, and fixes and reduces with cyanide of potassium without feeling the slightest effect, but who frequently is at the point of fainting from the vapour of ether when coating a large plate with collodion.

On the other hand, I know another man who is indifferent to this, but prefers to let his assistant intensify his negatives, since ammonium sulphide gives him a most violent headache.

The celebrated late Professors G. and H. Rose were affected in the same way by inhaling sulphuretted hydrogen. My indifference and Rose's susceptibility to this gas often led to slight unpleasantnesses when I was his assistant.

I know another operator who cannot stand ammonia, which, in dilute condition, is not at all unpleasant to me. It is difficult to write concerning photographic poisons. If, for instance, anybody wrote about the poisonousness of pyrogallic acid, he would be laughed out of countenance in England, where it has been universally used since the time of wet plates.

When the carbon process was introduced into Germany about the year 1867, very serious articles were written concerning the poisonousness of the chromic salts. It was said (and with truth) that many of the workmen employed in the factories where chromic salts were made had lost the cartilaginous partition of the nose, and that they had merely a large hole remaining. But it was overlooked that only certain men were thus affected, that it only occurred when large quantities of chromic salts were handled, and that it was the dust that was so pernicious. There is really nothing to be afraid of with the dilute four to five per cent. solutions of chromic salts used by photographers for sensitising carbon tissue. During my thirty-three years' experience I have not heard of a single case of poisoning from chromic salts.

It may be said broadly that photography has become more healthy since the introduction of the gelatine process. Cyanide of potassium has been completely superseded, and the harmless hyposulphite of soda is now universally used.

It is true that another poisonous compound has come to the fore that was not used in the wet process, namely, bichloride of mercury. This at once became the favourite intensifier for dry plates, because of the facility with which it penetrates gelatine as compared with other intensifiers. I often wonder at the carelessness of amateurs in using this salt in apartments where servants and children might easily mistake it for sugar. But it is remarkable that I have not heard of any accidents with bichloride of mercury in photographic circles.

In the photo-chemical laboratory of the Polytechnic School in this city bichloride of mercury is seldom used. It is a rule to leave the negative in the developer until it reaches "printing density."

Recently instances have become more numerous in which the valuable developer metol has been decried as injurious to health. [Quite true!—Ed. of the *Photo. Corres.*] The fingers swell and the skin cracks; but I have not experienced anything of the kind. However, I do not often use metol.

I do not think it necessary to make any remarks concerning the poisonousness of the uranium salts. The uranium printing process has not caught on, and the uranium intensifier (one per cent of nitrate of uranium) is much too dilute.

There was a great outcry when I recommended aurantia for yellow

* Of course I did not swallow it.

screens. The true story was told of a hundred ballet girls at the Grand Opera in Paris who had suffered from an eruption because their tights were dyed with aurantia. But would anybody use plate glass coated with aurantia collodion for stockings?

Lastly, collodion itself is a poison, notwithstanding that my Polish porters drank it secretly with impunity, as though it were vodky, when I was photographing in the Carpathians in 1871. At last I was compelled to mix some magnesium chloride with a bottle of collodion waste, and leave it for them. The action was most penetrating. They did not drink another drop!"

H. W. VOGEL.

THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION, CRYSTAL PALACE, 1898.

[Reprinted from the Journal of the Royal Photographic Society.]

WE are now able to announce the issue of the preliminary prospectus of the Exhibition which the Society will hold in the spring of next year at the Crystal Palace. Simultaneously with this appears the prospectus and entry form for the apparatus, material, and photo-mechanical sections, which by the nature of the exhibits themselves, require as long a notice as possible of the arrangements.

There is no need to deal at any length with the necessity for such an Exhibition. It has long been recognised as inevitable, and its organization has only been held back by the difficulty of finding a suitable building in which to accommodate the large and varied collection of exhibits without which it could not be regarded as complete. When such a building is sought, the poverty of London in this respect becomes very marked. We are not revealing anything that should not be made known when we say that the Committee were limited in their choice to two possible situations, the Agricultural Hall and the Palace, as the only buildings which provided the requisite accommodation at a suitable time. Small galleries, such as the Grafton Galleries or the Portman Rooms, it was felt would not admit of such a display as was aimed at, while Olympia and one or two other halls were only to be had, either on prohibitive terms or under conditions of a hampering nature.

The Crystal Palace Company has met the Society in a manner which the Council deemed fair and satisfactory, and the Organizing Committee of the Exhibition are doing their utmost to make the 1898 Exhibition worthy of the present position of photography and of the Royal Photographic Society.

We give below the preliminary general prospectus and the final prospectus of the sections already referred to. All communications, requests for information, &c., should be addressed to The Secretary, Royal Photographic Society, 12, Hanover-square, W.

PRELIMINARY PROSPECTUS.

It is proposed to devote the entire nave of the Crystal Palace, together with such other spaces as may be necessary, to an Exhibition of "Photography and its Applications," using the expression in its widest sense. The whole of the arrangements have been placed in the hands of a Committee, the names of the members of which have been given, the Committee having been nominated as to one half by the Council of the Royal Photographic Society, as to the other by the members of the trade and profession at a special meeting called for the purpose.

The Exhibition will be formally opened on Wednesday, April 27, 1898, and will remain open until Saturday, May 14, following. Every exhibitor will receive a season ticket and a copy of the catalogue.

The various branches and applications of photography render necessary the division of the Exhibion into sections, the following being those at present arranged:—

I. The History of photography.
II. Pictorial photography.
III. Portraiture and general technical photography.
IV. Apparatus and material. (Including machinery in motion.)
V. Photo-mechanical processes. (Including machinery in motion.)
VI. Scientific applications of photography. (Including photography with the X rays.)
VII. Photography in colours.
VIII. Photography as a science.

All exhibitors in Sections III., IV., and V., and those exhibitors in the other sections who are not specifically invited by the Committee to lend exhibits, will be charged as follows:—

In the case of exhibits occupying floor space, one shilling per foot for each square foot occupied or reserved. Minimum charge, one pound.

In the case of exhibits occupying wall or screen space, 6*d.* per foot for each square foot occupied or reserved. Minimum charge, five shillings.

Each exhibitor (except those specially invited to lend objects for exhibition in Sections I., II., VI., VII., VIII.) will be expected to bear the cost of carriage of his exhibits to and from the Exhibition and of fitting up the space at his disposal, and of providing attendants where necessary; but the Committee are prepared to undertake the work for provincial, foreign, and colonial exhibitors by special arrangement.

N.B.—The above-named charges will constitute the whole of the liability of the exhibitor towards the expenses of the Exhibition.

I. THE HISTORY OF PHOTOGRAPHY.

This section will comprise early results by the various photographic processes, early and obsolete forms of apparatus, portraits of photographic inventors and discoverers, and other exhibits calculated to display the gradual evolution of modern photography from the earliest discoveries.

It is anticipated that there will be in this section more particularly—

(1) As complete a series as possible of the various forms of lenses, with diagrams of their construction and specimens of work done with each.
(2) Obsolete or superseded forms of cameras and other apparatus.
(3) A Daguerreotype studio in operation.
(4) Examples of early photographic processes, and of processes now obsolete or superseded.
(5) Early examples of photo-mechanical apparatus and results.
(6) Collections of photographs by early workers.
(7) Photographic literature.

N.B.—It is requested that possessors of apparatus or pictures (negatives or positives) of historical interest will communicate with the Committee. There will be no charge made for exhibits under this head, and the Committee are prepared to pay all expenses of carriage on objects accepted by them for exhibition.

II. PICTORIAL PHOTOGRAPHY.

A loan collection will be arranged with a view to display the present position of pictorial photography.

III. PORTRAITURE AND GENERAL TECHNICAL PHOTOGRAPHY.

In this section will be included exhibits of general photography, portraiture, landscape, &c. It is open to all photographers, and it is hoped that many portraitists will exhibit on a large scale in this section, to which a very important proportion of the space available will be devoted. The exhibits will not be submitted to a Committee of Selection, but the Organizing Committee reserve the right to reject any work they consider unsuitable from inferior technique or from any other consideration.

It will include—

(1) Examples of portraiture, landscape, and architectural work.
(2) Specimens of photography produced under exceptional difficulties, or by means of special apparatus.
(3) Transparencies, lantern slides, and enlargements.
(4) Ceramic photographs and enamels.
(5) Illustrations of processes of every kind, including diazotype, ferro-prussiate, and kindred processes for copying drawings, &c.
(6) Demonstrations of various photographic processes.
(7) Models of studios, methods of glazing, studio accessories, &c.
(8) Photography by artificial light.
(9) Methods of printing photographs rapidly and in quantity.

IV. APPARATUS AND MATERIAL.

In this section manufacturers and dealers are specially invited to exhibit. A plan of the area assigned to it and to Section V. will be prepared, and can be obtained at the Society's offices, showing the method of subdivision.

It is anticipated that this section will include—

(1) Apparatus and appliances of every sort used in the production and display of photographs; plates, papers, chemicals, apparatus for coating plates and paper, &c.
(2) Machinery in motion, showing the various processes employed in the manufacture of lenses, cameras, &c.
(3) Illustrations of the work produced by the apparatus and materials shown.
(4) Animated photographs and apparatus for their display.

V. PHOTO-MECHANICAL PROCESSES.

This section will comprise all exhibits relating to the processes classed as photo-mechanical, *e.g.* photogravure (intaglio), line and half-tone photo-engraving, collotype, photo-lithography, photo-zincography, Woodburytype, &c. A plan of the area assigned to it and to Section IV. will be prepared, and can be obtained at the Society's offices, showing the method of subdivision.

It will also include examples of letter-press printing, which includes half-tone work, journals, and books produced part ally by photography, drawings made with a special regard to their being reproduced photographically, textile and paper-staining processes, and photo-mechanical three-colour printing processes.

N.B.—It is hoped that as many as possible of the processes will be actually shown in operation.

VI. SCIENTIFIC APPLICATIONS OF PHOTOGRAPHY.

In this section will be included the various scientific uses to which photography is put.

It is expected that among other exhibits will be—

(1) Photo-micrographic apparatus of the latest designs, photo-micrographs, micro-photographs, &c.

(2) Astronomical photography. The complete mounting for one of the instruments now employed in mapping the heavens. Space will be placed at the disposal of the leading observatories in the world.
(3) Photographic recording instruments and photographic records.
(4) Military photography (including the photography of projectiles, photographic surveying, and balloon photographs)
(5) Engineering photography.
(6) Medical photography, including photography with the X rays.
(7) Subterranean photography.
(8) Meteorological photography. (Clouds, lightning, &c.)
(9) Spectroscopic photography.
(10) Instantaneous photography, applied to the movements of animals and to the phenomena of rapid movement, &c.
(11) Composite physiognomy.
(12) Geological photography.
(13) Metallurgical photography.

VII. Photography in Colours.

This section will comprise colour photographs and apparatus for producing and seeing colour photographs, by whatever method produced.

VIII. Photography as a Science.

In this section will be included examples of results obtained by different experimenters in carrying out scientific investigations connected with photography, *e.g.* examples illustrative of chemical and physical processes and investigations bearing on photography; experimental plates and apparatus employed in devising the various systems of plate speed measurement; a similar collection with reference to the production of orthochromatic plates, &c.

N.B.—The Committee request that the possessors of any objects of interest coming under this heading will communicate with them. There will be no charge made for exhibits in this section, and the Committee are prepared to pay all expenses of carriage on objects accepted by them for exhibition.

Regulations for Exhibitors requiring Floor Space in Section IV. (Apparatus and Material), and in Section V. (Photo-mechanical Processes).

Date of Opening.

1. The Exhibition will be formally opened on Wednesday, April 27, 1898, and will close on Saturday, May 14, 1898.

Charges.

2. The spaces shown on the lithograph plan will be apportioned among exhibitors in these sections at a uniform price of one shilling per square foot, with a minimum charge of one pound.

Applications for Space.

3. All applications for space must be on an attached form, and should be addressed "The Secretary, Royal Photographic Society, 12, Hanover-square, London, W.," and all space must be paid for on allotment. They will be considered in order of priority of application, the first allotment being made on November 1, before which date no application will be dealt with. The allotment will be made by a sub-committee, the members of which will not be interested as exhibitors. It is desirable that early application for space should be made, in order that the allotment may be facilitated.

Arrangement of Exhibits, &c.

4. A certain number of tables will be available, and these the Committee will place at the disposal of exhibitors. Beyond this, exhibitors must pay all expenses connected with the transit, delivery, fixing, and removal of their exhibits, and with the provision of counters, stands, shelves, and show-cases. The Committee are prepared to receive, unpack, display, and return exhibits by special arrangement.

Signs and Handbills.

5. All displayed signs, notice boards and bills, and all hand-bills and printed matter for distribution shall be subject to the approval of the Committee.

Subletting.

6. No exhibitor will be permitted to transfer or sublet any part of his space, nor to allow any other than his own duly admitted exhibits to be placed thereon, without the consent of the Committee.

Catalogue.

7. The Committee will compile a catalogue of exhibits, which will be as far as possible descriptive and illustrated.

Dates.

8. Exhibits can be received at the Palace on or after April 12. The last day for the reception of exhibits is Saturday, April 23, and all exhibits must be removed between Monday, May 16, and Thursday, May 19, both days inclusive.

Protection.

9. Reasonable care will be taken to protect exhibits, but neither the Crystal Palace Company nor the Royal Photographic Society will be responsible for any loss or damage arising from fire, accident, or from any other cause.

Report and Awards.

10. The Council of the Royal Photographic Society are making arrangements for an independent report upon the Exhibition, but no awards will be made.

Dangerous Exhibits.

11. No substance of a dangerous or explosive nature can under any circumstances be exhibited.

Sales.

12. Orders for goods may be taken, but no goods shall be delivered at the Palace itself other than photographic books or periodicals.

Lighting and Water Supply.

13. Arrangements may be made with the Crystal Palace Company for the supply of current for special lighting purposes, and for a water supply for demonstrations, &c.

Photographing.

14. Messrs. Negretti & Zambra hold a concession from the Crystal Palace Company which gives them the sole right of taking photographs for sale in the Palace and grounds, but such concession will in no way interfere with exhibitors desiring to demonstrate any photographic process and operation, provided that photographs taken in the Palace or grounds are not sold and do not include any part of the building or grounds.

Admission.

15. A non-transferable admission ticket and a copy of the catalogue will be supplied to each exhibitor. In these sections admission tickets will also be supplied to attendants where necessary. These tickets will pass the holder into the Palace without payment on each day of the Exhibition.

Machinery in Motion.

16. Exhibits which include heavy machinery in motion will be displayed in the western galleries, immediately adjoining the entrance from the High Level Station.

General Conditions.

17. All exhibits are subject to the approval or rejection of the Committee, and all exhibitors must conform to the regulations of the Committee.

ON THE PREPARATION OF PRINTING-OUT GELATINO-CHLORIDE PAPER.

[Photographische Correspondenz.]

Gelatino-chloride paper for printing out was first prepared by Obernetter, of Munich, in 1886; and, later, by Stolze, of Berlin, and Liesegang, of Düsseldorf. There are now a very large number of makers, both in England and Germany, who make good Aristo paper, which, in consequence of the brilliant prints which it gives, and the freedom of the film from sulphur, the great permanency of the prints, and their less liability to damage, has found greater preference over all other papers with many amateurs and professionals.

Whilst the preparation of a collodion paper is very simple—and a photographer who is at all accustomed to coat wet-collodion plates can easily make the emulsion and coat the paper; the preparation of the gelatine paper is not so easy, and requires much greater manual dexterity on the part of the operator. The preparation of this paper on a large scale is far easier and much more simple, as machines very similar to those used for coating plates are used for coating the paper. The use of a machine has the advantage of giving a much more even film, and using up the last of the emulsion; but, on account of their high price, they are, as a rule, beyond the reach of the professional who desires to coat his own paper.

The raw paper, which is used for the preparation of gelatine paper, is the same as is used for collodio-chloride—a Baryta paper prepared with an organic (citric) acid, the surface of which, according to the desired result, is highly polished or matt. In the experiments hereafter described I have used the Baryta paper, prepared by Benecken, of Löbau, Saxony, and have obtained excellent results with it, and can, therefore, only recommend this.

Numerous formulæ will be found in the technical journals for emulsions for preparing this paper, especially in the English journals. Many of them only show very small differences, which may possibly be ascribed to errors in the conversion of the English into the metric weights and measures, whilst others show striking differences. The most thorough

investigations on the action of the various ingredients of such emulsions were published by Ashman & Offord, who systematically tested the influence of the various silver compounds, such as chloride, citrate, oxalate, tartrate, lactate, tungstate. Ashman & Offord found, like Abney, that emulsions which only contained gelatine and silver chloride gave papers that kept well, but which gave thin, flat prints if there was not a considerable excess of silver nitrate present, and worked slow, whilst the presence of organic acids in the emulsion resulted in the formation of much more vigorous and more brilliant prints.

Ashman & Offord also proved that all organic acids were suitable for this purpose. They gave formulæ for emulsions which contained chloride, citrate, tartrate, or oxalate of silver. In order to obtain some idea of the value of the directions given in the many formulæ, a series of experiments were made at the K K Lehr u. Versuchsanstalt, at Vienna, and the accompanying table contains the composition of the various emulsions reckoned to 1000 parts of the solvent, in order to compare them.

Ingredients.	Abney, Instruction in Photography, 1884.	Henderson.	Starnes.	Barker.	Leaper.	Guyaux and A. Jorssart.	Burton.	Wade.	Wade.	Boadle.	Ashman and Offord.	Ashman.	Ashman.
Silver nitrate	51	10	10	32	16	13	10	32	60	37·5	32	58	30·6
Gelatine	54	115	69	136	532	100	60	96	62·4	112	71	57	126·8
Sodium chloride	13·5	1·2	1·4	...	...	...	...	..	16·8	...	...	...	...
Lithium chloride	...	..		...	2·3	...	...	...	...	...	...	..	...
Ammonium chloride	...	...	...	2·9	...		2	2·4	...	3·5	5·2	5	4·2
Strontium chloride	...	..	...	...	...	3	...	...	...	..	...	...	...
Tartaric acid	...	...	...	...	2·3	...	...	...	...	...	...	...	4
Rochelle salts	...		...	5·9	..	...	...	2·4	...	5	...	...	...
Citric acid	8·5	...	...	8·1	...	6	4	15·6	2·4	20	slight excess	...	slight excess
Sodium citrate	...	1·6	1·2	...	...	...	...	...		...	...	...	...
Potassium citrate	15·5	...	...	...	...	...	...	...	16·8	...	...	...	...
Ammonium citrate	..	...		...	...	...	...	...	...	...	1·8	...	15
Sodium acetate	...	2·6	2·7	...	...	...	...	...	...	...	...	...	...
Ammonia	...	...	...	...	..	8	...	...	...	...	...	...	...
Alum or chrome alum	0·6 chrome	...	...	15	..	..	...	5·2	1 chrome	5	...	...	...
Potassium oxalate	...	...	...	...	...	...	...	...	...	...	...	24	...
Kind of printing	vigorous	Rather flat	rather flat	vigorous	very flat	rather vigorous	flat	vigorous	vigorous	vigorous	vigorous	vigorous	vigorous
Gradation	15	10	15	14	18	12	9	12	15	16	15	14	20
Sensitiveness. Albumen paper = 1	2·5	0·4	1·8	1	1·5	2·5	0·1	1·8	7	1·8	2·5	1	10
Keeping power	0	0	0	1	1	less than 1	0	1	less than previous	1	1	0	0
Colour of the prints	dirty violet	yellowish-brown	yellowish-brown	red-brown	lilac	reddish-purple	brick-red	reddish-purple	purple-brown	brick-red	reddish-purple	reddish	reddish-brown
Toning in the sulphocyanide bath	unequally	spotty, slow	spotty, slow	good	slowly, pale violet	equally	spotty, badly	quickly, equally	inclined to spottiness	good	slowly, unequally	spotty	good
Combined toning and fixing	good	good	good	good	good	good, quickly	spotty, unequally	good	good	good	spotting unequally	spotty, unequally	good

The tests made with these emulsions, and also later experiments for the preparation of a gelatine emulsion which should give useful and durable results, resulted in the following conclusions:—

Of the chlorides the most suitable are ammonium, sodium and strontium chlorides; on the other hand, lithium chloride, which is frequently used with success for collodion emulsion, is useless, as it gives very great range of gradation, but very flat prints of a lilac colour which tone badly. The use of barium chloride presented no special advantage, and for this reason I discarded its use, as well as that of sodium and strontium chlorides, and used ammonium chlorides.

The proportion of the silver nitrate in the emulsion is dependent, to a certain extent, on the quantity of gelatine; the more gelatine the thicker the film obtained, and therefore the less the amount of silver nitrate required in order to obtain prints of the necessary vigour. On the other hand, it should be noted that a certain limit of gelatine should not be overstepped if the use of the paper is considered, and that a certain excess of silver nitrate must not be exceeded if the paper is to keep.

In my experiments, having assumed that a certain quantity of silver nitrate was necessary, I found that the best proportion of gelatine was three times the amount of silver nitrate for a glazed chloride paper, whilst it will be seen that the quantities differ enormously in the table.

Of the various organic acids, acetic, whether free or in the state of acetates, affects the keeping power of the paper more than any other, and is therefore unsuitable for the preparation of a paper that will keep. Free citric acid increases the keeping power, but lowers the sensitiveness. It is, with corresponding proportion of silver nitrate, the best thing to increase the brilliance of prints and to produce good keeping paper; for the above reason, however, a certain limit ought not to be overstepped, or otherwise one of the chief advantages of gelatino-chloride paper will be destroyed. Citrates act favourably when sensitiveness and vigour are the main points.

Tartaric acid acts like free citric acid; the prints are brilliant and the range of gradation is increased without the sensitiveness being lowered as when citric acid is used.

Based on the results I have obtained, attempts were made to prepare a good-toning and good-keeping gelatino-chloride paper, which should satisfy the requirements of practice, and which should tone regularly, both in the sulphocyanide and combined toning and fixing bath.

For the preparation of glazed chloride paper for negatives of normal density, I use the following emulsion:—

I.

Silver nitrate	32 parts.
Citric acid	8 ,,
Water	160 ,,

II.

Gelatine	96 parts.
Ammonium chloride	2·8 ,,
Water	700 ,,

III.

Tartaric acid	2·8 parts.
Sodium bicarbonate	1·4 ,,
Alum	2·8 ,,
Water	140 ,,

The silver nitrate should be dissolved in hot water, the gelatin allowed to swell in the above quantity of water, then melted, and th chloride added. The tartaric acid should be dissolved in the water, the the soda added, and, finally, the alum.

Solutions II. and III. should be mixed at a temperature of from 50° t 60° C. No. I. solution, heated to the same temperature, should be adde by yellow light in small quantities to the mixture with constant stirring The emulsion thus obtained should be kept for some time at a tempera ture of 40° to 50° C. to ripen, and then filtered through glass wool b means of a hot-water jacketed filter, and placed in a warmed dish, th size of which should be as large as the sheet of paper to be coated. Th air bubbles that form should be carefully removed with a piece of card and the sheet of Baryta paper floated on the emulsion, and then carefull drawn over the edge of the dish, and, when set, hung up to dry. Wit correct manipulation, sheets free from defects will be obtained. Dryin will be complete in half an hour, and the paper should be cut up to th required size. The best method of keeping the paper is to pack it fac to face, and to lay between the two sheets a sheet of tissue paper soaked i weak citric acid solution and well dried, and then to pack in black pape and lightly press.

Matt papers require an emulsion somewhat poorer in gelatine and the use of a suitable raw paper. The proportion of gelatine for this emulsion is 80–90 parts instead of 96. The preparation is the same, only it is much more difficult to prevent air bubbles when worked as described above.

Prints on the paper prepared as above show a purple-brown colour, and are very vigorous and brilliant. The paper is four times as sensitive as ordinary albumenised paper, and shows a range of gradation of 16 to 17°, and approaches albumen paper in its power to render the finest gradations of tone, and tones quickly and evenly in the ordinary toning and combined baths.

As toning baths, may be used, for example, the following sulphocyanide bath:—

A.

Fused sodium acetate	40 parts.
Solution of chloride of gold (1:100)	100 ,,
Distilled water	1000 ,,

B.

Ammonium sulphocyanide	40 parts.
Solution of chloride of gold	190 ,,
Distilled water	100 ,,

The solutions should be kept separate, and, before use, mixed in the proportion of A 50, B 50, water 100 parts. For a combined toning and fixing bath the following may be used:—

Hyposulphite of soda	200 parts.
Lead nitrate	10 ,,
Water	1000 ,,

Before use, to 100 parts of this stock solution should be added 5 parts of a 1 per cent. solution of chloride of gold. When used once, this bath should be thrown away.

The prints should be washed in frequently changed water, and, if possible, in running water, and not too long; half an hour in running water, or one hour in water frequently changed, is enough.

The paper, prepared with the above-described emulsion, prints four times as quickly as albumen paper, and has a gradation very close to the same, and, as regards the character of the negative, as well as the range of tones, which are obtained with the separate and combined baths, is very similar, so that the professional photographer who still prefers albumen paper, will be very pleased with this, I think.

Most amateurs at the present time prefer papers which give good results even with flat negatives, such as commercial collodion papers, which frequently show a short scale of gradation and sharp contrasts between individual tones. Experiments were, therefore, made to increase the brilliancy of the above normal emulsion, and, on the other hand, to shorten the gradation, so that negatives, which would only give flat and weak in contrast prints on albumen paper, should give brilliant prints on it, and with very satisfactory results. It has already been pointed out that chromic acid or bichromates added to the emulsion gave the desired result.

The action of this addition is far more energetic than with collodio-chloride and silver emulsion; and, as a result, small additions of the chromates are required, and the paper does not show any orange-yellow colour as with the collodion papers.

In order to determine the quantity of chromate necessary to give the same characteristics as the commercial collodion papers, and suitable for strongly fogged or very thin negatives, the following experiments were made:—

To 100 parts of the normal emulsion, of four times the sensitiveness of albumen paper and a gradation of 17° on Sawyer's scale photometer, were added 4·0, 1·2, 0·8, 0·4, 0·2, and 0·1 parts of a calcium bichromate solution corresponding to ten per cent., $Cr\ O_3$; and strips of paper prepared with these emulsions exposed under a number of scale photometers in comparison with albumen paper.

The results were as follows:—

Calcium bichromate solution (ten per cent., $Cr\ O_3$) to every 100 parts of emulsion.	Gradation.	Sensitiveness. Freshly silvered albumen paper=1.
4 parts.	about 3°	$\frac{1}{120}$
1·2 ,,	,, 3°	$\frac{1}{112}$
0·8 part.	,, 3°	$\frac{1}{90}$
0·4 ,,	,, 6°	$\frac{1}{34}$
0·2 ,,	,, 8°	$\frac{1}{11}$
0·1 ,,	,, 10 to 11°	$\frac{1}{7}$

An addition of 0·1 parts of chromate solution gives a printing out paper which gives brilliant prints from negatives which even print flat on collodion paper, and it shows no orange colour, but only a yellowish film.

If it is desired, however, to use papers similar to most of the commercial collodion papers, it is sufficient, as further experiments showed, to add 0·05 parts of the above calcium bichromate solution, or less, to every 100 parts of the normal emulsion. E. Valenta.

THE RADIATION OF LIGHT IN THE MAGNETIC FIELD.

During the past few months some interesting experiments have been made regarding the partial polarisation of radiations emitted by certain luminous sources when they are placed under the influence of a magnetic field. Important investigations in this direction have been made by Dr. Zeeman, of the University of Leyden, says *Nature*, who has shown that the perturbations experienced by the ions, under the influence of magnetic forces, produced new periods of luminous vibrations. Continuing this work, Messrs. Egoroff & Georgiewsky (*Comptes Rendus*, April 5, 1897), with the aid of a Rowland grating and a Ruhmkorff coil, have observed a feeble broadening of the lines, D_1 and D_2, in the spectra of both axial and equatorial radiations. In investigating the appearance of coloured flames of polarised rays by using the Savart analyser, it was observed that the partial rectilinear polarisation of rays directed towards the equator of the magnetic field was easily observed, not only in flames of sodium, lithium, and potassium, but in induction sparks between magnesium electrodes. In the cases of carbon, aluminium, mercury, zinc, bismuth and iron, the Savart analyser showed no indication of rectilinear polarisation. In a second communication to the same journal (*Comptes Rendus* for May 3), the results there enumerated may be summed up as follows. The relative quantity of equatorial radiations emitted by a sodium flame, and polarised rectilinearly, varies with the intensity of the magnetic field according to a particular curve. Under the influence of a magnetic field of given intensity, the quantity of the light polarised rectilinearly, and emitted equatorially by the sodium flame, varies with the temperature of the flame. In studying the change of spectra of metals in a field of considerable intensity, a modification of the method of procedure was adopted, and resulted in the discovery of the rectilinear polarisation of the equatorial radiations. Nearly all the metals employed—namely, Cu, Tl, Zn, Cd, In, Mg, Ca, Ba, &c.—showed polarisation exclusively for those rays that are easily reversed. The phenomenon, the authors state, "is observed in a very instructive manner for the copper in the green part of the spectrum (the change is very large for the ray 5105, most feeble for 5153, and zero for the long waves, 5217 to 5292). For indium, the change only occurred for the violet ray at 4510, while the others (6193, 5230, 5900, 4680, 4616, and 4638) were not influenced by the field at all." In experiments with Geissler tubes containing hydrogen and helium, no definite results up to the present have been obtained.

In the experiments just referred to, it may be mentioned that all the observations were made with the eye. It would, however, be interesting to inquire whether the photographic plate would register these small variations, for then we should have a permanent record of a phenomenon which is not so very easy to observe, or which, at any rate, might be subject to "personal" error. The application of photography to show such effects has been accomplished by Mr. Alexander Anderson, assisted by Mr. Adeney. They employed a Rowland grating of 21·5 feet radius, and obtained photographs of the cadmium spectrum, the source of light being a spark between cadmium electrodes from the secondary of a large induction coil. Mr. Anderson's account of his experiments is briefly summarised as follows:—

"Three lines are very distinct in all the photographs, namely, those of wave-lengths 5086, 4800, and 4678 tenth-metres. Photographs were taken, both without and with a magnetic field, the time of exposure being exactly the same in both cases. This field was produced by a large electro-magnet excited directly by a dynamo giving a pressure with open circuit of seventy volts, the flat poles of the electro-magnet being covered with ebonite, so that they could be brought very close to the cadmium electrodes without interfering with the sparking. The field thus produced was practically uniform, and its intensity was found to be about 17,000 C.G.S. units."

In the first photographs the slit width was about ·001 cm., but in the later photographs about twice this width was used. An examination of the photographs showed that there was no evidence of any effect of the magnetic field, though the definition of the lines was all that could be desired, namely, very clear and sharply defined. When it be remembered "that a length of one centimetre in the photograph corresponds to a change of wave-length of twenty-six tenth-metres, and since an increase of breadth of a line of one-tenth of a millimetre (and probably much less than this) could easily be seen on the photographs, there could not have been a change in the period of oscillation of as much as one part in 20,000."

To account for this negative result, Mr. Anderson suggests two possible reasons: viz., that perhaps the magnetic field was not of sufficient intensity, or that the exposure (thirty minutes for the narrow slit) was

not long enough. He states, however, that, with an eyepiece in place of the camera, he "saw (or fancied he saw) a widening of the lines."

The whole phenomenon of the widening of the lines in the spectra of metallic substances in a magnetic field is, however, of great interest to both physicists and astro-physicists, and it is important that both eye and photographic results should be obtained when possible.

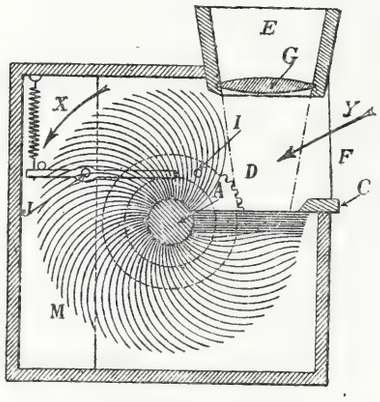
"THE KINORA"—VIEWING ANIMATED PHOTOGRAPHS DIRECT.

Messrs. Lumiere have devised an arrangement for the direct viewing of chrono-photographic or zoetropic pictures; it is characterised by a new method of succession of the pictures.

The successive pictures of an animated scene, obtained by Lumière's cinematographe, or by analogous apparatus, are cemented on cards, M, or other elastic opaque supports, to which a curved form is given, the picture occupying the concave side. These cards are then mounted in the order of succession of the pictures on a shaft, A, around which they radiate in every direction, being firmly fixed at their base by the pressure of two discs, B B, or by other suitable arrangement.

If the wheel thus formed is caused to turn in the direction of the arrow, X (fig. 1), and at the same time a stop, C, entering slightly the circumference of the wheel, is fixed slightly above the centre, the cards

FIG. 1

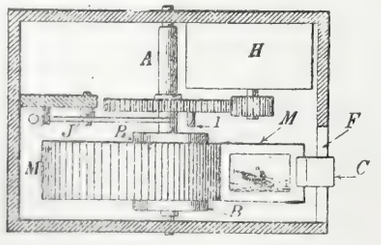


detained by the stop will be straightened out, and become flat and nearly radial, as shown in fig. 1, at the same time leaving an empty segment, D.

The rotary motion continuing, the cards thus stopped will escape one after the other at regular intervals, and will rapidly traverse the empty segment, again assuming their original curved form consequent on their elasticity. The distance to which the stop, C, enters is regulated so that the empty segment, D, shall allow the picture on the last detained card to be viewed through the opening, E, which picture is illuminated by daylight or by artificial light entering in the direction of the arrow, Y, through the side opening, F, of the box containing the apparatus.

The observer, looking through the opening, E, will therefore see successively the pictures in a state of complete rest, the successive visions being separated from each other only by the exceedingly small space of time occupied by a card traversing the segment, D. Inasmuch as the edge of the card, which is escaping from the stop, C, cannot

FIG. 2



exactly coincide with the edge of the next card to be detained, the stop, C, can be lowered near to the line passing through the centre of the shaft, A, so as to render this difference so slight that the eye can perceive no lateral movement in the succession of the two pictures.

The back of each card as also the parts not covered by the picture are blackened in order to avoid all radiation of light during its passage across the field of vision. The opening, E, can be provided with a lens, G, to magnify the pictures, and with any other known arrangement for assisting observation.

The wheel might be formed of flat cards radiating from the centre of the shaft, A, but in such case the stop, C, would curve the pictures at the moment of vision; this is why it is preferred to curve the cards previously, in order that they may be presented flat during observation.

As the wheel makes only one revolution, or part of a revolution, during the viewing of a scene, it moves at a very moderate speed; it can be put in motion by hand, by intermediate gearing, or, better, by a spring motor placed at H (fig. 2).

It will be easy to stop the motor at the end of a scene by means of a stop, J, in position to act against one or several pins, I, conveniently placed on a wheel carried by the shaft, A.

The wheel will be again set in motion by raising the stop, J, which will give a renewed exhibition of the same scene, or will exhibit the following scene on the same wheel. This very simple arrangement enables the apparatus to be readily rendered automatic by the introduction of a piece of money into the box, which piece, having only to liberate the mechanism, stops of itself at the end of the scene.

Very long scenes, or different scenes, visible in succession, may be reproduced by this apparatus, either by replacing the shaft, A, by a drum of sufficiently large diameter, or by arranging the cards around the axis helically, and causing the shaft to advance progressively in proportion as it turns, or again, by mounting the cards upon an endless belt, passing over two or more drums.

IMITATION PHOTOGRAPHIC PRINTS: SOAR AND COOPER'S PROCESS.

Messrs. Soar & Cooper point out that heretofore, in producing photographic prints upon paper or other support coated with a metallic salt, recourse to the action of light has invariably been the method of procedure. According to this invention they obtain similar prints by an entirely different method. The property possessed by various metals to darken other bodies of a metallic nature by deposition when brought into chemical union has suggested a means of forming such prints.

In this process the printing surface, like lithography, to which it is somewhat analogous, is formed flat or but slightly recessed. Part is bare metal—or with but a slight pervious covering as thin, porous gelatine—to form chemical attraction with metallic salts held in, or on, a support such as paper. Part is covered with an impervious resist of varnish, hardened gelatine, or other substance which prevents chemical combination between the metallic bodies.

The first stage is to obtain such a plate of the matter to be reproduced, which can be either of a sketch, writing, drawing, photograph, type, or other print separate or combined.

By one or other of the photo-engraving, lithographic, or appertinent methods, a print is made to form a protecting surface corresponding to the whites of the picture which they are reproducing on a metal plate, such as zinc or copper in line, stipple, half-tone screen, or for intaglio etching, it being only necessary for Messrs. Soar & Cooper's purpose to carry the process to the point when the plate is prepared ready for the etching bath, the print being made from a positive or transparency of the original matter, as in photogravure, thus leaving bare only such parts of the metal which for a type-block etching process would be covered with a resist, enabling the necessary reaction to be set up when brought into contact with the metallic salts. Obvious means can be resorted to, allowing such a print from a negative or for a transfer to be used. A resist likewise is obtained by drawing, with a gelatinous substance, or by making a print by bichromate, or kindred printing processes, either upon glass or suchlike support, or one is transferred to a substance of an impervious but not of a metallic nature. The non-metallic material is the resist, the print whilst damp being then dusted over with bronze, or other suitable metallic powder, to form the affinity, or a solution of metallic salt or salts is applied to it, or a metal in a fine state of powder incorporated with the substance composing the print or the drawing where available, the metals used being such as those mentioned in the context.

Further, they engrave, or otherwise cut through, a resist coated upon a metal plate, or use ordinary metal type or type blocks for the printing surface. Any known process of making or obtaining such a plate as here shown can be utilised, according to the convenience of the method to the results required.

Their next proceeding is to incorporate in, or upon, one or both sides of a suitable paper fabric, or other support, as, for instance, the ordinary photographic papers, a metallic salt. This they do by any of the usual means employed for coating such papers or other supports.

The salts used are those having the property of forming a coloured deposit when brought into chemical affinity with the metal of the aforementioned plate—such as silver nitrate. A support holding such salt, and prepared similar to the photographic silver-printing papers upon the market, can be used, the general formulæ of which are well known. They prefer, however, to adopt one containing gelatine, into which the salt or salts are incorporated in the manner of making emulsions for

gelatino printing-out paper. For guidance they give the following formula, which forms prints resembling the ordinary ones obtained by exposure to daylight. Gelatine, from 20 grains; silver nitrate, 10 grains; water, 1 ounce (with or without citric acid, from 10 grains to be used if the paper is to be kept). To which may be added, either to the emulsion or the damping water as described later, such salts as gold chloride from 1 grain, or ammonia citrate of iron from 15 grains to the ounce of water, although most of the prepared printing papers used in photographic printing are available without any or with but slight modification.

The support holding the salt or salts is damped by floating upon a bath containing water, or by other convenient means, and placed upon the plate or otherwise brought into contact with it, pressure being obtained either by hand or mechanically. The act of union between the chemicals brought into combination, causes by substitution and reduction a coloured metalline deposit to form upon the surface of the support wherever the two come into chemical contact, thus forming the desired print.

These combinations can be varied by adding other salts to the emulsion containing the silver nitrate or its equivalent, or to the damping fluid, such as the chlorides of gold and platinum, or salts of the common metals can be added, as ammonia citrate of iron, *ut supra*, which alter the composition and colour of the deposited print. Other changes occur by varying the metal of the plate employed, lead, iron, nickel, and other metallic substances besides those previously mentioned being available.

Nothing now remains but to fix out the salts unacted upon by the usual methods, and wash the support. At this stage further combinations altering the tone are to be obtained by brushing, or otherwise bringing into chemical attraction with the deposited metallic print solutions of salts of metals such as those before noted, which have the power of uniting with the original deposit.

Our Editorial Table.

Beautiful Cleveland.

By Q. T. Half-tone Illustrations from Negatives by Dr. Stainthorpe and others.

Middlesborough: Hood & Co., Limited.

The most picturesque features of the Cleveland district are sympathetically described in this handsome book, which contains over a hundred half-tone illustrations engraved, from specially taken negatives, by the publishers. Paper, printing, and get-up are admirable, and, as a guide to the natural attractions of North Yorkshire and South Durham, the book deserves to achieve a success as great as its many merits are marked. We cordially recommend *Beautiful Cleveland* to the seeker after the less frequented picturesque.

Portable Photographic Studios and Dark Rooms.

E. C. Walton & Co., Muskham, Newark.

Messrs. Walton, who manufacture portable buildings for horticultural and a variety of other purposes, also make a speciality of studios, specially built for photographic use. The illustration shows one of these studios, which is constructed of the best 3 × 2-inch framing. The sides and ends are covered on the outside with ¾-inch planed, tongued, and grooved boards. The roof is partly of glass which can be had of what proportion desired at no extra charge. If



no special instructions are given, Messrs. Walton make about one-third of the roof glass, the remainder is lined with matchboard, and covered with patent felt that requires no tarring. The floor is of ⅞-tongued and grooved boards, on 3 × 2 inch or 4 × 2 inch joists. Panel door with rim lock and brass fittings; sash made to open in roof or side as desired; ornamental barge boards, finials, glass, bolts, and other necessary ironwork are included. All the buildings are carefully put together before dispatch, and each section is marked for easy re-erection.

Specimens of Enlargements on Paper and Opal.

By R. W. Howes, East Dereham.

Mr. Howes, whose admirable enlargements we had an opportunity of noticing at the Yarmouth Convention, has submitted to us for inspection a number of specimens of his work, which stamp him as qualified to produce very satisfactory and artistic results. The specimens include *The Success*, a toned platino-bromide enlargement the face tinted, the rest of the picture in monochrome; platino-bromide enlargements in a very agreeable sepia tone; enlargements on Nikko paper; coloured enlargements on opal, and enlargements in sepia carbon. The variety of work is well executed throughout, the colouring being tastefully applied, while the results are in general so effective that they should command considerable patronage from professional photographers.

Christmas and New-year's Fancy Mounts.

Jonathan Fallowfield, 146, Charing Cross road, W.C.

Mr. Fallowfield this season repeats his customary success in obtaining a choice selection of mounts suitable for paste-on or slip-in photographs for Christmas and the New Year. In design, colouring, size, and shape the assortment of specimens that has been sent us is in faultless taste, and we can cordially recommend them to the attention of photographers. We select at random the descriptions of a few of the mounts, which will convey some idea of their novelty and beauty. *Bromida.*—Double copper-plate crenate-edged cards, with Christmas verse on front, with rococo ornament; specially valuable for platinotype or bromide pictures, which are pasted inside. *Margaret.*—All finest ivory Bristol boards. Embroidered edges,



with handsomely embossed design and motto, embossed in colours in two tints, and space inside for name to be written, and pocket to hold mounted or unmounted photo. *Gemma.*—Envelope-shape card, with flap to lift and pocket to hold photo. Handsomely embossed cards with plain stamped motto in delicate design, and space inside arranged to insert name of sender. *Rosette.*—Card similar to Gemma, but design embossed in delicate light blue, that harmonises delightfully with the tint of board used. *Serica.*—Moiré-silk imitation pocket card, with garland of flowers stamped in silver, arranged to hold photos as all above. *Favorita.*—Finest copper-plate paper. Double copper-plate crenate edge cards, with opening in front, surrounded by coloured ornamental rococo ornament, and pocket to slip in bromide or platinotype picture, and suitable verse inside.

News and Notes.

Our contemporary, *La Vie Française*, published at Lyons, is organizing a photographic competition open to amateurs only. The Exhibition will remain open from October 15 to November 15 next.

Photographic Club.—Wednesday evening, September 29, at eight o'clock. Travellers' Night. *One Boat, Two Men, and Three Cameras Afloat.* Messrs. W. R. Stretton and W. D. Welford.

The Austin-Edwards Monthly Film Negative Competition.—The prize camera for the current month has been awarded to Mr. W. McLean, 20, Ponsonby-avenue, Belfast, for his negative, *Diving.*

HACKNEY PHOTOGRAPHIC SOCIETY.—The Annual Exhibition of this Society is to be held at the Morley Hall, Hackney, on November 16, 17, 18, and 19 next. Entry forms will be ready in about a fortnight's time.

WE regret to learn from an American contemporary that Mr. James W. McDonough, whose name has been well known in the United States in connexion with the application of colour printing to commercial uses by the aid of photography, recently died, at the age of fifty-two years.

A DEED of assignment for the benefit of creditors has been executed by Christie Hipp, photographer, Lynton, Devon, under which Mr. Henry Barrett, Chartered Accountant, of Barnstaple, is trustee. The unsecured liabilities are returned at 858*l.*, and the assets at 350*l.*, after deducting the claims of preferential creditors payable in full.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.—The Annual Meeting will be held at Anderton's Hotel, Fleet-street, London, on the opening day of the Royal Photographic Society's Exhibition and *Soirée*, Saturday, September 25, 1897. The meeting will be at five p.m. prompt, and the dinner at six p.m., tickets 3*s.* 6*d.* each. Members are specially requested to reply to Secretary, addressed Anderton's Hotel, Fleet-street, London.

MESSRS. LONSDALE BROS., manufacturers of photographic apparatus, 22, Goswell-road, London, E.C., inform us that the business of the Sun Camera Company (Limited) has been purchased by them, and is now incorporated with the business of Lonsdale Bros., to whom all communications should be addressed. Mr. A. Lonsdale left on the 9th inst. on a tour round the world *viâ* San Francisco, British Columbia, China, and Japan, on his way to Australia and New Zealand, where he will make a lengthened stay, returning in about twelve months by way of Ceylon and the northern provinces of India.

ANNUAL OUTING OF THE PHOTOGRAPHIC CLUB.—At the end of each summer season the Photographic Club has what is termed an outing to Hampstead Heath, followed by a high tea at the Bull and Bush Hotel, and to which the members of the London and Provincial Association are invited. The 1897 event took place last Saturday, and, in spite of the bad weather, the following thirty gentlemen enjoyed the good things provided:—Photo Club, Medland, Wellington, Ward, Allom, Cowan, Snowden Ward, Muller, Mackie, Bedding, Stretton, Parfitt, Beard, Welford, Carter, Child Bayley, Bridge, Crofton, Dr. Charters White, Nesbit, Gotz, A. Broad and friend, J. E. Hodd and Foxlee, L. and P. Everitt, Freshwater, R. A. Hodd, Banks, Lockhart, and Harvey. Dr. Charters White took the chair, and Mr. Cowan the opposite end, the toast of "Our Noble Selves" being proposed by the Chairman, and replied to by Messrs. Bridge and Freshwater. "The Press" followed, to which Bedding said that clubs and gatherings owed much to the press, and Welford said he was not now a photographic editor, but had got a berth as honorary recorder to the Club. Many other words and friendly speeches followed, and a most enjoyable evening concluded about 8.30 p.m.

TRACED BY A PHOTO.—Mr. Fred Spalding, photographer of Chelmsford, on Saturday morning, received a letter from Miss Breen of Stanley-road, Southend, enclosing a woman's photo belonging to a young fellow, which as the back showed, had been taken by Mr. Spalding. The letter stated that the young man was dangerously ill, so ill indeed that he could not speak, and, as no one in the house knew his name, or any of his relations, the only means of finding out his identity was to ask Mr. Spalding if he could give the name and address of the person photographed. Mr. Spalding could not remember these particulars, so at very considerable trouble he searched through his stock of negatives, with the happy result that he found the one he wanted. This enabled him to ascertain that the photograph was that of a working woman, named Mrs. Trickett. Mr. Spalding visited her, and found her to be the mother of the young fellow. He broke the news to her as gently as he could of her son's illness, and read the letter to her, whereupon she started off for Southend. She arrived there to have the satisfaction of seeing her son, just before he breathed his last—in fact, she had not been in the house three minutes before his death took place. It appeared that deceased had been in Southend for some time, and had contracted enteric fever, which resulted in his death.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
27	Bradford Photo. Society	Members' Slides.
27	North Middlesex	*A Consideration of Modern Landscape Art.* H. A. Mummery.
28	Birmingham Photo. Society	Presentation of the Medals and Certificates gained at the Annual Exhibition in the Spring last, by the President.
28	Hackney	*Practical Photographic Dodges.* C. M. Hepworth.
29	Croydon Camera Club	Instruction to Beginners in Making Lantern Slides.
29	Leeds Camera Club	*Platinotype: Beginners' Errors and How to Avoid them.* Rev. J. Beanland.
29	Photographic Club	*One Boat, Two Men, and Three Cameras Afloat.* W. R. Stretton and W. D. Welford.
30	Bradford Camera Club	*South Coast.* W. Harmsworth.
30	Goldsmiths' Institute	Annual General Meeting.
30	London and Provincial	*Notes on some Little-known Developers.* A. Banks.
October.		
1	Croydon Microscopical	Conversational Meeting.
1	Wakefield	*Lantern-slide Making.* J. A. Hodges, F.R.P.S.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 16,—Mr. R. P. Drage in the chair.

Mr. T. E. Freshwater passed round for examination some photographs taken by means of the stigmatic lens, representing the Throne and some groups of statuary in the House of Lords, and which drew forth some favourable remarks respecting the quality of the lens. Later, lantern slides were projected of the same subjects, with the addition of some scenes round and about Walmer Castle, including a picture of the room in which the Duke of Wellington died.

Mr. P. Everitt showed a specimen print done on Liesegang's korn paper, a gelatino-chloride paper, toned with gold, and notable for a kind of ribbed surface, which gives a very pleasing effect.

Mr. Bullen passed through some slides of the Cowes Regatta, the work, we believe, of West, of Southsea.

Mr. A. L. HENDERSON gave his lantern display, entitled

THE QUEEN AND THE RIVIERA,

intermixing with several anecdotes his pictures of Her Majesty's life at Cimiez, the apartments at the hotel, and the splendour of the tropical plants and flowers in the grounds of the Liserb Villa. He concluded with some old slides of himself in various fancy costumes, engaged in turning the street organ, as a tinker, and sundry amusing *rôles*, and a number at Ascot and the Derby. A hearty vote of thanks was passed to Mr. Henderson.

PHOTOGRAPHIC CLUB.

SEPTEMBER 15,—Mr. S. Herbert Fry in the chair.

Dr. CHARTERS-WHITE discoursed on his recent trip to Jersey, and promised some slides later in the season.

The discussion turned upon various subjects promoted by objects of interest shown by members.

Hackney Photographic Society.—On the 14th inst. (the President in the chair), the principal business of the evening was the reading of the paper by Mr. J. A. HODGES on

NEGATIVE-MAKING,

The paper dealt exhaustively with the subject, its value being much enhanced by a number of lantern slides which accompanied it.

Bradford Photographic Society.—September 13.—Mr. SWINDON, of the Leeds Camera Club, delivered a lecture on the subject of

SQUEEGEEING AND MOUNTING.

Mr. Swaine occupied the chair in the absence of Mr. Keighley. Mr. SWINDON showed some very excellent examples of his work in the squeegeeing line, but pointed out that glossy prints were not a thing to be desired, and that squeegeeing upon a matt surface gave the most satisfactory results in every way. He also showed the advantages of the use of collodion if the smooth surface was desired, as then, should a speck of dirt get upon the surface of a print, it could be easily removed with a wet rag without destroying the polish. The lecturer also gave it as his opinion that, if the ordinary method of squeegeeing was intended, it was absolutely necessary to treat the prints to an alum bath, a statement which caused some little surprise. With regard to mounting, he showed a neat little invention of his own which was very useful when the mountant used was of a gluey nature.

Wakefield Photographic Society.—September 17.—Mr. S. D. McKellen, of Manchester, described his

INFALLIBLE SYSTEM OF AUTOMATIC HAND-CAMERA CHANGING.

This was illustrated by means of a camera with a glass slide, by which the working of the mechanism was seen, the sheath containing the exposed plate being moved smoothly, dropped into position gently, and held rigid by a gripper, which effectually prevents any motion of the sheath, no matter how the camera may afterwards be turned about. Another feature is, the mere fact of opening the front to alter stop or speed of shutter automatically closes a shutter behind lens, and that can only be removed by fastening the front up again. On the camera as sent out the usual pair of sunk finders are fixed, but Mr. McKellen advised the use of a Heywood finder, consisting of an eyepiece and a wire frame on top of camera, the shot being then taken at chin level. This finder, he claimed, gave better results than the sunk finders, and the taking the pictures at the higher level gives better perspective. A portable finder of this description was also shown.

FORTHCOMING EXHIBITIONS.

1897.	
Sept. 24-Oct. 13	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 27-Nov. 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
October 4	Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
November 1-6	Brixton and Clapham Camera Club. C. F. Archer, 1, Gauden-road, Clapham, S.W.
,, 22-27	Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.
December 9-11	Aintree Photographic Society.

1898.
January–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 27–May 14..... International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Patent News.

The following applications for Patents were made between September 8 and September 15, 1897:—

Focussing Screens.—No. 20,778. "Improvements in the Focussing Screens of Photographic Cameras." H. Weld-Blundell.

Animated Photography.—No. 20,936. "Mechanism for Hand Cameras for Producing Pictures in Series." Complete specification. E. Kronke.

Shutters.—No. 20,949. "Improvements in Photographic Shutters." Communicated by F. A. Brownell. The Eastman Photographic Materials Company, Ld.

Cameras.—No. 20,950. "Improvements in Photographic Cameras." Communicated by F. A. Brownell. The Eastman Photographic Materials Campany, Ld.

Roll holders.—No. 20,951. "Improvements in Photographic Roll-holders." Communicated by G. Eastman. The Eastman Photographic Materials Company, Ld.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COLLODION PLATE-BACKING.

To the Editors.

Gentlemen,—Mr. Wilson's witty letter would have been unwritten if he had really read what I wrote.

The Paget Company issued certain backed plates. I tried them, and I wrote an entirely friendly letter to the Company, explaining the difficulty of removing the backing and objecting to one plan they recommended for its removal.

They altered their mode of backing, and wrote that they were sorry they ever recommended the method of removal I objected to.

The objections I raised were only against the plates as first backed; I have not written a single word against their improved mode of backing. The eminent authorities quoted by Mr. Wilson have not written a line about the difficulty of removing the collodion backing; why, then, quote them? I never impugned its merits *qua* backing as against other substances.

Mr. Wilson speaks as though I had only one negative to clean. Last Monday I exposed three 12 × 10 plates in the studio, then drove into the country, and was back at seven p.m., with seventeen exposed plates. These gentlemen from the south would seem quite to enjoy such a prospect as (after developing twenty plates) removing the backing from them before the day's work was over. Mr. Henderson has told us what he has done in the shape of work; I can merely say for myself that, though for a long time past my average day's work has been about fifteen hours, I yet don't care to misuse any portion of it, and monkey-branding plate backs is nothing but a ridiculous waste of time if other plans are as good and quicker; and we have Mr. Wilson's word that by their new method the backing is "less adherent," and that in future they think I should not "have any further difficulty."

Mr. Wilson suggests that I washed platinotypes in the same sink as the plates. My best reply is to state that I have thirteen sinks, supplied by eleven water taps at my studio. G. Watmough Webster.

[This Correspondence here terminates.—Ed.]

AMATEURS AND THE PRICES OF PLATES.

To the Editors.

Gentlemen,—Some time back you published letters from professional photographers remonstrating against the action of the combination of plate-makers; they have, at all events, partly gained their end and would seem to be pacified. No one, however, seems to have thought it worth while to state the case of the amateurs, who have been more hardly hit than any other body by the plate-makers. The professionals say many bitter things about amateurs, which they can well afford to neglect; but it is different when they are being charged needlessly high prices for the plates they use in prosecuting their chosen hobby.

Without claiming for the much-abused body, of whom I am one, a total indifference to the price of the plates which they must use (unless indeed they are prepared to abandon the practice of photography, for few can give the time required to prepare their own plates), I think I may say, that none would grudge the makers an increase of price if the rise were necessary and went into their own pockets. Raising the price of plates for their own benefit does not, however, seem to have been the object of the members of the plate combination; they are willing to give the dealers all, or very nearly all, the discount they used to have on the old prices, provided they will undertake not to share with their customers, and, unless these terms as to the manner in which business is carried on are submitted to, supplies are refused.

It seems to me only reasonable that a photographic dealer should be allowed to conduct his business as he chooses. If the manufacturer fears that he is dealing on such terms as he cannot honestly afford, as, for instance, if he be selling below net cost price, then security or even cash with order may reasonably be insisted on; but, provided the maker is safe, what does it matter to *him* how the retail business is carried on?

The large dealers, whether what are called Co-operative Stores or private enterprises, can, by their command of capital and their large business, afford to be content with a smaller profit on each transaction than the small dealers; they have been in the habit of sharing the trade discounts with their customers, and have, no doubt, attracted some clients in this way. People would not, however, continue to deal with them unless they found that they were as well treated as elsewhere. In the matter of photography one finds with them a large stock to choose from, and that the articles are always fresh and good except in the case of a few things which are rarely in demand or obsolete: one can generally get intelligent advice on any doubtful matter from the staff, and is pretty sure that they have little interest in selling one article rather than another of the stock: it is then very doubtful whether the attempt of the combination to equalise prices will permanently detach any sensible proportion of the customers from the large to the small establishments, and it is quite certain that it will encourage competition which would otherwise have little success.

I can recollect when the publishers tried to boycott the discount booksellers, and I believe that photographers may profit in the end, as book-buyers have profited, by the universal prevalence of the plan which leaves all free to do business each in his way. The small dealer, often a chemist, will still have his sphere (chemicals which photographers need will often be locally purchased; and even as regards plates, many would gladly pay higher local prices for the convenience of getting what is wanted easily and without delay), but he must be content to draw his business by meeting his customers' wants, and give up the hope of having it driven to him by a friendly combination of manufacturers or wholesale dealers. J. F. T.

September 15, 1897.

THE RETURN OF SPECIMENS.

To the Editors.

Gentlemen,—I notice that the firm that has caused the majority of correspondence, *re* "The Return of Specimens without Prepayment," is *again* advertising, with the offer of comfortable situations to both operator and assistant. From information gained on the spot, I find it is usual to bring the principal assistants a distance of over a hundred miles, and after serving the first week it usually means reduction of salary, or notice. The average stay of the staff is a change of at least one every three weeks. The only comfort about the place is when the proprietor is canvassing; on his return the place is a second Bedlam—the staff generally being driven from pillar to post.

To the unlucky person who may have obtained this so-called comfort, I trust he may see these few lines, and be on his mettle. And as the lucky individuals who may not have been successful in wasting their cash on travelling expenses may probably only have to pay for the return of their specimens, it is only fair that they should, individually, give the name of this firm to the photographic world.—I am, yours, &c.,

Sept mber 18, 1897. Critic.

AWARDS AT THE GLASGOW INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

To the Editors.

Gentlemen,—My attention has been called to a letter in your issue of September 17, in which the writer complains, among other things, that some members of Committee who received premier awards accompanied the Judges while they were adjudicating on the pictures, and that the names of the exhibitors appeared on the frames while the awards were being made.

I think it right to explain that the judging at this Exhibition was conducted in the manner generally followed at exhibitions of this kind; *one* member of Committee was always in attendance to give the Judges any necessary assistance, but no member who so assisted received an award.

I may also explain that the principal prize-taker did not affix his name to his pictures until the list of awards was in the hands of the Committee.—I am, yours, &c., Geo. Chalmers, *President.*

Glasgow, Sep'ember 20, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

J. P. Tildesley, 3, Crimble-street, Leeds.—*Two photographs of Mr. Tom Mann.*

Herbert Worgan, 122, Uttoxeter New-road, Derby.—*Photograph of Derby Town Hall, illuminated for the Jubilee festivities, June,* 1897.

G. N. Ambrose, High-street, Burnham-on-Crouch.—*Photograph of H.M. watch vessel "Kangaroo." Taken from low-water mark.*

J. W. MASON.—Better call upon us some morning between ten and one.

R. W. HOWES.—To the Crystal Palace certainly. See the prospectus published in another part of the JOURNAL.

DETERIORATED PAPER.—JOB LOT. If the albumen on the paper has become of a decided yellow tint, we should say it is very little use sensitising it with the idea of obtaining good prints upon it. Why not try a sheet or two?

WASHING PRINTS.—R. E. S. Zinc trays are certainly not to be recommended for fixing prints in, neither are they for washing them directly they are removed from the fixing bath, unless they are not allowed to touch the metal.

PRINTING ON BROMIDE PAPER.—S. A. W. For contact printing, we think you will find that you will get on better by making the exposure to artificial light than by using daylight. The latter is so variable, while gaslight, if a regulating burner be used, is, practically, constant.

PHOTOGRAPHY IN PARIS.—M. Dubois-Kohne, of Clifton-grove, Old Forward-road, Torquay, writes: "If your correspondent, 'H. H.,' will not mind to communicate with me, I shall be pleased to give him any advice he may desire about his projected trip to Paris as retoucher."

COPYING BRIGHT OBJECTS.—PLATE. As you are not allowed to do anything to mitigate the high polish, the only thing to be done is to arrange the light and the object so that the reflections from the polished surfaces are not in the direction of the lens. Use backed plates; they will help you very much.

BROMIDE PAPER.—J. WILLIAMS. The flat, grey appearance of the enlargements is due to the paper having, at some time or other, been exposed to light and so become fogged. Of course, it is impossible to say where this occurred, but it may be taken for granted that it was all right when it left the makers.

JUST'S ENAMEL DEVELOPMENT PAPER.—A. S. BAXTER asks where he can procure Viennese enamel development paper in this country. It is prepared by Dr. E. A. Just, Vienna, and is advertised in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC of 1897, page 1353.—Some reader may be able to give the desired information.

BUBBLES IN LENSES.—S. J. says he has one of the new forms of lenses, made with the Jena glass, and one of the combinations has several small air bubbles in the glass which he thinks must impair the quality of the instrument?—Some kinds of the new Jena glass cannot be got without these air bells; but, although they are unsightly, they will do no harm whatever.

COPYRIGHT.—LANTERNIST. The reproductions of the paintings, though "made in Germany," are copyright here, and you will certainly get yourself into trouble if you pirate any of the works, even as lantern slides. One London house was, two or three years ago, mulct in substantial damages for pirating some German copies of paintings as lantern slides.

OPTICAL.—J. REED. It is so. If two meniscus lenses (say a pair of periscopic spectacle lenses) of equal focal length be mounted in a tube with the concave surfaces facing each other, with the stop midway between them, the combination will give perfectly straight lines at the margins of the picture. Such a lens, so far as rectilinearity is concerned, is as good as the most costly instrument.

ENLARGING.—DORSET. If you enlarge by artificial light, it will be better to use a condenser than try to equally illuminate the negative without one. It may be done, but only at the expense of great loss of light, which, of course, means a much-prolonged exposure. The size of the condenser must depend upon that of the negative to be enlarged. Its diameter must not be less than the diagonal of the negative.

CRACKED ALBUMEN PRINTS.—TROUBLED writes: "I enclose two or three cabinet prints, and you will notice some fine creases or map-like markings on them. Can you tell us the cause, and how to avoid them as we frequently have an entire batch spoilt by them?"—The trouble is due to the albumen on the paper cracking after it is dry. If the prints are allowed to curl up as they dry, the cracks will occur when they are flattened out again. If the prints are dried flat—between blotting-paper—or they are mounted while still wet, the trouble will be avoided. It is only with highly albumenised paper that cracks are met with.

TONES.—B. WALTON. The prints are very much over-toned, hence their grey, mealy appearance. They are made from very thin and weak negatives which are not such as will yield prints that can be toned to purple, or black colour; if these tones are desired, more vigorous negatives must be used. These negatives will perhaps give good prints if they are not toned beyond the red-brown stage.

STUDIO.—P. R. O. If the Council's Surveyor condemns the plans, we should advise you to modify them to suit his ideas. You may possibly be right as to the law, but you may take it for granted that you will have great difficulty in getting the Council to pass the plans while their Surveyor condemns them. Any how, contesting the matter will cause delay, and perhaps entail heavy costs.

AMATEUR.—1. Examine the print by transmitted light for the disappearance of the red colour that it has when it leaves the washing solution. When that colour has gone, you may consider the print toned. 2. "How do you make them turn white?"—If we understood your question aright, prints are bleached by a solution of bichloride of mercury, such as is used for intensifying purposes. 3. We do not know the firm named.

MOUNTS.—W. C. The interior of the mount is composed of wood-pulp boards which are made for the middles of thick mounts. The mount enclosed is of a very common quality, but it does not follow, from the mount being inferior, that it will have a deleterious action on a print mounted upon it. Experiments have proved that, *in some instances*, a common mount has been less injurious than a more costly one. That is not the rule, however.

PHOTO-LITHOGRAPHY.—LITHO EXPT. As the ink washes entirely off the paper, alike where the light has acted and where it has not, it is evident that the exposure has been too short, or else there is too little bichromate in the film. Try more bichromate and a considerably longer exposure. Possibly you are experimenting with unsuitable negatives. For photo-lithography the negatives should represent the lines by bare glass, and the white paper by great density. Without negatives of that character you will not be successful.

COPYRIGHT.—JENKINS. "I am the owner, and have in my possession an oil painting which I allowed a friend to photograph without anything being said about copyright. He has copyrighted the photograph, and is selling prints, and taking a fee for permission to use the subject of this photograph as a design and trade mark. Can I, as owner of the picture, allow any one else to reproduce the painting either as a photograph or chromo-lithograph?"—In reply: Presuming that there is no copyright in the original picture, yes.

GOTTHEIL'S DEVELOPER.—Messrs. J. Birch & Co. write: "We would be greatly obliged if you will kindly inform us where we may obtain particulars of developing bromide paper with Gottheil's one-solution developer."—The formula for the developer in question is as follows:—

Sulphite of soda (crystal)	.....	8 ounces.
Carbonate of soda ,,	.....	3 ,,
Distilled water ,,	.....	80 ,,
Eikonogen	.....	1 ounce.

A. M. Z.—1. We should think so, provided the error in exposure is not great either way. This kind of development, however, usually presupposes correct exposure. 2. We ourselves would give a fourth of the exposure. 3. The rule is: Multiply the diameter of the aperture of the lens by the equivalent focus, divide the product by the greatest allowable error (say, the one-hundredth part of an inch), and to the quotient add the equivalent focus. The sum will be the distance of the object upon which the lens should be focussed, so that all objects beyond one half the distance shall be in focus.

ENGAGEMENT.—OPERATOR writes: "I shall feel greatly obliged if you will kindly answer the following. I was engaged six weeks ago by a photographer in this city as operator and retoucher, and was to come a month on trial. Previous to my coming he has been without an operator for eighteen months or more, and, not doing any work himself, he has been allowing the apprentice and young lady receptionist to practise on sitters; consequently the business has gone down, and we are practically doing nothing. After doing my month's trial and giving satisfaction, he now tells me that, unless things alter in a week or two, I shall have to go, although he told me when he engaged me that it would be a permanency. I refused another offer which was equally as good to accept this. I am paid weekly, but nothing was said about a week's notice on either side. I should feel obliged if you could tell me whether I am entitled to a week or a month's notice."—Unless there was an agreement to the contrary, a week's notice on either side is all that is necessary.

LENS.—BEGINNER writes: "Can you favour me with your opinion and advice on the following? I am about to erect a studio, 20×12, or thereabouts. What lens of a moderate price would be most useful for all-round portraiture, including groups, in that size studio? I have hitherto used a rapid rectilinear, which is, of course, useful for many purposes, but I suppose a portrait lens would be preferable, and am desirous to know what is the best. If a rapid rectilinear is nearly as good for the purpose in your opinion, would it come in for outdoor and general work. I have a wide-angled symmetrical lens with the camera I intend using, which is 10×8."—In the first place, we should recommend that the studio be made five or six feet longer, then a portrait lens of about twelve or thirteen inches focus would be the most suitable for portraits of cabinet and up to the whole-plate size. For the larger sizes the rapid rectilinear would come in very well. If the length of studio be restricted to twenty feet, then a lens of correspondingly shorter focus must be used.

*** Several answers to correspondents and other communications unavoidably held over.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

THE thirty-seventh issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. It is already in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the ALMANAC. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us lists of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the ALMANAC is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

THE Forty-second Annual Exhibition of the Royal Photographic Society, which is now open at the Gallery of the Royal Society of Painters in Water Colours, is, of course, the best Exhibition yet held by the Society, and has the additional merit of being a typical display of modern photographic work of singularly even, as well as high, quality. Careful scrutiny fails to reveal an appreciable amount of indifferent work; on the other hand, so uniformly good are the photographs that, even with the opinions of the Judges to guide him, we do not think that any unprejudiced student of the Exhibition could put a finger on half-a-dozen works which stand, so to speak, head and shoulders above the others. In other words, good though the medalled photographs undoubtedly are, there are literally dozens among the others which it would be hard to say are inferior to them.

* * *

THE Judges, therefore, must have had a difficult task, and they have, we think, acquitted themselves of it successfully and in a manner that can scarcely create reasonable dissatisfaction. Among the medallists we specially congratulate Mr. Gear, Mr. Harold Baker, Mr. Mummery, Mr. W. Gill, Mr. Fred Marsh, and Dr. Lindsay Johnson, who for years have been patiently working their way up to the crowning photographic glory of a Pall Mall award, the most coveted distinction in Exhibition photography. The other awards are dealt with in our report.

* * *

THE now almost universal practice of framing up, the tasteful hanging, and the agreeable tones of the pictures give the Gallery an attractive aspect it has not hitherto had. We had an opportunity while in the Gallery last week of examining

some photographs of the Exhibition as it appeared about fourteen years ago, when commercial work, large and small, vast white margins, silver printing, and plain oak frames were still in favour among exhibitors. The advance in photographic taste, as illustrated by the comparison, has been wonderfully great. It would be interesting and instructive if reproductions of those photographs, as well as views of the present Exhibition, could be published, so that all might realise the strides that have been made. The Exhibition, in short, is one of which the Society may be freely proud. The photographic world may be assured that the Royal Photographic Society has this year thoroughly carried out the duty it has always performed with success, viz., brought together a collection of the best photographic work of the year. Upon the Exhibition, as a whole, no higher praise could be bestowed, except perhaps the information, voluntarily given to us by our friend who so ably presides over the "Supplementary" Exhibition, that at Pall Mall there are only two or three works eligible for admission to the gallery of the younger Exhibition.

* * *

THAT excellent and well-managed Photographic Society, the Brixton and Clapham Camera Club, deserves every commendation and support in its endeavour to organize, at its forthcoming Exhibition in November, what is termed an Invitation Section, viz., contributions by the leading photographers of the country. It is, we believe, the aim of the Society to limit the number of contributors to twelve. We wish the Brixton and Clapham Camera Club success in its laudable ambition to place before visitors to its Exhibition a selection of the best and most representative modern work, and we trust, while noting with interest who are considered by the Club the twelve leading photographers, that nobody who is not placed in the favoured dozen will be chagrined at his exclusion.

* * *

WE are so accustomed to the receipt of letters from our professional readers, complaining of the badness of trade, the cutting of prices, the unscrupulous behaviour of amateurs, the competitive effects of popularly advertised cheap enlargements, and similar lugubrious topics, that it was with a feeling of unusual pleasure we perused a portion of a communication we last week had from a photographer in a large Yorkshire town. Our friend wrote: "The press of the season is on, and I am driven with work right through the day and evening; you will be glad to learn," he adds, and indeed we are, "that there are signs of much improvement in photographic business this year. Mr. —— (of London) wrote me the other day that it had been their best season for twelve or fifteen years. In my own limited sphere I can quite endorse this experience." We trust that the experiences of our correspondent, who conducts a business that produces most admirable work, are shared by many other photographers.

* * *

IT has been our duty, on several occasions within the last two years, to point out that many photographic devices and processes that have been brought out as new were not so, and that the self-styled "inventors" of them had been anticipated years before. This duty is perhaps not the most pleasant one we should choose, but we think its performance distinctly reacts to the gain of the photographic community, which surely needs greater protection in these matters than the Patent Office affords. As a rule, our strictures have bee taken in good part; but in many cases where they have bee ignored, and the attempt has been made to obtain financia profit out of inventions that are not new, failure has usuall been the result. Next to the knowledge which photographi patentees generally seem most unwilling to acquire, that thei inventions are of no practical value, a speedy recognition o the fact that the particular ground had previously bee covered is one of the several ways of preventing the needles outlay of time and money.

* * *

SEVERAL communications relating to Messrs. Charles Lett & Sons' scheme for inducing photographers to take photo graphs for nothing have reached us during the last few days It is satisfactory to note that these letters are practicall repetitions of what Mr. Baker wrote us a fortnight ago. W have been asked to give the conditions that are to be signe by the photographer who agrees to have his name inserted i Messrs. Letts's *Almanac* as willing to take photographs. The are as follows:—

1.—The name and address of the owner of this copy of th *British Almanac* must be written in ink on the coupon in th space provided.

2.—The owner must, between January 1 and June 30, 189 present the volume to the nearest photographer, who will tea out the coupon, and, having taken the necessary negative, wi supply a well-finished copy free of all cost if *carte-de-visite* size or on payment of 2*s.* if cabinet size.

3.—The photograph so supplied is copyright, and may no be used for purposes of reproduction without the consent o the photographer.

4.—No person is entitled to more than ONE GRATUITOU COPY, no matter how many copies of the *Almanac* he ma purchase. Any attempt to obtain other copies gratuitously b applying to different photographers is illegal.

5.—The coupon having been once used is not agai available, and, being only intended for subscribers, is no transferable. Additional copies will be supplied at price quoted by the photographer.

6.—The coupons are not available for children under twel years of age.

Condition 3, which has it that a photograph which has bee paid for is the copyright of the photographer, shows tha Messrs. Letts are not up in the law of the subject.

REPAIRING AND COPYING GLASS POSITIVES.

IT is comparatively seldom now that any one is called upon t copy an old Daguerreotype, though not long ago we, in dealin with another subject, gave some practical hints as to the pro cedure in order to obtain the best results. Glass pictures however, being of later date than Daguerreotypes, and als having been produced in larger numbers than by the olde process, the more frequently come into the hands of photo graphers for reproduction, as enlargements or otherwise.

The copying of a glass positive should be, the older hands i photography would think, a very simple affair, yet two instance have recently come under our notice of the pictures being com pletely ruined in the operation. True, in each case, it was a the hands of amateurs, though we have an idea that th pictures might not have fared much better at the hands o

ome professionals if their experience is limited to the use of ;elatine plates only.

Imprimis, one may always be assured that a glass positive ›r, indeed, any other picture, although costing only perhaps a ew pence in the first instance, is valuable or, at least, is highly ›rized by its owner, otherwise it would not require to be ›opied. When they have been taken "just for the fun of the hing" by the itinerants one meets at the seaside and other ›leasure resorts, they are generally of a very inferior order, and ıave not received, in their production, the care that might ıave been bestowed upon them. It is in cases of this sort that he difficulty of repairing and copying comes in, for a really ;ood glass positive—and there are such things—is the easiest :hing possible to copy and with good results.

A glass positive is really a thin collodion negative, backed ıp with a black material, such as black velvet or black varnish. Sometimes it is protected with a colourless, trans›arent varnish, and sometimes it is not, as the varnish, if a ıpirit one, always degrades the whites of the picture somewhat; ts use is not, and was not, universal. Sometimes the varnish ıas been applied on the collodion film and at others on the back ›f the glass itself; then, of course, the picture, as regards :ight and left, is reversed. When this was done, more often :han not the picture was not varnished at all, so that better whites were obtained. In this case the picture to be copied must be carefully handled, as the collodion film will be found in a very tender condition as compared with a gelatine one, and sometimes, through imperfect washing or a decomposition in the collodion itself, it is so weak as to be injured by a dusting brush, unless delicately applied. If such a film were now to be varnished with a spirit varnish in the ordinary way, it would probably be dissolved off the plate, because the film in this state is soluble in strong spirit; therefore it should be left alone.

It not infrequently happens that the black varnish on the back of the plate has become cracked, showing map-like markings. In this case the varnish must be removed. This may generally be done with benzole, applied with a piece of rag, but not always, particularly if the picture has been much exposed to light, for then the bitumen in the varnish may have become insoluble. In such a case it must be scraped off with a knife, and, as it is in a very friable condition, care must be taken that none of the particles get on the front of the picture, as it would then be difficult to get them off again without injuring the tender collodion film. Often the cracked blacking is reblacked without removing the old varnish. If the black varnish has been applied on the collodion film, and has cracked and split the collodion film with it, the case is difficult to deal with. At times, however, if the plate be exposed to the vapour of ether for a time, and then to that of benzole for a few hours, the film will assume nearly its original state, when another coat of black varnish may be applied; but this experiment should not be tried by a novice with a picture that is highly valued; the best way will be, to simply put a piece of black velvet at the back of the plate or copy it as it is.

Up to now we have been writing on the supposition that the positives being dealt with are tolerably good ones, or were at one time, and will enable satisfactory results to be obtained from them in the ordinary way of copying. However, many have to be dealt with that are just the reverse of that, though just as highly prized by their owners, nevertheless. They may be grey and flat and have but little contrasts, and from which nothing satisfactory can be obtained in the ordinary way of working, although it may be possible by another mode of procedure.

A glass positive, as we have said before, is really a thin negative, and might be used as one, particularly if it were intensified; but, of course, that is out of the question. However, there is no reason why it may not yield a good reproduction if copied in the camera by transmitted light; indeed, it generally happens that, the worse the picture is as a positive, the better it is when viewed as a negative. In making the transparency from such a picture, a plate (if the collodion process, which is best for the purpose, is not used), giving great contrast, such as photo-mechanical plates do, should be employed, and the contrast increased as much as possible in the development. Then, in making the negative, a plate of like character, with similar treatment, should be used. Working in this way, it is generally possible to obtain a copy of a bad glass positive that is infinitely superior to the original.

If an enlargement is desired, it can often be successfully produced by making it direct from the original, using the positive as a negative, on bromide paper, without further trouble. Should the portrait be coloured, the colour will add to the density of the image and be an aid when working by transmitted light.

Aluminium Process Blocks.—A recent issue of *Aluminium and Electrolysis* gives an illustration from an aluminium plate which is believed to be the first picture produced on aluminium that has so far been published. Our contemporary states that the advantages of aluminium for this purpose are that the metal takes the ink kindly, that it prints well, that it is incorrodible, and that it is more economical than copper.

Price of Silver.—Great Advance.—Several times lately we have referred to the great depreciation in the value of silver, and mentioned several broken records. Three weeks ago it was several times quoted on the market at $23\frac{3}{4}d.$ per ounce. Since then the price has gone up almost by leaps and bounds, for last week it was quoted at $27\frac{1}{4}d.$ per ounce—an advance of $3\frac{1}{2}d.$ However, it is very unlikely that this price will be maintained for long—indeed, as we write, there is a marked downward tendency.

Is the Daguerreotype Process being Practised?—One is inclined to put this question as to the report of an inquest that appeared in one of the evening papers last week. A witness, the husband of the unfortunate woman, is made to say that "she got out of bed and drank a quantity of mercury which witness kept for developing photographs." Now, there is no process of photography in which the picture is developed with mercury but the Daguerreotype. Is that now being used? When the lay press deals with anything in connexion with photography, it generally blunders over it, as is probable in this instance.

Apropos of the Daguerreotype process, it will be noted, in the preliminary prospectus issued by the Royal Photographic Society of the Exhibition to be held at the Crystal Palace next year, that one of the features will be "a Daguerreotype studio in operation." If the studio be one such as was used in the earliest days of the process, and the latter is demonstrated, it will be a novelty to all modern photographers.

Andrée and his Balloon.—Nearly every day last week the daily papers had some report about Herr Andrée's balloon being sighted, or carrier pigeons having been captured with dispatches from him, but only for doubts—unfortunately strong ones—to be thrown upon their authenticity the next day. It seems just now that anything

unusual seen in the northern regions is at once put down as the balloon, and every stray pigeon as having been dispatched by Andrée.

By the way, of Polar expeditions there seem to be no end. Lieutenant Peary is now arranging for another to start next year. According to Reuter's agency, he will start at the end of July next for the arctic regions, and "will remain there until he reaches the North Pole or perishes in the attempt, even if it takes five years." But he is confident of success. So, indeed, we may add, have been most other explorers of these parts.

Picture Thefts.—Some short time ago, it will be remembered, there were several adroitly thefts of pictures from some Continental national collections. The galleries of Vienna and Buda-Pesth lost some of their works, and, in connexion with them, a Dr. Lenkei was arrested. On Friday last his trial was concluded, when the jury found him guilty. He was sentenced to two years' rigorous imprisonment, and then to be banished from the country. It is to be hoped that this sentence will have a salutary effect, and that the Doctor, when banished, will not try his hand on other art collections. The plan of robbery was this: The picture was cut out of its frame and rolled up, then an oleograph of the same subject, or of a similar one, was hastily substituted, so that the theft was not noticed until the culprit had got away; in one or two instances, not for a day or two afterwards. As a rule, there are not so many attendants about in the Continental galleries as there are in the national galleries here. One would think that as every picture of note, in all the English and Continental galleries, has been reproduced by photography, and the photographs published all over the world, it would be difficult for the thief to find a purchaser for them, as they would be at once recognised wherever shown.

Medals.—The question of medals at photographic exhibitions has always been a vexed one, and is still; and the awards at them rarely give satisfaction. Some of those who were at one time the greatest pot-hunters now advocate their abandonment. One of the reasons given for this is, that the picture being considered fit for exhibition, and being accepted, is a sufficient recognition of its merits. As supporting this idea, the Royal Academy and other picture exhibitions are generally quoted, and also, that artists—that is, painters—are above medals, &c. Is that so? Are they above them when they have the chance of obtaining them? At the annual exhibition of pictures at Munich medals are awarded, and English artists compete, including R.A.'s and A.R.A.'s, and usually some of them carry off awards. This year three first-class gold medals of honour go to English artists. Sir Edward Burne-Jones takes one, Mr. J. M. Swan, A.R.A., takes another, and Mr. C. H. Shannon the third. It looks well for our countrymen that they can compete in such an art centre as Munich and carry away so many honours as they do, and it also proves that painter artists are not above competing for medals—or accepting them when awarded.

Processes at the R. P. S. Exhibition.—It is always interesting to note the processes by which the large proportion of the pictures shown at the Royal Photographic Society's Annual Exhibition are produced. Last year there were 346 frames shown. This year there are 436, or nearly a hundred more. Out of the 374, in which the process they were made by is mentioned, we find that there are 189 platinotypes, 116 carbons, 30 bromides, 9 gelatino-chlorides, 3 Artigue, and 2 bichromated gum. Last year, out of the smaller number of frames there were 146 platinotypes, 92 carbons, 27 bromides, 8 gelatino-chlorides. From this it will be seen that the proportion of platinums to carbons keeps about the same, and they were practically the same in the previous year, 1895. This year the number of bromides was practically the same, and so with the gelatino-chlorides. This would tend to show that there is very little change in the ideas of those who exhibit. There are but three examples by the Artigue process, and but two by the bichromated gum process. The proportion of prints shown given as "silver" is also about the same as in the two previous years.

It must not, however, be assumed that the proportions of the processes in evidence at the Exhibition are any criterion to those that are worked commercially. For example, there are four times the number of carbons there are of bromides in the show, but every one knows that, commercially, there are far more bromides produced than there are carbons. Again, with gelatino-chlorides, although there are but nine exhibited, this process is the one most used just now for printing purposes. The platinotypes far outnumber the prints by all the other processes put together, but no one, although its use is extending daily, would assume that more platinotypes were produced in commercial photography than by all the other methods put together. It is certainly noteworthy that, at the annual exhibitions of the representative Society of this country for some years past, the proportions of the different processes keep so constant as they have done.

DIGRESSIONS.

No. XXII.—Classes.

In the apparently simple matter of judging pictures I have had varied experiences. I have judged when every picture of the eight hundred had to be tabulated and voted upon, creating, under the guise of carefulness and honesty, the wildest confusion in the results, and, as a contrast, where artistic instinct more truly found the prize. I have colleagued with ignorance and with learning, near home and far off, to deliver judgment equitably. Of recent years I have given up the invidious occupation nearly altogether, until I was persuaded to lend my assistance to a far-off show and help four others to decide who should have the medals of the International Photographic Exhibition of Glasgow.

I must not touch on what, I suppose, are private matters, or I should like to dilate on the perfections of my brother Judges; I should like to touch on the geniality of the President and officers of the Glasgow and West of Scotland Amateur Photographic Society, their thought and care for our comfort, how they dined us and danced us, and carried us off into the Highlands. Not even a Roget's Thesaurus could supply me with adjectives equal to describing the hospitality of the Glasgow people. I must not even mention these delights; but, for their own good, a frequent excuse for much injurious censure, I will find what fault I can with them, or, rather, not with themselves, but with the old-fashioned system they have clung to in instituting their wonderful show.

For it is a wonderful show in spite of all shortcomings. Taking it altogether, it is a long way the most interesting provincial Exhibition I ever saw, not, however, as I have already inferred, entirely for its perfections.

My brother Judges were two artists and two photographers; at least, that is how they were designated in the programme. This calls for a digression.

There has been a good deal said against the employment of what are called *artists* as Judges. I don't agree with this objection in judging pictorial photography. In my opinion all the Judges should be artists, but it does not follow that, because a man is an artist, he must therefore be a painter or sculptor. In fact, if he is a painter or sculptor *only*, and knows nothing of photography except what parts of a photograph may suggest to him, he is a mischievous member, and, as far as my experience goes, he is usually more inclined to give a medal for "what he himself could make of it" than for the existing print. Still, there are many painters who know something of art and a good deal of photography; these will always be valuable members of a jury, and we were exceedingly fortunate in that respect at Glasgow. Now I am on this subject, I will endeavour to make it more clear at the risk of some repetition.

The chief difficulty of a painter-artist Judge is that he has a tendency to allow himself to be carried away, not by the pictorial beauties of a photograph as a whole, but by some unimportant inci-

ental beauty, and ignore the most glaring defect. He will fall in ve with a suggestive head, or a graceful line, or a harmonious tone, id delight in his discovery, while to look at it he has to cover up id forget the rest of the picture, or fill it up from his own imagina- on, or he will show what a little gem may be cut from a large hotograph. In my opinion an exhibitor should be responsible for ie whole of his picture, the bad as well as the good. The one ifficulty has been that the photographic artist is still a scarce rticle. At Glasgow the jurors were classified in a very amusing ray, and I only refer to it in the hope that such invidious istinctions may not occur in programmes in the future.

It does not seem to be generally appreciated that the first object f giving medals should be to reward and encourage merit. The ntention seems too often to be to collect the largest number of hotographs that has ever been brought together; good quality if ossible, but numerically superior to all others it must be. The ame feeling acts against any more rejections than are absolutely ssential. The defects and shortcomings in the present instance will e found to be almost entirely due to tenderness in the exercise of he right of rejection, and the division of the Exhibition for the purposes of the awards into classes. Passing a crowd the other day, I found it was listening to what appeared to be a raving lunatic, tearing his passion to tatters on the text, "The classes are doomed." If he had applied his observations to photographic exhibitors, I really think I could have surprised myself by agreeing with a street preacher for the first time of my life. "A man," said Dr. Johnson to Mrs. Piozzi, "commonly grows wickeder as he grows older."

To the system of classes is due a good deal of innocent iniquity, and, for an instance of what approaches absurdity, eight of the medals, including two Champion golds, went to one exhibitor. This was the logical conclusion from which the Judges could not get away, while, if the Exhibition had been in any other town, it is very doubtful if the particular exhibitor, having, as we all know, a giant's strength, would not have used it like a giant, and disdained them altogether. But the public still rely on what is meant by a medal, and competition in business compels competition for medals. As it happened, the eight medals went to very worthy and original work, but, under the classes system, elsewhere they might easily have gone to very poor representatives of the art.

Another absurdity occurs in the Champion Class. Medals are offered for the best work the world can produce, new or old; yet, if a picture has not already taken a medal, it may not compete, but any taker of a bit of bronze at a village show is qualified.

In the class for landscapes, seascapes, and marine, usually the strongest, the Judges felt the absence of the best work that is now produced. To take another view of this class, withdraw the works of Mr. Craig Annan, who takes so many medals, and one or two others, including those "not for competition," and what is left? It is well known that the chief exhibitors, including the principal landscapists, will not exhibit, except occasionally under great pressure, when the awards are made in classes. In this Landscape Class some of the offered medals were withheld.

Similar difficulties were to be found in nearly every class, and still worse in another direction. There were several pictures that deserved high awards, but they could not be made to fit into the classes, and had to go without, so that while there was a medal (when the Judges did not withhold it) for very ordinary work in some classes, there was none for really great work which was shown in certainly one other, for it is not wise to add extra medals indefinitely.

Medals have been given so numerously during the last dozen years to mediocrity as to make them almost useless to talent. This is still so much the case that many who eagerly competed for them in former years now look upon them with contempt. The misuse of awards was not originally the fault of our exhibitions. For many years sufficient medals were offered to satisfy all the purposes for which they were of use—to stimulate curiosity and promote good work. The cheapening of medals has been partly the work of some of the journals, but principally through the action of the managers of some of the exhibitions, who, in their endeavour to offer baits for the million, attracted only the minnows, and drove off the Tritons. The class system was used for the purpose, and this system has been at the bottom of much of the mischief. It demoralises the exhibitor, who produces, not his best individual work, irrespective of outside circumstances, but something to suit his class; it puts the Judges in an undesirable position, and leaves them to be interviewed by disappointed exhibitors, and asked to explain "what they mean by it." Perhaps its worst effect is, however, to prevent some of the best photographers from lending pictures for competition, or at all. They know that, besides countenancing a vicious system, if they send their works marked "not for competition," they will be put in a class aside, and attract little attention, or have no notice taken of their abstention, and appearing to all the world in the catalogue in the undignified position of having competed and failed.

Then, what would you have? If we have medals at all—and I don't greatly object to them if worthily given—I would award a medal to a photograph, not because it was first, or second, or tenth, of a class, but because it was worthy of it. I have seen a medal given in a class *because it was a landscape*, and landscapes happened to be scarce, not because it was worthy of the honour. This is not much to ask for—only merit. Some of the demerits are gone. Above all, the amateur no longer cries to be protected from the professional, or the professional from the amateur. That classification is abolished; we are now all photographers together.

Now I have screamed my scream, let us return to what I began with.

Notwithstanding a blot or two, respecting which I believe most of the managers now agree with me, I am ready to join Mr. Blanchard, one of my co-Judges, in maintaining that this is one of the finest general exhibitions of photographs ever held in Great Britain, and, of course, that claim covers the whole world. The managers have such an overwhelming arrangement of advantages, including some experience of a successful former exhibition; finer galleries than are possible in London; a President who is always everywhere and calm; an Hon. Secretary who knows, strange to say, other things than photography; a Treasurer who has other uses in constant employment besides writing cheques; and a Committee and helpers who seem made for the places they so admirably fill, including, I believe, a convener of entertainments. There are others whose office seems to be to take you prisoner in the morning, and give up your remains reluctantly at night.

It was, perhaps, in the nature of an anti-climax, but I finished up the visit to Glasgow with a photographic meeting out at sea.

I was on the Clyde, steaming along outside Arran, sitting on the deck of the *Columba*, changing a spool in that new Kodak camera, and feeling like that genial Chinaman we all used to know when he saw a bit of Surrey. He was in despair that he had only means for a hundred exposures. I was thinking of our old friend when a young gentleman came up to me and said, "You seem new to that instrument, sir. Do you know it ought to be changed in the dark?" Then another came up and confirmed the young gentleman, both producing their own instrument, and demonstrating that it must be changed in the dark. I was so stupid and new to the art that I excited compassion, and photographers, or rather Kodaks with photographers attached to them, appeared, as the gulls do for biscuits, out of nowhere, until a crowd got together, every individual delighted to find a Kodak in his neighbour's pocket, and they tried to teach me something of photography all the way to Ardrishaig. You meet with kindness everywhere in Scotland.

Those films changed on deck in the open light of the sky—I admit for the first time—developed perfectly. But then I did as the young gentleman recommended, and bought the solutions.

H. P. Robinson.

THE COLOUR OF COLLODION TRANSPARENCIES.

In your leading article on *Development and Toning* in last issue, reference is made to the influence exerted by the organifier upon the colour of the resulting image on collodion dry plates, and you further point out that, in order to derive the fullest possible advantage from this source, a slow plate is necessary. This is undoubtedly the case under any circumstances, but I think we may go

further, and say that, by preparing the plate in a particular manner, still more marked colour effects can be obtained than with a merely slow plate treated with any special organifier.

I think it must have been noticed by all who have worked collodion emulsion for a number of years that there appears to be a greater difficulty nowadays in obtaining the extremely warm tones that were so familiar twenty or twenty-five years ago, even when the emulsion is intentionally made slow and a tannin or similar preservative is used. The difference may be set down to an alteration in the character of the pyroxyline now obtainable—and probably to a slight extent that may have some influence—but I am more than inclined to think that the real reason is to be traced to the different methods now adopted of making the emulsion.

In speaking of a slow emulsion, we, of course, only employ a relative term, and, other things being equal, it is quite true that warm tones are more easily obtained with a slow than with a rapid one; but it is by no means absolutely necessary that a really slow emulsion be employed in order to obtain far "warmer" colours than are ordinarily required for transparency purposes. Those who were familiar with the Liverpool dry plates in the early days of their preparation by Mr. Peter Mawdsley will remember that they were far from slow as collodion dry plates, in fact, were amongst the quickest obtainable, yet the colour of the image with an ordinary exposure—*i.e.*, a sufficient exposure—was invariably a warm brown, passing, in the case of over-exposure or in a very good light, into various shades of bright red, even claret, crimson, and sometimes almost vermilion.

Some of the quickest exposures I ever made with collodion plates were on a holiday in North Wales in the summer of 1868, a summer memorable for its intense heat, as well as the long spell of fine weather we were favoured with. I had ten days of continuous sunshine, brilliant and scorching, and was compelled to cut down my exposures to the lowest limit of safety, in the case of open views to a few seconds only. Yet the whole of my negatives were remarkable for the extraordinary range of red tints they showed, varying from delicate pink in the half-tones and shadows to deep, rich crimson, claret, and maroon in the lights, and, even where masses of heavy foliage were scarcely sufficiently exposed, the colour would be purple black.

This result, as well as in the case of Mawdsley's plates, was, no doubt, due to the method of preparing the emulsion, and not to the fact of the plate being slow. In those days it was the custom in using emulsion to *desensitise* the portion that was left after coating a batch of plates in order to prevent its getting foggy before being again required, a plan that was further recommended by Mr. Mawdsley, amongst others, for improving the quality of the emulsion, which it undoubtedly did. For this purpose, after the coating for the day was done, a definite quantity of bromised collodion was added to the emulsion that remained, and the condition of approximate equilibrium between the constituents was converted into a very decided excess of soluble bromide, in which state the emulsion would keep for any length of time. When again required, sufficient silver nitrate was added to sensitise the quantity of collodion last added, and the emulsion was used almost immediately, at any rate within a few hours. This plan, I believe, was systematically followed by Mr. Mawdsley, who always had a large quantity of emulsion partly sensitised, and the full quantity of silver was only added for each day's use.

An amateur working in this manner would always have a stock of well-ripened emulsion in hand, containing a more or less considerable excess of soluble bromide, and depending for its degree of sensitiveness upon the quantity of silver finally added and the length of time allowed to elapse between the final sensitising and the actual coating. Such an emulsion would, under any circumstances, give what was known as a "creamy" film, by reason of its ripened condition, and would be capable of use without any final sensitising, if only well washed before organifying. After the final sensitising, however, it might actually contain an excess of silver uncombined, or only partially combined, and be capable of use without fogging for a certain length of time, though, of course, its condition would be constantly changing during that period, whence the necessity for using it within a few hours of sensitising. After a certain period, if a sufficient quantity of silver were used to neutralise the whole of the free bromide, when that was converted, the emulsion would become foggy and useless.

An emulsion treated in this manner has as its chief characteristic an extremely fine formation of silver bromide, due to the lengthened ripening under excess of soluble bromide, for, unlike a gelatine emulsion, when cooked under similar conditions, it does not become coarse and granular. If on the final sensitising only sufficient silver be used to leave the bromide still slightly in excess, the emulsion would retain its good qualities and its fineness of division perhaps for several days, and would then possess a fairly high state of sensitiveness, but would gradually lose its peculiar power of giving red tones. If an actual excess of silver were used in the last sensitising a still higher degree of sensitiveness would be conferred, but the final change would come very rapidly unless checked in time by the process of desensitising.

The colour effects seem to depend in the first place upon the fine state of division, and also in some way upon the effect of the excess of bromide; for, if the latter be nearly neutralised, the colour power gradually passes off; or, if without neutralising the excess of bromide, the emulsion be washed and redissolved, the same effect takes place in a great measure, or at least the capability for red tones is very greatly lessened. W. B. Bolton.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Time rolls by, and we seem no sooner to have got rid of the excitement of one annual exhibition of the Society, its awards and rejections, than we once more get the polite card from the Honorary Secretary, inviting us to come and inspect the outcome of the year's work as gathered together on the walls of the Pall Mall Gallery. The oldest institution of the kind in photography, there is a hoary respectability about the "Forty-Second Annual Exhibition," which would lead an outsider to expect dignified repose, almost perhaps sloth or even decay, in so antique a body, using the expression photographically. Needless to tell our readers that, while the dignity of the Society is in no way impaired, but has rather of late years been enhanced by the graceful act of Her Majesty, it never, throughout its long and chequered career, manifested more signs of healthy activity, or wielded a more powerful and beneficial influence in photographic circles, than at the present moment. Its President (the Earl of Crawford) combines scientific attainments of no slight order with the social standing expected in the recognised head of British photography, and it can never be said of him, as it was, we believe, of the Duke of Argyll, that he was alone, "too much of a philosopher to associate with dukes, too much of a duke to mix with philosophers."

The Exhibition, which opened to the public on Monday last, was, as usual, inaugurated by a private view on the previous Saturday morning followed in the evening by the *Soirée*. At one or other of these functions most of those best known in the photograhic world were to be met. Both were crowded, over nine hundred visitors being present in the course of the day, some four or five hundred of whom must have been present at nine o'clock on Saturday night, when the throng was greater than we ever remember it to have been.

The Soirée.

The guests were received by the President (the Earl of Crawford), Mr. Scamell (Honorary Treasurer), Mr. Wilmer (Honorary Secretary), Mr. Clifton (Honorary Librarian), Mr. Chapman-Jones (Vice-President), and the following Members of the Council: Messrs. Bedding, Bolas, Bridge, Cadett, Haddon, Ives, Lambert, Mackie, Marchant, Mummery, A. Spiller, Swan, E. J. Wall, H. Snowden Ward, and Warnerke.

Among the many present were the following: Dr. J. J. Acworth and Mrs. Acworth, Messrs. A. E. Allen, W. M. Ashman, W. Smedley Aston, Harold Baker, Bannister, E. G. Barron, Agar Baugh, Child Bayley (Assistant Secretary), E. H. Bayston, Beadle, Beeson, R. R. Beard, Conrad Beck, Benest, H. W. Bennett, L. M. Biden, Birtles, Mrs. T. Bolas, Messrs. S. B. Bolas, Brawn, Briginshaw, Bruce, Bullen, Burchett, H. J. Burton, Caird, Calland, Cayford, Cheshire, Clapton, W. L. Colls, Crew, Dalgleish, Dando, Sebastian Davis, Dovaston, W. E. Downey, Mr. and Miss Drage, Dr. Dyall, Messrs. Eastwood, H. J. Ellis, Esler, Dr. Fallows, Messrs. Fitch, Flint, Foxlee, Freshwater, S. H. Fry, J. Fuerst, Colonel Gale, Messrs. C. W. Gamble, J. H. Gear, Gill, Golding, Goodwin, Gorin, Gosling, Gower, Grant, Gray, Greatbatch, Gregory, Gunston, F.

Haes, Hardee, Hargraves, Head, Henderson, Hindley, Horsley Hinton, Hollebone, Hudson, Humphrey, Hurman, Hyde, Illingworth, Inskipp, Inston, Isenthal, Mr. and Mrs. F. W. Jackson, Mr. G. H. James, Miss Agnes Jennings, Mr. W. N. Jennings, Miss Johnstone, Messrs. King, Keith, Lankester, Bridges Lee, Levett, Welch, Lisett, Lund, Maclean, Malby, Marriage, Mr. and Mrs. Fred Marsh, Messrs. Marshall, Martin, Matthews, Mattocks, M'Donald, Moberly, Mote, Moysey, Muller, Muncey, R. Y. Murphy, J. Nesbit, Oakden, O'Neill, Parfitt, Payne, Penrose, F. Pither, Mr. and Mrs. E. E. Pither, Messrs. Plank, Porter, Prestwich, Procter, Rawlings, Dr. J. P. Richter, Messrs. Rochefort, Salmon, Sandland, Sanford, Lyd. Sawyer, E. Scamell, H. Senier, Sanger Shepherd, Slater, Smart, H. Smith, Snowden, G. Stevens, Swingler, A. F. Taylor, Mr. and Mrs. Hay Taylor, Messrs. W. Taylor, Thomas, Thorn, Thorp, Thurston, Tylor, Walford, H. Walker, S. E. Wall, Mrs. Snowden Ward, Messrs. Welford, Welham, Mr. and Mrs. Wellington, Miss Ward, Messrs. Charters White, E. White, Whitlock, S. H. Wratten, Frederick York, and Zachariasen.

From the list we give above it will be seen that the representative character of the gathering was fully kept up, and that many photographers, whose residence and occupation prevent them from meeting many kindred spirits throughout the year, took advantage of the opportunity offered to renew acquaintances with their brethren of the camera. The weather, unfortunately, was inclined to be both close and wet, and the temperature of the gallery, in spite of all attempts at ventilation, rose to an uncomfortable pitch long before the proceedings terminated.

The Judges and Awards.

The experiment of having no less than four artists upon the jury was not found to give rise to any great amount of discontent with their decisions. We ourselves are inclined to approve of the awards as a whole, and we have not so far heard of exception being taken to any. The jury consisted of,

Art Section.

F. P. Cembrano, B. W. Leader, A.R.A., Sir James Linton, P.R.I., G. A. Storey, A.R.A., W. L. Wyllie, A.R.A.

Technical Section.

Captain Abney, Chapman Jones, and Andrew Pringle. We are informed that, with the exception of Mr. Storey, who was out of town, the entire jury officiated. The Society's bronze medal was awarded in all to eight photographs, and to one piece of apparatus as follow :—

No. 10, *The Receding Tide*, John H. Gear; No. 76, *The Landing-place*, J. C. S. Mummery; No. 145, A portrait, Elliott & Son; No. 175, *Gloucester Cathedral Crypt*, Bolas & Co.; No. 186, *A Pleasant Occupation*, W. Gill; No. 258, *Gas Works, Charging Retort*, Fred Marsh; No. 347, *North Ambulatory, Ely*, Harold Baker; No. 435, *The Normal Macula lutea in Man.* Photo-micrograph, Dr. G. Lindsay Johnson; No. 457, *The new f-6 Stigmatic lens* (J. H. Dallmeyer, Limited).

The Gallery.

A contemporary, whose information as to the Society and its proceedings is frequently diverting by reason of its extraordinary inaccuracy, due possibly to the fact that it is drawn from ill-informed individuals, has recently stated that the selecting was performed in some three and a half hours, which we are in a position to contradict absolutely, while the same writer points out that in the case of the Salon two days were consumed in the same operation. Apart from the fact that the photographs sent in to the Dudley Gallery demand a more or less prolonged examination, we can quite understand that, with so many conflicting interests to harmonise, and with so many factors quite apart from the mere merit of the photographs themselves to take into consideration, the selecting must take an unconscionable time. Whatever time the selection at Hanover-square took, and we have been officially informed that the three and a half hours statement can only be a guess, and a bad one at that, the selecting appears to have been done most judiciously. Certain it is that there is very little on the walls which it would improve the Exhibition to remove.

The Hanging Committee has done its work well. We have never seen the gallery better hung, and the general effect is an excellent one, due both to their labours, to the draperies which have been added to conceal as far as possible the shortcomings of the wall covering, and to the princely munificence of the Royal Society of Painters in Water Colours, who have graciously permitted the use of a better carpet than the well-worn covering which had seen service at some twenty of the exhibitions, we should guess, at the very least.

A preliminary glance round the walls shows us that it is useless to look for any particular exhibitor in a given spot. The position of the pictures has been governed by their merits and by a due regard to the general effect of the room. The rough classification, first adopted last year, got by placing many of the portraits in the middle of the wall by the door, has been continued, and architecture in the same way dominates the top end of the gallery. White mounts and brilliant frames are gathered together into two small groups on the opposite side to the portraits, but otherwise the pictures of note are distributed very evenly in the different parts of the gallery. Colonel Gale, whom we were glad to see at the *Soirée*, although we noted with regret that he is not yet able to do entirely without a crutch, is not represented this year by any pictures at all, a fact which is due to an illness during the last month or two. This is a break in a long succession of years during which his work has attracted as much attention as that of any worker, and he will have the sympathy of our readers and their best wishes for a speedy recovery, we feel sure. Mr. Cembrano is another absentee on this occasion, domestic bereavement having deprived us of any pictures from his skilful hands this year. On the other hand, Mr. J. C. S. Mummery has come to the front with some fine landscape work, finer than anything he has yet shown, and several other well-known workers are represented in force.

The Pictures: Portraiture.

To come now to the question of the pictures in detail, Mr. Harold Baker should be mentioned as exhibiting, in No. 40, a fine portrait of Miss Lily Hanbury. This is a very soft but rather deep-toned carbon print, mounted close up in a bronze frame with a deep moulding, and is a good example of the kind of work in this direction we expect from Mr. Baker. Nos. 43 and 54 are smaller portraits in red carbon similarly framed, but do not call for any special notice. No. 347, an interior, *North Ambulatory, Ely*, is an extremely rich, vigorous print, although without any trace of hardness. Amongst the many examples of architecture in the Gallery, this ranks deservedly high, and possesses the merit of standing out by itself above the high level of uniformity which this class of thing seems now almost to have reached in our bigger exhibitions. No. 365, *Andante Dolcemente*, is the least attractive of this exhibitor's work, the pose of the figure, while good in itself, being spoilt by the straight lines and conical outline of the skirts. There is a stiffness about it which one would hardly expect, and which is not to be met with in No. 372, one of the smaller portraits and one of the best. This latter is an example of the ingenious manner in which Mr. Baker combines a graceful and unusual pose with one which obviates the use of the much-decried head rest. Mr. John Stuart sends altogether nine exhibits. No. 1, "*Buy my flowers, pretty gentleman*," is a fair example of his average work. The pose is none too free, and the design on the upper part of the dress appears to depend almost entirely upon brush work. *A Portrait Study*, No. 33, is altogether happier, the expression and pose of the head being free and pleasant, and the work broader than the foregoing. No. 138 is a good example of architecture, but is not conspicuously better than many of the other specimens in the Gallery; but No. 146 pleases us much more. This is an interior of a drawing-room taken by flashlight. A figure has been happily introduced, and, although the definition of the many objects which the room contains might not be appreciated by the very modern school, it is distinctly of a class to give general satisfaction. No. 147 is a similar subject, but is by no means so well rendered. No. 154, *The Cellararium, Fountains Abbey*—a particularly difficult subject, as we happen to know—is very successful; the long lines of arches, which, enshrouded in the very deepest of shadow, make photography by no means an easy task, are here very well portrayed. No. 259, by way of showing this exhibitor's versatility, is a landscape with figures, a tent with some gipsies, and a brushwood fire. It is difficult to hold one's own in several directions at once, and we think Mr. Stuart is weaker in his landscapes than in the portraits, the latter being decidedly his *forte*. *Old Luss Road*, No. 282, calls for little comment, No. 352, *The Home of the Water Hen*, being the best of the landscapes. Mr. Stuart is to be congratulated on having succeeded in getting more than one specimen of each class of his work through the ordeal of the Selecting Committee.

A prominent position over the door has been assigned to a fine bromide enlargement, Mrs. Tree as *Fedora*, by T. C. Turner. It is an example of a kind of work of which we do not see much at the Exhibition nowadays, its size alone tending to give it an overwhelming predominance over its neighbours, which renders the hanging of such photographs a difficult matter. In fact the position which the Hanging Committee have given it, immediately over the door, is about the only one in the room which such a picture could very well occupy with effect, while its size, at the

same time, admits of its being seen with advantage in a position which would render most of the smaller work almost invisible. Messrs. Elliott & Son send three very striking portraits, of which one takes a medal. They are printed in brown carbon, which suits the subjects very well, and form almost the only example in the room in which more than one picture is included in a frame, a disappearance which we, ourselves, cannot regret, although it appears to discourage the professional photographer somewhat. Lafayette, of Glasgow, has one exhibit, No. 36, a study in brown carbon, nearly full length. The portrait itself is of considerable merit, although the frame, from the gaudy nature of the inner gilt line, hardly allows the eye to do justice to it.

In that portion of the room once referred to by Mr. H. P. Robinson, as the "post of honour," a title which has, with just a hint of sarcasm, clung to it amongst frequenters of the exhibition ever since, a portrait of a girl with a violin by W. M. Warneuke occupies the centre place. Good, on the whole, as this exhibitor's work usually is, the particular print in question does not strike us as being anything out of the common. The pose is satisfactory enough with the exception that the feet appear to be abnormally long, but it is printed to such a deep tone without anything approaching a white in it, and framed up close in a deeply recessed black-painted frame, that the general effect is very sombre and depressing. This is even more marked than was the case with the same exhibitor's portrait hung almost in the same position last year, which erred to some extent in a similar direction. The landscape No. 201, by the same worker, is by no means so heavy, although it lacks some of the sunniness which was so conspicuous in Warneuke's work three or four years ago. Two platinotypes of children, which have been placed by the Hanging Committee in what is otherwise a very low-toned panel, we refer to Nos. 39 and 52, by Charles Sweet, afford a very refreshing and agreeable relief. They are at once brilliant without being harsh, and the poses in both cases are very successful. No. 53, by the same worker, a portrait of the Rev. Hugh Black, is another of the portraits in the room which possibly err on the side of flatness. The attitude of the Reverend gentleman seated easily at a writing table with pen in hand is satisfactory, but there is a general flatness we do not like, the forehead and some of the hair being so much of the same tone as the background as to fail to suggest the real outline of the head without a more or less close examination. In No. 66, *Chapman Jones*, by F. Hollyer, we have a portrait very much in Mr. Hollyer's usual style of a gentleman well known at 5a Pall Mall East. Its immediate neighbour, a portrait of W. Thomas, by A. C. Hoskins of Leeds, is a very fair portrait of the Chairman of the Affiliation Committee, but possesses no very striking feature. The carbon print, No. 379, of *Napier Hemy*, also by Hollyer, is much more striking than that already mentioned, and as an example of a bold, and to some extent, an unusual method of treatment, will well repay examination. It is interesting too from the printing process employed, which we gather from the catalogue to be carbon, but apparently upon a canvas basis, varnished and not glazed. Mr. Hollyer also sends one of his well-known copies of pictures by Burne Jones.

Philipp von Schoeller seems to us not to attain the high standard reached by his delicate little portrait last year. *A Nun*, No. 54, is very similar in style, but by no means so impressive. He sends also a frame containing what is described in the catalogue as a *Study in three colours, bichromated gum*, but it is difficult to gather from the description much of an idea as to the details of the process employed. Judged by its effect only, the result is very satisfactory, but one would like to know how large a part was played by photography and how much by the manual dexterity of the worker himself. R. S. Webster sends, in addition to a remarkably dainty little landscape, No. 273, *A Summer Sea*, the water in which is very well portrayed, three portraits, Nos. 47, 51, and 56. No. 47, *Oh, rest in the Lord*, which is reproduced in the catalogue, is certainly the best of the group. No. 56, hanging very near it, and like it, a portrait of an old lady, rather suffers by its near neighbourhood. Both, however, are to be prefered to No. 51, which, good in its way, is not better than many of its companions in the Gallery. In No. 67 we have a portrait by Mr. R. W. Craigie, very similar in character to one shown a year or two back. Chas J. Berg sends a number of portraits, of which No. 44, the only nude study in the room, and No. 46, *Ionia*, appear to us meaningless. No. 29, *Coquette*, is much more satisfactory from all points of view; the pose of the head thrown back and supported on one hand and the half-laughing expression go well together, the only fault to be found being in the straight lines of the arm, which fall unpleasantly near the centre of the picture. The same exhibitor sends also No. 63, *A Daughter of the Nile*, and No. 118, *Renunciation*, a nun-like figure holding some lilies. We do not quite exactly know what it is she is supposed to have renounced, the world, the flesh, or the devil; but, whatever it is, she has done so as per the catalogue, and there the matter ends.

Landscapes.

So far we have directed our attention mainly to some of the more prominent portrait exhibits in the Gallery; landscapes, as usual, occupy a very considerable proportion of space, however. As soon as one enters the room, turning in the orthodox manner to the left, the medalled picture, No. 10, *The Receding Tide*, by John H. Gear, attracts attention. The locality suggests that happy hunting ground of the modern landscape photographer—the Essex mud flats; but the lighting, while being bold enough to impart no small amount of vigour to what, no doubt, is usually a dull and uninspiring scene, is free from that straining after theatrical effect such as too often spoils the undoubtedly fine landscapes in the same neighbourhood by Horsley Hinton. The latter is represented by five landscapes, the general nature of which can easily be guessed at by any one who is acquainted with Mr. Hinton's previous work. We do not wish by any means to decry what all must admit to be very excellent photography, but we think he would be wise were he to attempt to produce something a little less like most of what he has exhibited in the past. The best of this worker's exhibits, and one in which the "scene-painting" style of lighting is least aggressive, is No. 86. The Judges, we note, appear to be of our opinion in the matter, since they have selected this as one of those to be purchased for the permanent collection of the Society.

Mr. J. C. S. Mummery may be congratulated on having what is, in our opinion, the best collective exhibit of any landscape worker in the Exhibition. In No. 76, his medalled picture, *The Landing Place*, we have a seascape, with the hull and mast of a small vessel apparently lying high and dry on the sand, while the figure of a woman, strictly in the othodox position according to Burnett, breaks up the otherwise flat foreground. The whole effect is a delightful one; the clouds are just sufficiently evident to suggest a rather bright, grey day, and few are likely to cavil at the medal which the Judges have seen fit to bestow upon it. This picture, in common with one or two others in the Exhibition, is a carbon print upon what appears to be a canvas surface, a texture very suitable to the particular subject in question. No. 203, *The Meadow Lane*, also by Mr. Mummery, shows us a grass-grown road bending round past a thicket of trees, the lighting, as a whole, giving a pleasant suggestion of the close of a summer's day. In No. 202 Mr. Mummery has endeavoured to give us an impression of Hampstead Heath by moonlight. The impression is successfully conveyed, but how much of the success is due to pure photography we should not like to say. It is, at any rate, a far truer rendering then the under-exposed photographs taken facing the sun, and purporting so frequently to be moonlight, have ever approached. Mr. A. J. Golding, whose work is of a very similar character, and who, by the way, is also a well-known member of the North Middlesex Photographic Society, of which Mr. Mummery is President, has four photographs this year, which show a marked advance on anything he has exhibited, at any rate in the last two or three years. Here, again, we have a carbon print on canvas, particularly in the case of No. 224, *How gently fades the Waning Day*, a quiet evening pastoral of the simplest possible materials. No. 251, *A Road across the Dunes*, by the same worker, is a very successful midday effect; but in No. 84, *Where Shore and Meadow meet*, the suggestion of his medalled picture, *Where Sea meets Land in Daily Strife*, of some three years ago, is very strong. We trust Mr. Golding will struggle to avoid falling into the habit of repetition which is becoming but too conspicuous in several workers, who adopt the same class of subject. While on the subject of landscapes, we must not omit to mention No. 327, by John H. Gear, *The End of an Autumn Day*, a farmhouse surrounded by leafless trees, reminiscent of Kidson Taylor's *Hampshire Home*. Mr. J. A. Hodges disappoints us this year altogether. In No. 24, *Penmaenmawr*, we have a seascape, in which the distance is very well rendered, but with a foreground as weak in tone as the distance itself, while much hand work appears to have been done both to sea and sky. No. 116, *A Welsh Pasture*, is really the only print by this worker that appeals to us at all, No. 192, *At a Suffolk Staithe*, suggesting nothing but a rabid Salonite in his wilder moments.

Amongst other landscape workers, Percy Barron, who sends a number of very delicate pictures of a small size; J. Carpenter, whose *Sunshine and Shade*, a most charming effect of sunlight streaming through the branches in a wood and falling in scattered patches upon the grass and brushwood; and Henry Smith, with a successful rendering of Turner's trees, in No. 195, should not be omitted. Mr. J. A. Sinclair sends five exhibits this year. No. 260, *Where Brooding Darkness Spreads his Jealous Wings*, a late-evening effect, the sun setting beind a tree-fringed

ake, is, in our opinion, the best. No. 19, *Trau Gate*, hardly comes up to he standard that we expect from Mr. Sinclair, whilst No. 331, *A Dalnatian Fruit-seller*, competes with a very similar figure subject exhibited ast year and suffers by the comparison. No. 272, *Beasts of Burden*, an ox-cart in brilliant sunshine standing before a building in deep shadow, is pleasing without being ambitious; but in No. 281, also by Mr. Sinclair, the heaviness about the sky and tree detract from the merit which the picture would otherwise possess. Mr. W. Thomas, in No. 216, *Sunset on a London Common*, gives us a picture of a distinctly common type in more senses than one. It is a good example of its class, but the upright-sunset effect reflected in the water in the immediate foreground, the intervening landscape being of a nondescript character, is one of which we are getting rather tired. No. 193, by the same worker, *'Twixt Day and Night*, apparently taken in the Pool of London, belongs to another hackneyed class. No. 215, *Maldon, Essex*, is a pleasanter composition than either of the foregoing. No. 199, *In a Birch Wood*, possesses no small amount of "breadth," the frame, on the other hand, being very conspicuous for its depth. We must confess we prefer Mr. Thomas in his "earlier manner," as can be seen in Nos. 227, *The Close of a Stormy Day*, and 228, *On a Flowing Tide*.

B. Gay Wilkinson, whose name one always instinctively associates with that of Gale, shows but two prints, and these hardly up to his standard in former years. No. 232, *Crossing the Village Green*, reminds us of the Wilkinson of some four or five years back, but No. 233, *Feeding the Ducks*, is hard and crude, the sky meaningless and heavy, and the whole effect inferior to what we might have expected from so good a worker. Mr. Wilmer has found time, in spite of his cares as Honorary Secretary of the Society, to produce two photogravures, one, No. 245, *Early Morning, Kiel Bay*, being photographic throughout; the other, No, 409, *A Squall on the Medway*, from a sketch by W. L. Wyllie, A.R.A. Both are excellent examples of the capabilities of the process in the hands of an enthusiastic amateur. We are glad to see Mr. J. B. B. Wellington represented once more at Pall Mall. His picture, No. 348, *On Salhouse Broad*, is presumably a Convention one. In landscape work we must not omit to mention Mr. Charles Job, whose snow scene, No. 18, *Snow and Sunshine*, not only is a capital rendering of a difficult subject, but possesses an originality which No. 122, *The End of a Winter's Day*, by W. B. Post, can hardly claim, strongly suggesting as the latter does *Home, Sweet Home* in the same Gallery some three years ago by Rudolf Eickemeyer, jun. Leslie Selby, in Nos. 209 and 222, also deals with snow landscapes in an effective manner. In fact, the few snow scenes which are to be found in the Exhibition this year are amongst the happiest of the landscape efforts. Other exhibitors in this class whose work might well be studied with attention are George Lamley, Viscount Maitland, Alexander Keighley, and John Bushby.

Architecture.

With so many fine architectural subjects as are to be found at Pall Mall this year, the task of giving an award to this class of work must have been a particularly difficult one. The two firms, Messrs. J. Bulbeck & Co., and Messrs. S. B. Bolas & Co., are both well represented, and, though the latter have succeeded in gaining a medal, the former run them very closely. Nos. 124, 126, and 135, by Messrs. Bolas, should be noted on account of the sunlight effects which add greatly to their impressiveness. Nos. 115 and 127, by Messrs. Bulbeck, may also be instanced as of conspicuous merit. No. 164, *S. Apollinare in Classe, Ravenna*, by E. G. Boon, and No. 151, *A Doorway in Rochester Cathedral*, by E. R. Bull, are also to be noticed. In No. 134, *A Wet Day, St. Mark's Corner*, Mr. S. L. Coulthurst has utilised the reflections of the columns on the watery pavement to break up what would otherwise be a most uninteresting foreground. Space prevents us from discussing at length the merits of a good deal of the architectural work in the Exhibition.

Taken altogether, this section is perhaps the best, and has been rendered more effective by the fact that no small proportion of the photographs are kept together at the top of the room. Amongst the work of foreign exhibitors Messrs. Boissonas & Stieglitz and Miss Frances B. Johnston should be mentioned. Mr. H. Stevens's most successful picture is No. 325, a portrait of a little girl in a carved oak chair with a cat in her lap. The pose is particularly easy and graceful. No. 373, by the same worker, does not appeal to us so strongly. Dr. George M'Donald sends four photographs of flowers, Nos. 375 to 378, which will stand comparison with his medalled work of last year.

Technical Section.

Coming now to the corner of the room in which exhibits of more or less technical interest are usually found we see three reproductions by the Autotype Company which may be taken as excellent examples of their class. Mr. Sandland sends four zoological studies, the *Polar Bear*, No. 398, being undoubtedly the best. Two three-colour collotypes by Walford & Co., and one by Bolas & Co., the former, Nos. 400 and 401, and the latter, No. 402, do not strike us as favourable specimens of their class. In fact, as they stand, they are little, if at all, superior to an ordinary chromo-lithograph. The process may be of value in the future, but at its present stage can only be considered as an experimental one. In collotypes, *Views in Kashmir*, by J. W. Groves, are excellent technically, but have few merits pictorially. In addition to these exhibits we have a number of X-ray photographs by Dr. Wolfenden, and two by W. Grant, snakes, star fish, and lizards appearing to be the favourite subjects.

The Autotype Company's collotypes illustrating Lord Armstrong's *Electric Movement in Air and Water*, are of a distinctly "fireworky" character. As collotypes they are excellent. The Judges have awarded a medal to Dr. Lindsay Johnson for what may be regarded as a *tour de force* in photography. This consists of a series of sixteen photo-micrographs placed side by side forming a complete series of a section through the *Macula lutea* in man. The combination being remarkably well done, the whole print may be regarded as one micro-photograph some five feet long, showing the details of the structure in the neighbourhood of the blind spot with wonderful fidelity.

Appabatus.

Probably, in consequence of the extended facilities for a thoroughly good display of apparatus which will be afforded by the Society at the Crystal Palace next spring, the Apparatus Section this year, although containing one or two features of novelty and merit, is a very small one. J. H. Dallmeyer, Limited, secure a medal for the new stigmatic lenses *f*/6, which have been already described in this Journal. The Bridges-Lee photo-theodolite is exhibited by Louis Casella. It is an instrument for use in photographic surveying, and the example in the Exhibition is an excellent specimen of workmanship. The camera is such that when the instrument has been accurately levelled, the negative itself bears a record of (1) the principal plane, (2) the horizontal plane of the instrument, (3) the magnetic bearing of the principal plane, (4) the principal point of the perspective, and (5) a true scale of angular distances right and left of the principal plane. Other notes can also be recorded.

Thorn & Hoddle show their improved acetylene-gas generator and burner for the lantern. Messrs. Shew exhibit various forms of the Xit camera. E. Sanger Shepherd sends a frame of specimens of dyes, which, in view of the interest now manifested in orthochromatic and three-colour work, should prove very instructive. The dyes are sealed with balsam between glass plates, and are of various strengths of colour, being selected from a series made for the purpose of preparing an atlas of the spectrum absorption of various colouring matters suitable for modifying the action of light on photographic plates and recording the extent to which they fade when so mounted.

Mr. Ives's exhibit, or rather exhibits, for there are several of them, will probably be that which will attract the most attention. In addition to the kromskop, which is now getting pretty well known, we have a combination of that instrument with the Welsbach light, intended for public exhibitions, which is provided with an ingenious arrangement by which the spectator turns on the light while looking in the photo-chromoscope, the light extinguishing itself as soon as he leaves go of the lever. Another exhibit relating to the same matter is the triple camera, by means of which the three-colour negatives are prepared. There is also on view an optical lantern attachment, designed by Mr. Ives, for three-colour projections, a single source of light being employed. By a most ingenious system of mirrors the light, after passing through the single condenser, is divided up and sent through the colour screens and the triple slide, and the three images so obtained can be shown on the screen, either side by side or perfectly superimposed at the will of the operator by merely moving a lever. This instrument will be shown in operation every evening that the Exhibition is open at half-past seven, and should prove a most interesting and popular feature of the show.

We have now drawn attention to the principal features of the Exhibition, but we have no doubt that further visits and a more elaborate study of the pictures on the walls would result in our finding many others worthy of a place in our notice, but the claims on our space are too great to admit of our dealing more at length with the show on this occasion. The general feeling as we left the room on "Press" day was one of satisfaction that the old Society, in spite of its many detractors, has managed without the help of these gentlemen to get together such an Exhibition as the present one, the general verdict upon which, and

one we ourselves certainly endorse, seems to be that it is by far the best the Society has ever held.

The old complaint, that there is no one picture standing out beyond the others, will, of course, be raised again, but the other way of expressing the same truth (that, on this occasion, it cannot be said that there are only one or two pictures worth looking at), is far more accurate. The Exhibition is one in every way worthy of the position the Society has achieved and of its largely enhanced reputation in its later years, and it only remains for us to express the hope that the appreciation of the public will enable it to result as beneficially to the finances, as it undoubtedly will be in general credit, of the Society over which the Earl of Crawford presides.

THE PREPARATION AND TREATMENT OF MATT-SURFACE PAPER.

Herr Von Norath gives, in the *Deutsche Photographen Zeitung*, the following useful summary of the various processes by means of which matt-surface papers may be prepared; and, as he points out, they are at the present time preferred for artistic work to any with a high glaze.

The simplest form of matt paper is the old salted paper, which is an ordinary paper with a sizing of gelatine, agar-agar, or arrowroot, which is very weak, and contains some chloride salt. The nature of the chloride, and the proportion in the paper, is of considerable influence on the character of the print. Papers which have an excess of silver nitrate are, to a certain extent, the more sensitive the more chloride they contain; beyond this point, however, a slowing action is apparent. Such very sensitive papers give prints more of the character of emulsion papers, that is to say, they give more vigorous prints. A paper with small proportion of chloride gives the opposite effect.

The proportion and kind of chloride used have considerable influence on the final tone of the prints; thus a strongly salted paper gives dark tones, whilst a weak salted gives brighter tones. Sodium chloride gives blue-blacks, barium chloride violets, ammonium chloride bluish, and calcium chloride reddish tones.

The brilliance of the prints can, however, be considerably increased by adding to the salting bath a certain quantity of potassium bichromate, which tends to give harder results. In order to keep the paper for some time after sensitising, either citric or tartaric acid should be added to the salting solution. The prints on this paper do not print bluish, but brick red or brown, and they are not so suitable for platinum toning as those which print blue-black.

Hardwich's formula for salting plain paper is—

Citric acid	7 parts.
Ammonium chloride	7 ,,
Gelatine	1 ,,
Water	300 ,,

First dissolve the acid, and neutralise with carbonate of soda, about 16 parts being required; allow the gelatine to swell in water, and then melt by the aid of heat. The solution should be used warm, and the paper allowed to float for two minutes. A ten per cent. silver bath should be used.

Arrowroot may be used instead of gelatine, as in following formula:—

Ammonium chloride	8 parts.
Carbonate of soda	13 ,,
Citric acid	4 ,,
Arrowroot	12 ,,
Water	600 ,,

The arrowroot should be first made into a cream with a little water, and then 450 parts of boiling water added, and the whole allowed to boil for about five minutes, or till it clears. In the remainder of the water the salts should be dissolved, and added to the arrowroot whilst it is hot. The whole should be well stirred and filtered, and it is ready for use.

The most even and best matt paper is obtained by using agar-agar, but it is rather more difficult, as it can only be used in the form of a jelly, the composition of which is as follows:—

Sodium chloride	6 parts.
Agar-agar	6 ,,
Water	300 ,,

The agar-agar is allowed to swell in cold water for half an hour, then heated and boiled for ten minutes, and the salt, dissolved in a little water added. The solution should be kept warm, and allowed to stand for half an hour so as to let the coarser particles settle to the bottom; the clear should be decanted, and pressed through a piece of coarse muslin into a dish, and allowed to cool. To salt the paper about 230 grains are required for a sheet of paper 24 × 17½ inches, and it should be evenly distributed over the paper by a soft camel's-hair brush.

The above give papers suitable only for vigorous negatives. For negatives of medium density 1 part of ammonium chloride should be added to every 60 parts of water. If platinum black tones are required, a small quantity of bromide should be added thus:

Ammonium chloride	50 parts.
Potassium bromide	1 part.
Potassium bichromate	0·3 ,,
Water	1000 parts.

The paper should be salted by immersion for four or five minutes. If the paper is to be kept, a citrate of silver bath should be used. After silvering, the paper appears more or less an intense rose colour, through the formation of a small quantity of silver chromate, especially if the bromide is omitted, which gives a faint yellowish colour.

Printing on all the matt papers prepared as above must be fairly deep, and this must be considered in connexion with the toning bath that is to be used, as some reduce the prints much more than others. Alkaline gold baths weaken most, chloro-platinite baths less, and the sulphocyanide bath not at all.

Nothing is better for the salted papers than a combination of gold and platinum toning, or a simple gold bath.

The platinum bath is made as follows:—

Chloro-platinite of potash (one per cent. sol.)	10 parts.
Acetic acid	2 ,,
Water	100 ,,

The prints should be well washed, and toned in this till they are blue when looked at, but reddish by transmitted light, and should then be placed in a three per cent. solution of washing soda, and then placed in the following:—

Chloride of gold (one per cent. sol.)	10 parts.
Ammonium sulphocyanide	5 ,,
Water	150 ,,

till the reddish colour has almost disappeared. Experience alone can tell how far to carry toning. If toning is carried too far, the prints are blue-black, but when correctly toned, a brownish black. If a deep blue-black is required, it can be more easily obtained by using—

Chloride of gold (one per cent. sol.)	20 parts.
Phosphate of soda	3 ,,
Water	200 ,,

This bath must be mixed an hour before use. Prints on plain paper should be well rolled, as this considerably improves their appearance.

Platinotype paper is the next matt paper to be considered, and there are three kinds—hot bath, cold bath, and printing out. The hot-bath paper requires less time for printing, and shows also a tendency to brown in the prints. Hübl recommends for the preparation of the hot-bath process for a paper sized with gelatine—

Chloro-platinite solution (1 : 6)	4 parts.
Ferric-oxalate solution	6 ,,
Oxalate-gelatine solution	1 part.

For thin negatives a few drops of a one per cent. solution of potassium bichromate should be added to 185 minims, which are sufficient for a sheet of paper 20 × 26. Development is effected by floating on a solution of potassium oxalate 1 : 3, heated to about 60° C. Though variations in the temperature give different effects, the hotter the developer the flatter the print, and the colder the harder it will be.

For the cold-bath paper Lainer recommends a formula which can be considerably modified to suit the negatives:—

Chloro-platinite solution (1 : 6)	60–72 parts.
Ammonium ferric-oxalate solution	60–48 ,,
Distilled water	10–40 ,,
Gum arabic	5 ,,
Ammonium bichromate (one per cent. sol.)	1–3 ,,

For the printing-out paper the following is the best formula:—

A.

Potassium chloro-platinite (1 : 6)	10 parts.

B.

Ammonium ferric oxalate	40 parts.
Potassium oxalate (five per cent. sol.)	100 ,,
Glycerine	3 ,,

C.

Solution B	100 parts.
Potassium chlorate solution (1 : 20).....	8 ,,

To make solution B, heat the oxalate solution to 40 per cent. C, and dissolve the ammonium salt in it; allow to cool, filter and add the glycerine.

For ordinary negatives, 5 parts of A, 6 parts of B, and 2 parts of C should be used; for hard negatives the quantity of C should be reduced, and increased for thin negatives. Instead of C, Houchiaus suggests the use of bromine water, and, for a sheet of paper, uses 50 drops of A, 60 drops of B, and from 2 to 10 drops of bromine water.

Matt albumen paper gives excellent results, and Hübl's formula for this is as follows :—

Whites of eggs are beaten up in the usual way, allowed to stand for several hours, then filtered, and two per cent. of salt added. A two per cent. solution of arrowroot should also be made by heat in the usual way, and two per cent. of salt added to this. To prepare the paper these solutions are mixed in varying proportions, and the greater the proportion of albumen the more brilliant and vigorous the prints; the proportion may vary from equal parts to 1 of albumen to 4 of arrowroot. The paper should be fastened by the corners to a flat board, and the mixture evenly spread all over it by means of a broad brush, and then the marks evened out with a dry distributing brush, which should be worked all over the paper in circles till all surface glaze has disappeared. For sensitising, about an eight per cent. silver bath should be used, and 2 parts of citric acid added to every 15 parts of silver. This paper is specially suitable for platinum toning, and the platinum bath should be neutral and not acid, or else the whites will suffer.

Matt collodion paper can be prepared by first sizing the paper with chrome gelatine, and then, when dry, stretching in a coating frame, and coating with the following collodion :—

Dissolve by shaking 10 parts citric acid in 1000 parts of a two per cent. raw collodion; dissolve, also, 3 parts of ammonium chloride in 15 parts of distilled water, and add 60 parts of absolute alcohol, and 12 parts of glycerine; shake well, and add gradually to the collodion. Dissolve 25 parts of silver nitrate in 25 parts of boiling water, and add 100 parts of hot alcohol and add to the salted collodion, shake well and add 200 parts of alcohol, and allow to stand for two hours and filter.

The best toning bath for this is Bühler's, which is made by dissolving 5 parts of chloride of gold in 280 parts of hot distilled water, and adding 50 parts of strontium chloride and heating to 98° C. Dissolve also 12–15 parts of potassium sulphocyanide in 250 parts of distilled water, heat to 98°, C; mix the two solutions, shaking well, allow to cool, filter, and wash the filter with 100 parts of distilled water. For use, from 5 to 8 parts of this stock solution should be diluted with 100 parts of water.

A NOTE ON INVENTIONS.

The certainty with which, from time to time, new inventions of old-time ideas and arrangements crop up in this Journal cannot fail to be a source of amusement, as also the neat way the Editor (evidently born for the purpose) has of letting all these well-meaning folk down gently. Recently an excited amateur approached me relative to a "splendid idea" he was going to protect, namely, a small tablet let into the framework of dark slide, upon which to write particulars of exposure. Being under the impression that this idea was a bit old, I made an exposure of *him*, the result being a loss to the revenue of one guinea.

Just a few weeks since, we had an invention relating to mounts, which was going (enthusiasm was "writ large" on the face of the specification and accompanying letter) to revolutionise the whole system of mounting photographs. The practice of pasting the mounts instead of the prints was in vogue—still is, I hope—in several establishments, to my knowledge, twelve or more years ago. Without some such method, how are we to get mounted photographs, portraits in particular, without a certain amount of distortion? That many professional men fail to adopt the plan is a fact, and their loss.

Mr. Knights Whittome's invention belongs to the good old days of the oblong camera—the camera with, and sometimes without, the folding central partition. People, myself included, found they could do the thing quicker, get the same result—that is, without having to fix this wee-bit troublesome adjunct. Now, I wonder how many people invented Mr. Whittome's invention? My little arrangement was made of cigar-box wood, blackened, and with an edging of velvet.

Some few years ago, when we had a very limited choice in cameras and work-room accessories, one was almost *obliged* to invent now and then in order to keep up with one's requirements or to ease labour. It was of no use rushing off to the dealer for the latest drying rack or washer, you had to start and make one. About a month ago there was yet one more "reversing tripod top" invented, at least I read a description of one (just placed on the market) in a contemporary of the Journal. Whenever I read of any one inventing a new "reversing tripod top," it touches me on a rather raw spot, for I feel as sure as man can be that I invented this thing early in 1882, viz., an arrangement whereby the camera could be pointed and fixed upwards or downwards, vertical or horizontal, without unscrewing; an improved (?) version of it is illustrated in a list of my own of 1887 and other catalogues of that date or earlier. One would really imagine from these resurrections that a contrivance of this sort is the very thing photographers are clamouring for; I wish I could conclude that they are, but I have grave doubts. As we know, most cameras were made oblong in shape, and to take vertical or horizontal pictures as might be required, it was necessary to screw the camera to the tripod head in one or other of those positions, this being, of course, prior to the reversing-frame era. When working in the field, it was a very usual thing, in the anxiety to ascertain on the ground glass which position suited the subject best, to alter the position of the camera, by unscrewing more than once before coming to a final decision—a great waste of time—so much so, that contrivances for examining the landscape, view-meters and the like, were sold and made use of prior to erecting the apparatus. My reversing top was designed to instantly change the position of screen by a bodily reversal of camera, which was already screwed to the top; it was in practice very much quicker than the reversing frame, now so universally employed. I got several of these "tops" made, and, as the song says, "of course there is a moral, and of course it's at the end," I will narrate the same for the benefit of all inventors—the innocent ones, if there are any left! It is an old tale about the traveller with the patched "breeks" who got a native worker, Jap or Hindoo, it doesn't matter which, to make him a new pair, which, when delivered, displayed patches neatly stitched in as per sample. Well, having sent off my pattern to a firm who made a speciality of such work, "Inventors' ideas and designs faithfully *executed*," &c., the said pattern being a workable article but somewhat clumsily, not to say humbly, made, with a request for a dozen similar to pattern but as much lighter and neater as possible, I received in due course a consignment of exact replicas, only heavier by a few ounces, scarcely a rough edge but had been reproduced, even to a curious admixture of steel and brass screws with the heads all different ways, quite in amateur style, for I remember the *brass* screws ran short, and I was in a hurry to make my fortune. However, heavy as they were, they were serviceable; one was posted to the Journal office; but, as it was never heard of afterwards, it is presumed that it was mistaken for a brickbat or new firelighter, and relegated to the kitchen department. To resume, my experience with cabinet-makers was not very fortunate, as I have indicated, but, as the event proved, it was better than that which followed, for, having a friend connected with a big firm of apparatus-makers who was "rather struck" with the idea, I consented to "let him have it" it was to be patented, neatly made, &c., and I was to receive "royalty;" a pleasant little dream of frequent and comfortable cheques followed, but from that day to this I have seen never a halfpenny's worth of royalty. Of course, just at this time the "reversing back" was beginning to boom, and, the fact was the reversing or reversible top was not wanted by the makers.

There are many things to be said in favour of the old-style oblong camera—the compact, neat, sizable article as turned out by the best makers; there was the long sliding front with the big scope it gave you for architectural work; we get nothing equivalent to this in the modern square tapering bellows camera; there was no "sagging" of bellows, and the camera was none the worse for being fitted, as it was usually, with *short* bellows. The new up-to-date outfits do not turn out better work than did the old. Take it all round, it is debatable whether the modern camera is, as such, any better than its predecessor; a tripod head of proper build will do everything we want as regards a quick reversal of position; this done, and it is done in a twelfth part of the time taken to remove and reverse the usual back, what advantage has a square over an oblong camera, that is to say, one more nearly approximating to the size and shape of the plate? Why carry a framework of camera nearly nine inches square for a plate which only measures $6\frac{1}{2} \times 4\frac{3}{4}$? In addition to these few matters there is to be considered the rackwork focussing, which is better in all cases done at the back, not the front, and the question of bellows, which should always be parallel.

J. Pike.

Our Editorial Table.

Photographic Enlargements: How to Make Them. Price 1*s*.
By Geo. Wheeler. Manchester: Geo. Wheeler & Co., 46, King-street West.

A fifth edition of Mr. Wheeler's book has been reached, and a copy has been sent us. It is one of the most practical and useful handbooks that we have read. The author, who is well known as a skilful photographer, has the rare quality of being able to impart

his knowledge to others in direct and simple language, and the result is a reliable guide to enlarging on carbon, bromide, opal, Alpha paper, &c. Day and artificial-light enlarging are exhaustively considered, the necessary apparatus is figured and described, and the whole procedure, from the production of the negative to the completion of the enlargement, is conscientiously set forth. It is altogether a work to recommend to photographers undertaking their own enlarging and needing a safe and practical handbook.

THE Eastman Photographic Materials Company send us a copy of the report which has been issued by the Eastman Kodak Company, giving the results of their window-display contest. This contest was for dressing windows with Kodaks, &c., and the report contains several illustrations of the successful windows.

CATALOGUES RECEIVED.

MR. WILFRED EMERY, of 3, Soho-street, Soho-square, W., in sending us his price-lists for developing, retouching, printing, copying, enlarging, &c., also cameras, lenses, tripods, chemicals, dry plates, papers, &c., draws attention to the special discounts to photographic dealers which he is allowing.

Andrew H. Baird, Lothian-street, Edinburgh.

THE catalogue before us is not concerned with the photographic side of Mr. Baird's business, but is devoted to chemical and physical apparatus. It consists of sixty-six pages, and is freely illustrated. A glance through its pages makes clear the fact that the catalogue is especially useful for reference by chemists and physicists, as scarcely an article in use in the scientific laboratory is omitted.

ILLUSTRATED CATALOGUE OF THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Published at 12, Hanover-square, W., and at Harrison & Sons', 59, Pall Mall. Cloth bound, 1s.

THE Catalogue of the Royal Photographic Society's Exhibition is issued neatly bound in cloth, thus rendering it suitable for inclusion in one's photographic library. There is no doubt that in years to come a series of these illustrated catalogues will be highly prized for reference. Let us imagine that the Exhibition had always been illustrated in the catalogue. What an invaluable record of pictorial photographic progress it would have been made! In the catalogue before us twenty-two of the pictures are reproduced in line and thirty-two in half-tone. The selection has been made with extremely good judgment, and the book, as a whole, evidences the painstaking care of Mr. Child Bayley, who is responsible for its production.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, October 6, at eight o'clock, Discussion: *Has Photography Benefited by the so called "Artistic" Element?*

HACKNEY PHOTOGRAPHIC SOCIETY.—The particulars to date *re* the Exhibition arrangements are as follow: To be held at Morley Hall, Hackney, for three days, viz., November 16, 17, and 18. Judges, Messrs. F. A. Bridge, J. A. Sinclair, and E. J. Wall. Hanging Judge, Mr. A. Mackie.

THE Prestwich Manufacturing Company is the name under which the Moto-Photo Supply Company, of 744, High-road Tottenham, N., will in future trade. Their specialities are cameras, projectors, perforating machines, developing outfits, and every accessory connected with animatography.

MESSRS. H. J. REDDING & GYLES have recently removed to 3, Argyll-place, Regent-street. Mr. Redding was for over twenty-five years with Messrs. J. Robinson & Sons, of Regent-street and Dublin, and is the inventor of the well-known Luzo hand camera, which is among the many specialties of the firm.

Pearson's Magazine for October will have for its chief feature a dramatic story by Robert Hitchens, illustrated from photographs. Another feature, which comes rather late, but will probably be utilised in the November celebrations, is Canon Rawnsley's series of photographs of *Bonfires in Full Blaze*, with diagrams showing how a bonfire should be constructed.

A FEW months ago the world was startled by the suggestion of an optimistic oculist that the blind might be made to see by means of the X rays. Now it appears, from a correspondent of the *New York Sun*, that these sanguine hopes have been, at any rate in part, fulfilled by Dr. Astudillo, of Havana. The man who has been cured was originally a resident in Madrid, and was suddenly stricken blind twelve years ago. Eventually he went to Cuba, where he gradually got poorer and poorer, until, finally, he was reduced to begging. It was while soliciting alms that he came across Dr. Astudillo, an oculist, who invited him to his house in order to see if anything could be done in his case. After various experiments with the X rays, the patient was able to see different objects which were placed in the light. After further treatment he became able to differentiate between black and white in the daylight, and gradually to see and describe the machinery of the apparatus, as well as count the flashes of the incandescent lamps in the physician's study. It is to hoped that this interesting story will be confirmed in every particular.—*Daily Chronicle.*

SOLDERING ALUMINIUM.—A new solder for joining articles, sheets, &c., has been brought out in the United States under the title of Green's aluminium solder. It is stated to be composed of zinc, 50·03 per cent.; tin, 47·99; aluminium, 1·76; and phosphorus, 0·22 per cent. It is not used with any flux, simply requiring the aluminium faces to be cleaned and first coated with the solder, then a clean hot soldering bit is used to wipe the soldered joint to be made.

CITY OF MANCHESTER MUNICIPAL TECHNICAL SCHOOL.—Session 1897–98.—For the subject of photography the lecturer is Mr. C. F. S. Rothwell, F.C.S. The courses are: First Course, Monday, 7 to 8.15; Second Course, Monday, 8.15 to 9.30. Fee, 7*s.* 6*d.* for each course. The first course comprises thirty lectures, and is suitable for those just beginning the study of the subject, either as apprentices or amateurs; whilst the second, or advanced course, also comprising thirty lectures, is intended for those already familiar with the processes described in the first course. The lectures will be illustrated by the most modern apparatus, and each process will be practically demonstrated. Towards the end of the session it is intended to arrange a few photographic excursions, to take place on Saturday afternoons. Text-book is *The Science and Practice of Photography*, by Chapman Jones.

THE Blairgowrie and District Photographic Association will hold its Second International Exhibition from January 17 to January 22, 1898. The Judges will be Mr. Craig Annan and Mr. W. Crooke. The following are the classes: Open Competitions.—Class A, Champion Class for previously medalled pictures.—Class B, Champion Class for previously medalled lantern slides.—Class C, Lantern slides (in sets of four). Open to professionals.—Class D, Landscapes or seascapes.—Class E, Figure studies and portraiture. Open to amateurs.—Class F, Landscapes or seascapes.—Class G, Figure studies or *genre*.—Class H, Hand-camera work (moving figures). Open to members.—Class I, Any subject. Best exhibit of photographic materials (prizes awarded for "general excellence"). Entry forms and particulars may be obtained of the Hon. Secretaries, Mr. T. C. Gorrie, Rattray, or Mr. J. B. Maclachlan, Blairgowrie.

EASTMAN PHOTOGRAPHIC EXHIBITION.—The time for receiving prints and lantern slides for the competition has been extended to October 9. The Exhibition will take place from October 27 to November 16 at the New Gallery, 121A Regent-street, and it will include, in one room, the competition prints; in another, an exhibition of appliances connected with film photography and the use of the Kodak; in a third room, a varied show of technical and instructive photographs; and, in a fourth room, a selection of enlargements made by the Eastman Company from negatives by some of the leading exhibitors of photographic pictures in England. Over 7000 photographs have already been received for competition. The rooms devoted to the pictorial sections will be specially decorated by one of the most original designers of the day in attractive schemes as to colour and quality of hangings, and the frames will also be designed by the same artist, and disposed so as to harmonise with the schemes of decoration. In the scientific department X-ray demonstrations will be given, showing the use and convenience of the Eastman X-ray paper when employed in place of plates in surgical and other cases.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
4.....	Bradford Photo. Society	*Intensification and Reduction.* J. McIntosh.
4.....	Gospel Oak	Social Evening.
4.....	South London	*Portraiture* Harold Baker.
5.....	Aintree	Mountain Scenery.
5	Hackney	*De elopers and Developing.* Ethelbert Henry, C.E.
6.....	Borough Polytechnic	*Aerograph Retouching with Liquid Colour.* Charles L. Burdick.
6.....	Croydon Camera Club	Short Address by the President—*Photographic Advances.* T. C. Hepworth, F.C.S.
6	Leeds Camera Club.....	Affiliation Lecture.
6	Photographic Club	Discussion: *Has Photography Benefited by the so-called "Artistic" Element?*
7.....	London and Provincial.....	*Meran, South Tyrol.* A. L. Henderson.
7.....	Woodford	Informal Meeting: *Under and Over-exposure.*
8.....	Borough Polytechnic	*Bromide Printing.* H. C Pheleox.
8.....	Croydon Microscopical	Affiliation Lecture: *Architectural Photography.*
9.....	South London	Excursion: St. Paul's Cray. Leader, H. Esler.

ROYAL PHOTOGRAPHIC SOCIETY.

SEPTEMBER 28,—Technical Meeting,—Mr. H. Snowden Ward in the chair.

APPARATUS AT THE EXHIBITION.

The meeting was devoted to the explanation and examination of the apparatus included in the current Exhibition.

Mr. E. CLIFTON described the exhibits of Messrs. J. H. Dallmeyer, Limited, comprising a case of the new stigmatic lenses, *f*·6; a frame of three 12×10 negatives, showing the performance of a half-plate (7·6 inches focus) stigmatic (*f*·6) lens upon 12×10 plates; and a half-plate *f*·6 lens (7·6 inches focus) on a 10×8 camera. The lens, which has already been fully described in these pages, has received a medal at the Exhibition, and is in application practically four lenses in one—a moderate-angle lens for ordinary work on the plate for which it is intended; a wide-angle lens when worked upon a plate two sizes larger; the front lens, when screwed into the back cell, forms a single land-

scape lens one and a half times the focal length of the entire combination, the diaphragm being set to *f*-11; and the back lens forms a single landscape lens twice the focal length of the entire combination, the diaphragm being set to *f*-8

Mr. HODDLE (Thorne & Hoddle) exhibited the Incanto Improved Acetylene Gas Generator, which was now made with a cone and connexion added to the gas-holding chamber, the use of which prevents any dangerous admixture of acetylene gas and air, and also a safety outlet, allowing any surplus gas (if made) to be conducted by means of a flexible tube into the open air. The generator had been set fire, and had been subjected to every possible test, without any ill effect. He also showed an improved three-burner lantern fitting for use with acetylene gas.

Mr. J. H. GEAR asked whether the new form of generator met the approval of insurance companies.

Mr. HODDLE replied that the companies now permitted the use of a small generator of this type on insured premises, provided it did not hold more than four pounds of calcium carbide, and the County Council permitted the storage of five pounds of the carbide without a licence.

Mr. E. SANGER SHEPHERD showed sixty sealed screens in various strengths of colour, selected from a series made for the purpose of preparing an atlas of the spectrum absorption of various colouring matters suitable for modifying the action of light on photographic plates, and recording their relative fastness to light when sealed with balsam between glass plates.

Mr. F. E. IVES, in describing his exhibits, dealt at length with his optical lantern attachment for three-colour projection with a single source of light, designed to project the photo-chromoscope images, or colour discs, side by side on the screen, separated or partly superposed, or to superpose and register the images by the movement of a lever. In this apparatus the parallelised rays from a condenser are divided into three portions by means of transparent reflectors, and sent through the three positives and three objectives. A demonstration which was subsequently given was loudly applauded. Mr. Ives's other exhibits included a combination of the photo-chromoscope and an illuminating device, intended for public exhibitions, and his triple camera for making three images or three stereoscopic pairs of images on one sensitive plate at one exposure.

Mr. J. BRIDGES-LEE explained his photo-theodolite, the essential idea of which, he said, was to be able to obtain photographs which should bear upon the face of them all the elements necessary for their interpretation for map-making purposes, so that it might be possible to determine the angular bearings of all points in the picture with reference to the particular station at which the camera was placed at the time it was taken. From time to time, in many parts of the world, a great deal of attention had been given to the subject of photogrammetric measurement, and especially upon the Continent, where it originated; but most of the practical work hitherto done has been achieved in recent years in Canada. Mr. Deville, the Surveyor-General of Canada, has under him a body of surveyors specially trained in this method of interpreting photographs for map-making purposes; and they have surveyed, entirely by the photographic method, large tracts of country along the course of the Canadian Pacific Railway. This work, however, has been done with ordinary theodolites, and with cameras specially made to supply certain necessary elements; but the idea of recording upon the face of the picture itself all the particulars required originated, Mr. Bridges-Lee said, with himself, and he proceeded to explain in detail the construction of the photo-theodolite, which he has designed for this purpose. The mechanism is so arranged that, whenever a photograph is taken (the instrument having been first accurately levelled), there will be recorded on the picture: (1) the principal plane; (2) the horizon plane of the instrument; (3) the magnetic bearing of the principal plane; (4) the principal point of the perspective; (5) a true scale of angular distances, right and left of the principal plane; and there may also be recorded, at the will of the operator, notes relating to (*a*) altitude of the station, or barometric pressure; (*b*) station number; (*c*) serial number of the photograph; (*d*) descriptive mark of any distant object bisected by the principal plane; (*e*) date; (*f*) time, &c. The apparatus is most beautifully made by Mr. L. P. Casella, of Holborn Bars, and the description of its various details was followed with much interest. In reply to questions, Mr. Bridges-Lee said he preferred to use an isochromatic plate and a chromium green screen; the plate should possess a very fine grain, and he got the best results with a ferrous oxalate developer.

Mr. J. F. SHEW'S exhibits (spectacle lenses, "Xit" cameras, &c.) were examined in his absence, and the meeting closed with a vote of thanks to the exhibitors.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 23,—Mr. A. Haddon in the chair.

Mr. A. L. HENDERSON drew the attention of the meeting to a large number of examples of Taber's relief photographs, which were displayed around the room. The prints appeared to be in platinotype, which was one of the most suitable papers for the embossing process involved, and it was pointed out that the method was applicable to any existing photograph, which could be finished and mounted in similar relief at a very moderate figure. Several speculations as to the nature of the operations necessary to the production of the effect were offered.

Mr. R. BECKETT exhibited and described his new hand and stand camera (5×4 size), for use with the new stigmatic lens. The camera proper was fitted with Thornton-Pickard shutter, rising and cross front, and a back allowing of double swing, besides focussing arrangement. The dark slides were of the American pattern, the sliding shutter drawing right out, and a safety flap excluding all stray light, a device which is well enough known. The stigmatic lens, as described before, allows of three different foci being used, according to the will of the operator, by separating the combinations, and using either the front or back alone or together. By this means, and the provision of a second lens, four different foci, including a lens of wide angle, are combined in the camera.

Mr. W. D. WELFORD, referring to the production of red tones on bromide paper by considerable over-exposure and an abnormally restrained developer, to which he had alluded on another occasion, showed a print made in that way some fifteen years ago. He also passed round two prints, one of which was printed from the negative in the ordinary course, with its natural sky, as taken at the time on the same plate, and the other with a sky printed in from another negative, which he ventured to think was a great improvement on the former, notwithstanding certain remarks in favour of combining both sky and subject in one negative.

Mr. SANDERSON, whose name is well known in connexion with improvements in cameras, brought forward and described the principles of his apparatus. This camera and its peculiarities have been fully described before, but, briefly, the points are as follows: The front is supported independently of the base by two struts on each side, swinging from two slightly removed points on the baseboard. The front is held by two clamping screws, each passing through longitudinal openings in the two struts on either side, and is divided into three distinct pieces—a rotating portion, a form of sliding front, and the supporting piece of all. By this means the lens can be brought to any part of the camera front. By showing it on this occasion Mr. Sanderson hoped to remove any false notions about the value of the device which might have taken root. The chief feature of the up-to-date camera was to be able to combine all movements in one simple action, and it would be noticed, he said, that the swing back had been done away with in his camera. He proposed to work with the camera back vertical, and the tripod head level, the other movements being obtained by simply loosening the clamping screws, and moving the front, by which means the adjustment of the image and rough focussing could be done. The camera possessed special merit for its capabilities in architectural work, which tried the qualities of a camera more than any branch of photography, because a greater range of movement is required. The idea affords an enormous rise of front—more than one is likely to require, and, apart from this rise, counteracts the necessity of the swing back inasmuch as, if the lens is lifted above its covering power it can be instantly tilted, and the axis of the lens directed to the centre of the plate. For wide-angle work the back can be brought well forward on the baseboard, and allows of the use of a lens of two inches focus, if required. The perfect rigidity of the front was proved by inspection and trial during the explanation by Mr. Sanderson. In reply to a question as to the means of assuring oneself of the perpendicularity of the front, it was stated that a number of the cameras were fitted with a plumb for the purpose. There was some question as to the extent of the rise, and Mr. Sanderson said he could lift one of the Zeiss Series V. lens, to the covering power of which he could bear witness right beyond its covering power. The camera shown was a 10×8, with an extension of twenty-one inches, and it is made in all sizes, from half-plate to 12×10.

Mr. EVERITT said that, for a conical bellows camera, this form gave more latitude than any he had seen. The curse of modern camera-making had been the conical bellows, but this certainly removed the greater part of the objection.

Mr. SANDERSON observed that it could be looked upon as a square bellows, and not conical, in practice, and he went so far as to say that more could be done with it than with a square form of bellows—the lens could be placed lower, for instance.

Mr. EVERITT was not convinced, however, and argued the case with Mr. Sanderson.

The CHAIRMAN asked as to the possibility of the application of Mr. Sanderson's principle to existing cameras, which would be a still further advance, in addition to those enumerated.

Mr. SANDERSON said he should not recommend the attempt unless it could be thoroughly carried out.

PHOTOGRAPHIC CLUB.

SEPTEMBER 23,—Trade Night,—Mr. Haes in the chair.

A representative from Messrs. Watson & Sons showed a portable studio stand. It resembles a strong tripod with the tilting table arrangement of the ordinary studio pattern. The legs are fastened together by a triangular piece of wood upon which are screwed three castors. The table lifts off, the tripod slides up in the usual way, and the triangle folds flat. He mentioned that it was used by Mr. Alfred Ellis for studio work and for interiors. The price was announced to be 5*l*.

Mr. BRIDGE said he had used a very similar stand for lantern work quite twenty years ago, his being made by Mr. Oakley.

Mr. SINCLAIR thought it an excellent stand, and, considering the workmanship, not at all dear.

The general opinion seemed to be that it was very rigid, but somewhat heavy to carry about.

Mr. David Allan's representative showed a drying box for negatives, which when not in use folds flat, and is then only one and one-eighth of an inch in thickness. The size shown takes twenty-four quarter-plates, but other sizes are made. The body, round which is a fine gauze material, folds in half, and the lid of the box forms the top. This ingenious and convenient accessory attracted a good deal of attention and favourable comments.

Mr. BRIDGE introduced Mr. Sanderson, of camera fame, who had come specially from Cambridge to demonstrate his patent front. He claimed no new principle, but had simply introduced a new mechanical device, which simplified the various operations. It was not only an added power in architectural work, which formed the most severe test for a camera, but it was a convenience in several other directions. The front has a universal movement, and this enables the tripod to be set square and the back perfectly vertical, all changes being effected from the front. No tilting of the camera was required. It was a convenience also when changing lenses of great variation of focus, as the slow racking out of the camera was avoided, the front being placed immediately at any distance from the back. Mr. Sanderson said he was doing work every day that had not been attempted before.

A member asked if the camera could be used for a very short-focus lens, and Mr. Sanderson immediately placed the front at about two inches from the back.

Considerable interest in the samples shown was taken by the members, many of whom, upon testing, said they would not have believed that the front could be so rigid had they not felt it themselves.

Mr. CLIFTON and Mr. MACKIE expressed themselves quite surprised at the firmness and steadiness of the whole camera, and it was the universal opinion that it was the best and most convenient camera the members had ever seen.

One member said probably it was due to the fact that Mr. Sanderson was a practical professional photographer, and knew what was wanted.

Mr. Clifton showed a new lens by Dallmeyer for projecting animated pictures, which worked at the enormous aperture of *f*·2.

Mr. BRIDGE said they would get one at "*f* nothing" directly, but Mr. WELFORD went one better, and asked for one at "*f* owes so much."

Mr. CLIFTON said the construction was similar to the Dallmeyer miniature lens.

With a vote of thanks to the representatives, one of the best and most practical Trade Nights the Club has yet had came to a close.

Borough Polytechnic Photographic Society.—The report presented at the Annual General Meeting of this Society, held on Wednesday, September 22, shows some important developments during the past twelve months. The Society has progressed at a rapid rate since the Christmas Exhibition, and nearly forty members have been enrolled since last September. Undoubtedly the feature of the summer programme, and the "success of the season" was the Society's holiday party, when eight members spent a fortnight in South Devon, with headquarters at Sidmouth. Over 500 plates were exposed during the tour, and some results will be shown on Saturday, October 2, on which date the Society purpose holding a social evening. A hearty welcome is given to members of other societies on this occasion, and tickets can be obtained from the Secretary, at 103, Borough-road, S.E. In addition to the ordinary Wednesday lectures and demonstrations, which are this year on a scale hitherto unattempted, a feature of the forthcoming winter session will be the Friday evening practical work amongst the members, the programme for which has been arranged. The winter session and a new year commences on October 6. Subscription, 5*s.* per annum. The following are the officers and Committee for the ensuing year:—*Chairman:* Mr. A. Bedding.—*Committee:* Messrs. H. J. Blane, A. H. Boyce, A. J. Bullock, H. Heath, M. J. Lindsey, W. Mundy, W. Oubridge.—*Librarian and Curator:* Mr. E. J. Hoar.—*Recorder and Lanternist:* Mr. P. C. Cornford.—*Treasurer:* Mr. L. E. Cotterell.—*Secretary:* Mr. F. W. Bannister.—*Assistant-Secretary:* Mr. H. C. Philcox.

Brixton and Clapham Camera Club.—September 22.—A lecture on

AT HOME SUBJECTS

was read by the author, Mr. W. THOMAS, who at some personal inconvenience was kind enough to attend for the purpose. The paper is an especially useful one to those aiming at improvement, its main contention being that, due attention being given to composition and to light and shade, it is unnecessary to make long journeys in search of the picturesque, but that abundant material for pictures can everywhere be found among our every-day surroundings, in town or country, and at every season. The Club expressed regret at the death of Mr. W. H. Harrison, who joined in 1892, being shortly afterwards elected Vice-President, and frequently rendering services both willingly given and highly esteemed. From October 5, weekly meetings will be resumed.

Hackney Photographic Society.—September 21, Mr. E. Puttock presiding.—The HON. SECRETARY gave latest particulars of the Exhibition arrangements. Mr. R. Beckett showed a 5×4 hand camera made to take the Dallmeyer five-and-a-half-inches stigmatic lens, with its three different foci. The camera was made for use with dark slides, and had all desirable movements. Mr. Roofe showed some good 10×8 enlargements on Alpha paper from quarter-plate negatives, the light used being the incandescent gas. A paper by the Rev. F. C. Lambert, entitled

WHY WE USE THE LENS, AND HOW,

was then read by Mr. RAWLINGS, and the diagrams which accompanied the paper were shown on the screen. Much useful information was given concerning the principles of optical projection, the calculation of conjugate foci, &c.

North Middlesex Photographic Society.—September 20, Mr. Henry Smith in the chair.—In the regrettable absence of Mr. Stuart, through illness, who was to have given a paper upon *Various Enlarging Processes*, a general discussion took place on that subject. Messrs. MATTOCKS and S. E. WALL described their methods, the latter gentleman giving a very ingenious method for printing in clouds by fixing a sheet of glass larger than the negative used in front of it, and after exposure marking out the landscape by painting on the glass and then substituting a cloud negative. Mr. MacIntosh illustrated on the blackboard several methods of enlarging by artificial light without condensers. Messrs. H. W. Bennett, Golding and others also contributed to the discussion.

SEPTEMBER 27, Mr. J. C. S. Mummery (the President) in the chair.—Mr. F. A. Bishop and Mr. A. T. Crane were elected members of the Society. Mr. J. W. Marchant, on behalf of the Society, congratulated the President on having gained a medal at the Royal Society's Exhibition. Mr. H. A. MUMMERY then read a paper, entitled

A CONSIDERATION OF MODERN LANDSCAPE ART.

He traced the history of landscape painting, and told how the setting of the old pictures of Madonnas, &c., gradually usurped the place of the principal object, and, until comparatively recently, conventionalism bound artists to always introduce into their landscape angels or nymphs, &c., or some Biblical scene, and that painting a landscape for the beauty of itself alone only came afterwards. A few remarks were afterwards made by Messrs. MacIntosh, Cox, H. W. Bennett, and Lisett, and a hearty vote of thanks to the lecturer concluded the meeting.

South London Photographic Society.—September 20, Mr. W. F. Slater (Vice-President) in the chair.—The evening was devoted to the question of photographic surveys, and papers by Mr. W. JEROME HARRISON and Mr. C. F. FOWLER (Hon. Secretary of the Birmingham Photographic Society) on the subject were read. In the discussion which followed, it was suggested that the Committee should amend the scheme for a photographic survey of South London, which they had formulated two years ago with a view to making same more workable. A considerable number of members signified their willingness to take part in the modified scheme.

Bradford Photographic Society.—September 22.—Mr. W. T. WILKINSON gave a lecture on

LANTERN SLIDES,

which was made all the more instructive by a series of demonstrations illustrating some little-known processes of manufacture. The lecturer very ably illustrated how a makeshift camera for reduction slides could be made from a long narrow box the size of the required negatives, the actual plate being in the camera while the negative from which the reduction was to be made was placed in the distant end of the box, and strongly illuminated by means of two 1*s.* paraffin lamps, and a curved reflector made of cardboard. With regard to contact work, Mr. Wilkinson showed the various kinds of plates which might be used, and extolled their virtues or condemned their vices. One useful hint which he dropped while on this subject was that he always made his exposures under a piece of tissue paper, the top end of which was fitted against the wall, making a sort of flap end through which the frame could be easily slipped. The collodion process—an almost forgotten method to the average amateur—was explained, and created considerable sensation. The CHAIRMAN (Mr. Stevenson), in putting the vote of thanks, said how much he had profited by the lecture, and started the questioning by putting several matters, which were readily answered by Mr. Wilkinson. He also replied to one or two other members in a satisfactory manner.

Leeds Camera Club.—September 22.—Mr. W. Booth, of the Bradford Camera Club, was to have given a lecture, but, owing to illness, was unable to attend. Arrangements had therefore been made to have a lantern-slide exhibition and the cinematograph. Mr. Bourke (President) took charge of the views, representing a tour in Ireland, Mr. Fox acting in a similar capacity for a trip to Paris. Mr. Bourke manipulated the cinematograph, and passed through it some highly interesting and amusing films. Films had also been kindly lent by Mr. Balmford and Mr. C. Palliser. Mr. C. Grayson also rendered able assistance. The members turned up in large numbers, inconveniently filling the club-room.

FORTHCOMING EXHIBITIONS.

1897.		
October 1–13	.....	Glasgow International. W. Goodwin, 3, Lynedoch-street, Glasgow.
,,	1–Nov. 13...	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
,,	4	Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
November 1–6	.....	Brixton and Clapham Camera Club. C. F. Archer, 1, Gauden-road, Clapham, S.W.
,,	22–27	Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.
December 9–11	.....	Aintree Photographic Society.
1898.		
January 17–22	.....	Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
January-February	...	Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 27–May 14	.....	International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Patent News.

THE following applications for Patents were made between September 15 and September 22, 1897:—

PHOTO-MECHANICAL SURFACES.—No. 20,975. "Improved Means of Preparing Photo-mechanical Surfaces Analogous to Collotype and the like." H. SOAR.

MOUNTS AND FRAMES.—No. 20,993. "Improvements in Mounting and Framing Photographic or other Prints and the like." W. WATSON.

TRAYS.—No. 21,012. "Developing, Washing, Toning, and Fixing Trays as used in Photography." H. MONIE, JUN.

PHOTOGRAPHIC WRAPPER.—No. 21,166. "An Improved Photograph Wrapper." A. E. WILSON.

PNEUMATIC SHUTTERS.—No. 21,295. "Improvements in or relating to Pneumatic Devices for Operating or Releasing Photographic Shutters, Applicable to other Purposes." J. P. SWIFT.

MEASURING LENSES.—No. 21,411. "The Optician's Calibre Gauge and Rule for the Measurement of Lenses." W. BANKS.

DEVELOPING APPARATUS.—No. 21,482. "Improved Photographic Developing Apparatus." A. S. COBENZL.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

REDUCING OVER-PRINTED PLATINUM PROOFS.

To the EDITORS.

GENTLEMEN,—I should be much obliged if you would let me know if there is any way of reducing over-printed platinotypes.

There is such an enormous waste in this process, owing to the difficulty in judging their depth before developing, that any discovery in this line would mean a great saving of material to printers.—I am, yours, &c.,

NELSON JENNINGS.

67, *Romford-road, Stratford, E., September* 20, 1897.

[Nitro-hydrochloric acid in the proportion of one part of nitric to four of hydrochloric has been suggested for the purpose and employed with, we believe, slight success. Possibly some reader may oblige our correspondent with a method of greater certainty and effectiveness.—EDS.]

BACKING FOR PLATES.

To the EDITORS.

GENTLEMEN,—As there seems to be an outcry against collodion-backed plates, and as caramel-sienna backings are more or less messy, I venture to suggest a backing which seems to be satisfactory.

I have tried it successfully, as the enclosed samples will prove to you. It is easily made, easily applied, cheap and clean. What more is desirable?

Transparent celluloid	80 grains.
Acetone	3 ounces.
Amyl-acetate	1 ounce.

Mix, and allow the celluloid to dissolve.

This is the foundation of the backing, as the *white film* enclosed shows. It may be coloured yellow, orange, red, or black, or a mixture of yellow and red, or orange and red, could be used, by dissolving about two or three grains of those aniline colours in the solution of celluloid, as the *coloured films* enclosed show.

The coloured solution thus obtained is then flowed over the plate, as was done in the samples sent, or brushed quickly over with a flat dusting brush, laying the plate flat on a piece of pure white paper. When quite dry (if put on over night, it will be dry in the morning) it can, as you see, be peeled off in one piece by first running the point of a penknife along the edge of the plate. It should be applied freely, as the thicker the film the more easily it comes off; but should it tear, and little pieces be left along the edges, do not try and remove them till the plate is fixed and dry, they will do no harm.

Obviously, this cannot be used for films.—I am, yours, &c.,

Croydon, September 21, 1897. J. H. BALDOCK, F.C.S.

THE AWARDS AT THE GLASGOW EXHIBITION.

To the EDITORS.

GENTLEMEN,—I should like to put "One of Many" right on one point in his letter in your issue of September 17, but have left it over for a week that the others of the "Many" may have an opportunity of expressing their interesting discontent before replying. They are silent.

The one point is this: He tries to prove what he seems to think the compromising fact that the Judges knew some of the names of the competitors. So far from thinking this discreditable knowledge, I confess at once that they did. I think, and have found, the affectation of the anonymous in judging (and sometimes, by the way, in writing) so grossly unfair on the one hand, and so like endeavouring to make Judges honest by Act of Parliament on the other, that I decline to judge if the names of the competitors are withheld.

Moreover, anonymity is impossible. It would have been a solemn farce for any Judge who had sufficient experience to justify his election to the office to pretend that he did not recognise a large number of the photographs at Glasgow at a glance.

It is also certainly true that an extraordinary number of medals, a record number in fact, was awarded to one competitor, but it was not the fault of the Judges if one of the greatest photographers happened to reside in Glasgow, and chose to compete in many classes. The mere fact of finding that the best pictures in several classes were by the same man could scarcely be expected to make the Judges think less of them; and, being there, the system of classification compelled the awarding of so many medals to Mr. Annan. The iniquitous system of distributing medals so as to make it as pleasant as possible to everybody is, I hope, played out.

It is true, as "One of Many" says, there are the works of many famous workers exhibited, but he ignores the fact that they are labelled "not for competition." This, unfortunately, has also failed to be noticed in the catalogue.

I have referred to other matters connected with the Exhibition in another column of the present number.—I am, yours, &c.,

Tunbridge Wells, September 25, 1897. H. P. ROBINSON.

THE CHASSAGNE PROCESS.

To the EDITORS.

GENTLEMEN,—Since you write in your last number (1951) about the Chassagne process of colour photography, I will give you my personal experience here in Paris with radiotint, which claims in its circular to be the Chassagne process. Wishing to know if it is as easy as it was represented to be, and with the intention of colouring my views if possible, I went to their headquarters (they have already one agency in Paris) and saw advertised that the working of it was shown free at any time. I then went in and saw a very hastily furnished office and workroom, where I was very politely shown to a clerk to demonstrate to me the easy working. He went for a portrait on albumen paper and sat down in front of it, having before him a glass containing what he called the *colourless fluid* (he told me afterwards that it was plain albumen), three small glasses containing solutions of blue, green, and red colours, also a saucer and two or three sable brushes. He first went with a brush loaded with colourless fluid all over the portrait, this several times, and then blotted the superfluous liquid away with blotting-paper laid flat on the photograph and passing the hand over all. This blotting process is gone over repeatedly. Next he took some blue and mixed it in the saucer with some colourless fluid and passed over the background of the photograph, blotted it, and repeated this several times until the colour suited, each application making it more apparent or deeper. Then he put some green on the face, and so on in the same way as with the blue, washing his brush between different colours.

At this point I interrupted his work, asking if this was the Chassagne process of the selection of colours in a natural way, as was advertised before. He said they did not claim to be the Chassagne process at all; however, they worked the same way as he did and with the same materials, and they did not believe at all in the selection of colours, which was. . . . When I saw this and the way two or three other clerks were working carefully over some views for the show-case, I was fully posted, and quitted.

Polite and obliging they were all, indeed, but it was not what originally the Chassagne process was said to be. The whole outfit for working this beautiful and new process is sold for only twenty-five francs (1*l.*), and is composed of a cardboard box, containing four small bottles of solutions, one colourless fluid and the three others, red, blue, and green colours, two or three brushes, and there you are.

I mentioned before that green was put over the face and also the hair, but this was only a first layer, as all the colours of the face were obtained as well as others, by the superposition of different colours.

And so bursts another bubble, which was to be such a beautiful invention.—I am, yours, &c., X. Y. Z.

Paris, September 24, 1897.

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—I was glad to see "Critic's" letter *re* "The Return of specimens." It is certainly a very serious matter to an operator not to have his specimens returned, but it is far more serious to be engaged (as unfortunately I was) by such a firm as the one in question. When engaged, I had to travel considerably over 100 miles to the place, and, on my arrival, was given the head operator's work to do, having engaged as assistant at assistant's salary. At the end of my first week I had to agree to a reduction of salary or leave. After a few weeks I was discharged for no reasonable cause whatever. My discharge was not entirely unexpected, as there was a change of one or two of the staff each week I was there. Every Saturday it was always a question amongst the staff who would be the one this week. I should think that, if the persons who have cause to complain of the firm would send you the name to publish with their joint signatures, it might do some good. I enclose the name, and, if you think it would do any good, you are at liberty to publish it, providing two others will do the same as I.—I am, yours, &c.,

ASSISTANT.

THE EASTMAN COMPETITION.

To the EDITORS.

GENTLEMEN,—Will you kindly allow us to announce in the Correspondence columns of your paper that the last date for receiving pictures for the Eastman Photographic Competition has been altered to October 9? We have already received more than seven thousand entries, but the time has been extended to suit the convenience of many competitors who would otherwise have been prevented from entering on account of absence during the holiday season.—We are, yours, &c.,

THE EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED.

115 *and* 117, *Oxford-street, London, W., September* 24, 1897.

"COSMOS" AND MR. COE.

To the EDITORS.

GENTLEMEN,—If "Cosmos" is correct in his argument that, because the Queen's English is derived from the Bible, therefore quotations, including an appeal to the Creator, in such a matter as the publicity or otherwise of a colour process, is in good taste and not profane, I shall continue to be glad I am provincial. But this argument of provincialism is so old and out of date, the wonder is that such a smart writer as "Cosmos" should be content with such repartee.

When you hear a cat on the roof at night and wish to dislodge him, small matters of etiquette are apt to be overlooked. Your readers, as well as "Cosmos," must therefore pardon me for not stating amount of my contribution towards the proposed holiday for "Cosmos" during the Salon; but, as I notice my fear concerning "Cosmos" is being verified—for in the last issue of JOURNAL he refers to the Salon as a dustbin—I shall be happy to hand "Cosmos" half a guinea if he will promise not to visit the Salon, nor refer to it, directly or by inference, in any of the pages of JOURNAL.—I am, yours, &c.,

PAUL COE, *High Art Photographer.*

The Rembrandt Studio, 39, Eastgate-street, Gloucester, September 27, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Edward McGowan, High-street, Omagh.—*Two photographs of their Royal Highnesses the Duke and Duchess of York, taken at Baronscourt, September 2, 1897.*

RECEIVED.—T. BELL; GRATEFUL; T. HARDS; and others. In our next.

AJAX.—Yes; just as efficacious.

THOS. CLARKE.—Thanks, but we do not keep the addresses of correspondents.

A CONSTANT READER.—The 00000 Bray answers your requirements, we think. We have not known it to smoke.

E. GALBRAITH.—The spots appear to have been caused by the presence of iron either in the hypo or in the washing vessel.

PRINTER.—The negatives appear to be over-exposed. Try the effect of reducing the exposure. On the data given, this seems to us the explanation of your failure.

THE AMERICAN PHOTO-ENGRAVING COMPANY (Colchester), and others who write regarding Messrs. Letts' photography-for-nothing scheme, are thanked for their communications.

CRYSTOLEUMS.—PAINT. This has so often been given in back volumes and in the ALMANACS that we cannot spare the necessary space in this column to give such details as would be of any practical use to a novice.

TONING COLLODIO-CHLORIDE PRINTS.—JOHN ELLIOTT. We know of no well-tried formula for toning with the material named. Perhaps, if you write to the makers of the paper, they may be able to help you.

POISONS ACT.—S. W. The dealer is quite right. If he is not a pharmaceutical chemist, it would be illegal for him to supply you with cyanide of potassium unless in wholesale quantities. Such is the absurd Poisons Act.

DEVELOPING TRAY.—DABBLER writes: "I have a large wooden dish which I have pitched all over inside and out. Shall be glad if you will tell me how and what to paint it with. I want to use it for developing bromides."—If the vessel is thoroughly coated with pitch, it does not require painting.

INTENSIFICATION.—H. H. R. Rewhiten the negative with bichloride of mercury and blacken by one or other of the various methods. You ought to have obtained the necessary density by the method you tried, unless the image was too thin in the first instance to be capable of being sufficiently intensified to make a good printing negative.

CRYSTALS ON LANTERN SLIDES.—J. WILSON asks: "Can you kindly indicate the cause of the small particles on the surface of the two slides sent herewith? They do not make their appearance till the pictures have been passed through the lantern. It is only one or two now and then that have the defect."—The crystals are hyposulphite of soda which has been left in the film through imperfect washing.

B. J. BECKTON.—1. We shall probably shortly publish such a list either in the ALMANAC or the JOURNAL. 2. Not that we are aware of.

THE CITY AND GUILDS EXAMINATION.—STUDENT says: "Would you give me names of the best text-books I could get for working up to pass the Ordinary Grade in the City and Guilds Examination in photography?"—Our correspondent had better procure, of Messrs. Whittaker & Co., Paternoster-square, the programme of next May's technological examination, in which a list of text-books is given.

WESTERN AUSTRALIA.—OPERATOR writes: "Can you give me any idea of the prospects of a first-class operator, well educated and of good appearance, in Western Australia? Things are so bad here that I am inclined to try one of the colonies, and thought this one might be the best?"—We are quite unable to give any opinion ourselves. Perhaps some reader, however, who is acquainted with the colony, will advise.

EYESIGHT.—H. H. H. We cannot undertake to recommend any spectacles that will help you. From what you say, however, we imagine you are suffering from astigmatism, and that may account for your difficulty in retouching. Suitable spectacles will help you very much, and we should advise you to consult an oculist on the subject. You can get advice gratis at any of the ophthalmic hospitals if your means will not allow of your paying a specialist's fee.

STAINED AND SPOTTY PRINTS.—VERY ANXIOUS asks: "Could you inform me of the reason of enclosed prints colouring like they are? No. 1 was printed twelve months ago, and No. 2 only five months. I, being the printer and toner, am getting into serious trouble about it. Hoping you can inform me."—Clearly something in the manipulation; but, without seeing it carried out, we cannot tell where in No. 2. The stains in No. 1 are due to imperfect fixation.

SCRATCHED BURNISHER.—T. SELWYN. The marks on the prints sent are due to the bar of the burnisher being scratched, and there is no way of getting rid of them except by grinding them out. If you do the work yourself, the best way will be to take a perfectly flat sharpening stone, or hone, and then work the bar longitudinally backward and forward along it with oil till the scratches are ground out. If the bar is of hard steel and the scratches are deep, patience will be necessary.

STAINED NEGATIVE.—E. EVERITT writes: "Unfortunately I have a negative badly stained through getting wet while printing. I have the negative in hypo for upwards of a week, which has partly removed the stains. If you could send me a formula to remove them wholesale, I should esteem it a great favour, it being a valuable negative."—Try a weak solution of cyanide of potassium, or you might try King's solution for the removal of stains. It may be had from Messrs. Marion & Co.

RED LIGHT.—W. BLOCK complains that, after he has been developing by the ruby lamp for a couple of hours or so, his eyes become very painful and he gets a bad headache which lasts for hours. This is not an uncommon thing. Some cannot stand a deep red light for long at a time. We would suggest that our correspondent try deep orange glass in place of the ruby, some of which is quite safe if the plates are not exposed too long to it in the early stage of development. This glass, however is not safe with orthochromatised plates.

SPOTS ON PRINT.—PUZZLED writes: "I would feel greatly obliged if you could let me know what might account for spots same as on photograph enclosed. I have been greatly troubled with them lately, and cannot get at the cause. They do not appear for a week or so after photograph is mounted, and then gradually come out all over. I have used this paper for years, and have never been troubled before. Would an impure hypo do it?"—It is impossible to say what is the actual cause of the spots, as they and similar ones arise from different causes. Impure hyposulphite of soda, particles of pernicious matter, in the form of dust, settling on the prints while moist, a bad mountant, or the mounts themselves, may be the cause. All these circumstances will cause spots so very like those on the print enclosed that one cannot offer a definite opinion as to which really has produced them.

BACKGROUNDS; COLOURING.—CONSTANT READER (Watford) writes: "As a constant reader of your valuable JOURNAL, I take the liberty of asking a few questions. 1. Can you tell me what is the best substitute for canvas for a background, that is cheaper and has as smooth surface? and what would you recommend me to colour or cloud it with? or could you tell me of a book that treats background-making? 2. Can you also recommend a book that fully explains colouring and tinting of photographs? 3. Also a book on the working up of enlargements in black and white, &c.?"—In reply: 1. Brown paper, which may be had of any length, and about five or more feet wide. Ordinary distemper colour will be best for the paper. There is no book on background-making. 2. Messrs. Newman & Co., 2, Soho-square, publish a work on photographic colouring. 3. Newman's book will give much information that may be utilised in working up enlargements.

STOPS.—BARRY. The meaning of the numbers on the stops is simply this: *f*-8, *f*-11, *f*-16, and so on, denote that the diameters of the respective apertures are an eighth, an eleventh, or a sixteenth of the focal length of the lens. In your studio work we do not think you could do better. Roughly speaking, the smaller the stop you use, the longer the exposure and the crisper the definition. Thus, if with *f*-8 you give one second, with *f*-11 you would require to give two seconds, *f*-11 being, so to speak, only half the size of *f*-8, and therefore only passing half the light. We trust we have made the matter clear to you. A careful study of the late J. Traill Taylor's book on *The Optics of Photographic Lenses* would be useful to you. As regards your failure to obtain a sharp image out of doors, possibly the plane of the sensitive plate is not in register with the focussing screen. Examine the camera and see if this is so. If it is not, then the lens may not work to focus. Communicate again if this information is not sufficient.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1953 Vol. XLIV.—OCTOBER 8, 1897.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

THE thirty-seventh issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. It is in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the ALMANAC. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us lists of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the ALMANAC is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

THE "Forewords" to the catalogue of the Photographic Salon are, as usual, entertaining reading. They have the "note" of defiance that characterises the aggressive in latter-day art and literature, and they are clever to excess. People, however, are beginning to see through the trick of attracting notoriety and attention by attacking and deriding the conventional, so that, when the Forewords tell us that the objects of the promoters of the Salon were avowedly revolutionary, that they met, "as might have been expected," with strong opposition, but that they confidently believe they have succeeded in living down that opposition, we simply perceive in all this an imitation of the Decadent method of propaganda applied to photography. It is, in fact, the "usual thing" of end of-the-centuryism, as it has manifested itself in so many branches of art—the anxiety to be unconventional to the verge of absurdity.

* * *

THERE is a certain amount of crude honesty in the declaration that "the aims which were set before the public as the mission which the organizers of the Salon sought to accomplish were, amongst others, to show that, released from mechanical trammels, photography is capable of dealing with the subtleties of pictorial effect; that it may aim at a high expression of decorative value; that it may be suggestive rather than purely imitative; that it is not to be bound down by any rule of accuracy of definition; that the capability of producing a documentary fact does not preclude the power of exercising fancy and imagination; and that an indissoluble connexion with the abstruse mysteries of chemistry, optics, and mathematics is, for pictorial work, very slight indeed." But the "mechanical trammels" of photography are bound to remain, nevertheless. This is a plea for the freedom of half an artistic individuality

the other half being made up of spectacle lens, camera, sensitive plate, focussing screen, dark slide, and printing process. Perhaps this reminder, that after all photography really must have very considerable mechanical uses for those to whom the above declaration of aims applies, may lead them to reflect that, if they are anxious to make an assertion of a whole and unassisted artistic individuality, some other branch of graphic art, and not photography, must be sought.

* * *

With "the assumption that photographers should themselves be capable of fixing the standard of merit of their own pictorial work without appealing for assistance to experts in other arts" we in the main agree, and the sooner the practice of inviting painters and etchers, as such, to judge at the exhibitions of photographic societies is abandoned, the sooner will the time arrive when photography will earn the public respect that is undoubtedly its due. By the way, the Forewords tell us that "the colour and character of the wall upon which the picture hangs are quite as important factors in its framing as the mount or moulding which immediately surrounds it, and that a monotonous regularity in the arrangement of an exhibition is in no way a necessity." Quite so; but this is not an original discovery.

* * *

The annual meeting of the Photographic Copyright Union was held last week, and a report of it appears in another part of the Journal. The meeting was characterised by a considerable variety of incidents of an amusing nature. The expression of a feeling in more than one quarter that the Union should widen the scope of its usefulness so that other matters besides the protection of copyright should engage its attention, and the amendment of Rule XXIII. making the charge for the use of copyright photographs dependent upon the scale of reproduction were the two principal items of business accomplished by the meeting.

* * *

Messrs. S. B. Bolas & Co., of 11, Ludgate-hill, E.C., write: "With reference to the medal that was awarded this firm for architectural work at the Royal Photographic Society, we have the pleasure to inform you that the negative was made by Mr. Richard Landor Warham, who is a partner in this firm. Mr. Warham was an old friend of the late Richard Keene."

* * *

Messrs. W. Watson & Sons, of 313, High Holborn, W.C., write: "With reference to your notice of our portable studio stand, which we exhibited at the meeting of the Photographic Club, appearing in your last week's issue, we should like to be allowed to say in your columns that the total weight of the same is thirteen pounds. The weight was mentioned by our assistant who showed it, and your report, that it was considered heavy to carry about, without stating the weight, is apt to mislead. We think photographers generally will agree that a studio stand weighing thirteen pounds is not heavy." Thirteen pounds can certainly not be considered heavy for a studio stand.

* * *

The prospectus of the Winter Evening Classes in Photography and Photo-engraving, to be held at the Polytechnic Institution, Regent-street, during the session 1897–98, has just been issued. The date of the opening night is October 19, when a social reunion will be held in the large hall of the Polytechnic, Mr. Frederic E. Ives taking the chair at eight o'clock. An attractive and interesting scientific programme has been arranged, and admission is free to photographers, engravers, and lithographers, and those interested in these trades.

* * *

Those of our readers who are interested in the study of photography, or are desirous of attaching themselves to a course of instruction, can obtain the prospectus of the Secretary of the Institution. The course of study arranged for the winter is a most comprehensive one. Photogravure, process engraving, photo-lithography, collotype, wet collodion; silver, carbon, platinum, and bromide printing and enlarging; retouching and finishing enlargements in black and white are among the subjects taught, and in which practical instruction may be obtained. The class fees are extremely moderate, and among the names of the teaching staff are those of Mr. Howard Farmer (the Principal), Mr. Horsley Hinton, Mr. Francis T. Beeson, Mr. J. H. Gear, Mr. Ernest Wesson, Mr. W. Arndt, Mr. A. A. K. Tallent, and Mr. George Ho'zhau-er, all men of experience and ability in their respective branches of work. We cordially recommend the Polytechnic School of Photography to those anxious to acquire or perfect a knowledge of any branch of practical or theoretical photography.

RETINAL AND CAMERA PICTURES.

We recently discussed, rather from a physiological than a physical standpoint, the relationship of the eye to the work of the camera, and we now propose to extend our purview more in a direction capable of physical measurement. In a certain sense the subject may be said to have been well thrashed out before, but it is yet capable of being distinctively treated as regards the parallelism between the "work of the camera" and the correct draughtsmanship of the artist painter. The latter speaks of two kinds of perspective, aërial and linear. Aërial perspective is just where the average photograph is untrue to nature; it exaggerates either to caricature or to degradation one feature of a picture that, in our own country of all others is so great a charm—the effect of atmosphere of various degrees of transparency and of various distances, that softens hard outlines, irradiates a picture with light and glow, harmonises colours, and, by its various depths, according to the distance of objects, subtily suggests light and air and form. In a photograph atmosphere, unless exceedingly clear, usually means, for objects removed from close proximity, so great degradation and so complete a muddying of shadows, that even if made to appear pretty by a dexterous hand, the photograph is yet by no means a correct representation of the object depicted.

In this sense the opinion so often delivered that a photograph exaggerates, and is untrue, may be considered literally correct; but, in fact, this depreciatory kind of remark is not usually applied to aërial perspective, it is intended to refer to the geometrical aspect of the question, and it is that to which we would draw attention.

Linear perspective has been described as being the art which enables us, by fixed rules, to represent truly on a plane surface that which appears to the sight in every variety of form and distance, and this is done by imaginary lines traversing such plane, and arranging the shape and position of every object with regard to the point of sight determined upon. It is an a-

based upon a knowledge of mathematical and optical principles, "which teaches us to delineate solid objects on a plane surface, as they appear to the eye from the particular point from which they happen to be viewed." The first preliminary in such geometrical means of depicting objects is to assume the existence of a piece of glass placed in front of the draughtsman, who for the time being is supposed not to move, and to be possessed, for the nonce, at any rate, of one eye only. With the head held rigid and a pencil in hand, the student traces on the glass lines that appear to cover the boundary lines of the objects on the other side of the glass. A linear picture is thus obtained, and from such picture are deduced a set of rules by which, when the distance, for example, of a particular object of regular geometrical form from the floor and from the sheet of glass itself, are given, with also the particular angle at which its side or sides are placed to the sheet of glass, a geometrical drawing may be made which shall coincide to the minutest degree with a drawing upon the glass made as first described. Let it be remembered that the postulates are that glass sheet and observer's eye are in a fixed position, though we may parenthetically remark that, if the glass sheet be brought nearer to the eye to the extent of half its distance, and the picture first obtained were reduced to a scale of one-half, or to a quarter distance, and a scale of one-fourth, and so on, the coincident lines in picture and object would remain the same. It is not, of course, our purpose to give a treatise on linear perspective, but our readers may take it from us that we have, with perfect fairness, formulated their object and stated their possibilities.

If now we compare a photograph of any object whatever, in any situation whatever, with a "perspective drawing" of the same object, it will be found, provided that the camera were placed upright, and that its lens (of "rectilinear" construction) were directed "square" to the object, there would be no difference between the two delineations, and that, for instance, if the drawing were done on tracing paper, and on the same scale as the photograph, every line, point, and angle of the one would coincide with similar parts of the other, "each to each," as Euclid puts it.

From all this it is evident that, subject to the given restrictions of distance from the eye, a photograph and a perspective drawing are absolutely identical delineations of the outlines of the objects they represent.

Why, then, the current charge of want of proportion, exaggeration, &c.? The reasons are twofold. In the first case, an art student, when he is set to practise the above-named rules, is at the outset informed that it is not advisable to apply them to any portion of a view outside an angle of 60°. It is to photographs embracing larger fields of view that the depreciatory criticism is most frequently applied.

In the second place, the student is taught that the pencil picture obtained by the rules will only coincide with nature for one particular distance of our glass sheet. Similarly the lines of a photograph will only coincide when it is held at one especial distance from the eye. Finally, an artist of the brush always keeps well within his 60°, under which conditions the proportions, deviations, and "foreshortening" of his lines being less pronounced, do not force themselves upon the judgment; but, on the other hand, a photograph often embraces a far wider field of view than 60°, with the natural consequence that, except when seen at one particular distance (which rarely happens to be the case), the foreshortenings and proportions of the outer parts of the photograph, though in complete accordance with the rules and canons of linear perspective, irritate the eye. Finally, these irritating portions of the view are all contained in that particular area—the portion outside an angle of 60°—which the draughtsman student, as we stated, is at the outset of his studies instructed to strictly taboo. That is the whole matter in a nutshell—photographic veracity *versus* artistic expediency.

The Lantern.—The lantern season at the different photographic societies, judging by the reports, seems to have commenced earlier this year than usual. But for the lantern, there is no question that many of the societies would find it very difficult to provide pabulum for their meetings. But is there not a tendency just now to overdo it at many societies? Indeed, some appear to be more lantern societies than photographic ones. This may probably be accounted for by the extended use of hand cameras in place of the larger stand ones, also by the fact that oxygen can now be obtained in such a convenient form. The case would probably be different if the gas had to be made by the user, as of old. However, it may be worth the consideration of some of the societies as to whether they are not relying too much on lantern entertainments to the neglect of the other and perhaps the more important phases of photography. The lantern and lantern matters and entertainments, if too frequent, are apt to pall on one.

Art at the East-end.—Reference has from time to time been made to the loan exhibitions of works of art that are periodically held at the East-end of London, and how well they are appreciated by the denizens of that neighbourhood. They are now to have a permanent picture gallery, which is to be erected in the High-street, Whitechapel, adjoining the Public Library. The site has been conveyed in trust to the Rev. Canon Barnett and others. To this reverend gentleman must be credited the getting together of most of the loan exhibitions that have previously been held in the neighbourhood of Whitechapel. In the new building, when erected, it is proposed to hold two loan exhibitions annually, as well as other exhibitions. The majority of the photographers at the East-end do not seem to have profited greatly by the art exhibitions held there, that is, if one may judge by the portraits shown in their shop windows and show-cases, for, as a rule, there is little art displayed in them. That is a little surprising, seeing that the greater portion of the East-end public do appreciate art, as witness the interest they take when good pictures are on view, and they would, doubtless, esteem a little of it in their portraits if they could get it.

Artists and Medals.—Last week we alluded to the question of medals at Photographic Exhibitions, and their abandonment, the chief argument quoted in its favour being that, as in the case of the Royal Academy and other picture Exhibitions, the acceptance and hanging of the works is a sufficient recognition of their merits. We also alluded to the fact that, notwithstanding this, English R.A.'s did compete for medals at foreign Exhibitions where they were given, and were successful in carrying off a fair share of them; and here is another proof of this, the Superior Jury of the Brussels International Exhibition has confirmed the following awards to British artists: Médaille d'Honneur to Mr. Alma Tadema, R.A.; first-class medals, for painting, to Frank Dicksee, R.A.; E. J. Gregory, A.R.A.; Seymour Lucas, A.R.A.; J. W. Waterhouse, R.A.; J. C. Hook, R.A.; J. S. Sargeant, R.A.; H. Herkomer, and Sir J. D. Linton; for sculpture, Mr. E. Onslow Ford, R.A., takes a similar medal.

Amongst the second-class medal-winners, including other well known English artists, are three R.A.'s, five A.R.A.'s, as well as members of other art societies. This quite dispels the idea that painters are against medals, and are content with the honour of their paintings being accepted and hung, as so often alleged by those who now advocate their abandonment at photographic Exhibitions, and who at one time were amongst the greatest medal-seekers

Picture Galleries on Sundays.—The National Gallery, the Tate Gallery, and the National Portrait Gallery will be closed on Sundays until next spring. It seems a great pity that it should be so, for there is little doubt but they would be well patronised during the winter months, possibly more so than in the summer, when those pent up during the week prefer a visit to the country. The returns of the numbers of visitors show how well the Sunday opening of the galleries is appreciated. On the last Sunday they were open some 1500 people visited the National Gallery, and nearly half that number the National Portrait Gallery. Although the Galleries in Trafalgar-square and the Tate Gallery will be closed, the Picture Gallery at South Kensington, as well as the Museums generally, will still be open on Sundays from two to five o'clock p.m. But South Kensington is not so come-atable from all parts as Trafalgar-square.

By the way, would not the opening of the Royal Photographic Society's Exhibition for one Sunday be a great convenience to many photographic *employés*, whose only chance of seeing the pictures is in the evening, when, through the bad lighting of the room, they cannot be seen to advantage? Possibly, however, there may be something in the agreement with the Water Colour Society that may prevent it.

Novelties (?).—An evening paper, that often "enlightens" its readers on the latest matters scientific, one day last week announced that a discovery has lately been made of a submarine camera by which the bottom of the sea can be distinctly photographed. It says that attempts have been made to do this before, but this is the first successful result, and is the invention of an officer in the Brazilian navy, who has already with it obtained some "magnificent pictures of the great depths below." An electric lamp, it is mentioned, supplies the light. It is also stated that "the camera is watertight," but might not that have been assumed even by the most verdant of the lay readers?

A few days later the same paper annonnced another new invention in the following words: "A new instrument, called the projecting microscope, has been shown for the first time in Baltimore. By its use the images of stings of mosquitoes, beetles' eggs, and other extremely small objects were thrown upon a screen by the electric light, and were distinctly visible to thousands of students." It further adds that "it is thought that science will be greatly benefited by the instrument." This is seriously given as a new invention. A few silly seasons hence our evening contemporary may possibly enlighten its readers by the startling announcement that Queen Anne is dead.

BY THE WAY.

The topic of the hour in purely photographic circles is, I suppose, the Photographic Exhibition—I mean, *the* Exhibition in Pall Mall, for, at the time I write, the Salon has not yet opened its doors to outsiders. Besides, as yet, very few beyond the magic circle of those immediately interested in "running the show," and perhaps a few provincial "high-art" photographers (whatever that term may mean translated into every-day English), take the Salon seriously. No doubt, in time, when it has dropped, or at least modified, some of its eccentricities, its full meed of recognition will come, but till then the Royal Photographic Society will remain, as it ought to, the representative show of the year.

Not being an exhibitor, I am not competent, I am sorry to say, to criticise the work of the Judges; but, so far as I can gather from others, interested and not, there is very little fault found, despite the fact that it was an almost entirely "painters'" jury. It is by no means a novel experiment in Pall Mall to have the painter-artist represented on the jury, but it is decidedly stretching the principle a good deal further than has ever been done before to have the composition of even the "art-section" jury three parts painter to one of photographer. In former years, when Mr. Stacey Mark and Mr. Henry Moore and others have acted as Judges, they hav formed the minority section, having been generally outnumbered b five or six to one by photographers with more or less right to hav the descriptive term "art" attached.

That everything has gone satisfactorily is, no doubt, in grea measure due to the remarkable change that has taken place in th character of the Exhibition itself. How great that change ha been in the last, say, twenty years is difficult to describe to tho who do not personally recollect the annual "shows" of that perio Take one year, for instance—it is not much, if any, further back tha the period I mention—when the attraction (?) of the Exhibition wa the collection of life-size portraits, taken direct, that were entered i competition for the Crawshay Prize. Merciful Heavens! the ver recollection of that collection of monstrosities is enough to mak even a "high-art" photographer of to-day shudder. That there wa room for improvement in the direction of life-size portraiture at tha day goes without saying, and it was with the view of stimulating tha improvement that the late Mr. Robert Crawshay offered a substan tial prize for the best life-size direct portrait. Why *direct* it is im possible to say, unless for the purpose of confining the competitio within the narrow limits of those who could afford a lens suitabl for that class of portrait. Any how the result was sufficient to—and I think, did—"stall off" every one from further efforts in tha particular direction.

At that time the great bulk of the exhibits was composed of th better class of portraits to be seen in the show-cases in the prin cipal streets of London and other leading cities, together with good deal of landscape, amateur and professional, that can be bes described under the expressive title of "the usual thing," and emana ing year after year from pretty nearly the same sources. Th different professional landscapists trotted out samples of their sea son's work, and the leading amateurs did the same, and the meda were pretty fairly distributed between them. London amateurs, a might be expected, were usually well represented, with the unfo tunate result that, as the members of that august body the Amateu Field Club seemed then, with very few exceptions, to invariabl hunt in a flock, and to be incapable of striking out a solitary an individual line; visitors to the Exhibition were treated to a series o mementoes of the Club's outings, consisting of the same hackney views under different methods of treatment.

To a certain extent this was instructive, but chiefly in the directio of what to avoid. Of course, amongst the general exhibitors, the were to be found workers who showed the same idiosyncrasies, bu in the case of a number of collections of the same views, the differe styles of treatment were placed in direct comparison, with the resu that the faults of each style were intensified, and the better qualitie sunk or left in doubt. Thus one well-known wet-plate worke whose *penchant* was for softness and detail, and whose system la rather in the direction of over-exposure, found a foil in a fellow member whose taste was rather for boldness of effect, which, bein a dry-plate man, he easily obtained by curtailing his exposure Then, another was remarkable for the technical perfection of h work in every point. The focussing was sharp in every part of th picture, the exposure timed to a nicety, giving at once delica detail in the high lights, rich transparent shadows, and gradatio everywhere, and, lastly, the brilliancy and tone of the prints wer matters of envy; but you looked at them without any feeling but on of admiration for the *technique*, without any sense that they wer anything more than good copies from nature in her most ordinar moods. Then, again, there was the gentleman whose *ultimatu* was a "pretty" negative, and who persistently forgot that *afte* the negative came the print, which was really what ought to b studied; while, for the last, there were a lot of members who di their best without any definite system, and were not afraid to sho the results.

We see very little of this sort of thing nowadays. Whether it i that the weeding-out system adopted of late years is to be credite with the result, or that the exhibitors themselves are wise enoug to recognise that their ancient methods don't work in with moder

ideas, I am unable to say, but we don't get nowadays the annual object-lesson that we did until very few years ago. Perhaps it is that gelatine plates will not work to the old methods.

In the old days, in addition to the mass of ordinary (in a double sense) portrait and landscape work, the upper end of the room opposite the refreshment table was wont to be occupied by the most "notable" works of the year, notable, in too many cases, for nothing more than size. I have in my collection of curiosities several photographs of the interior of the Exhibition room in long bygone years, and that top end is generally filled up with immense productions, whose solitary reason for being there was that they were shown for trade purposes. *Apropos* of one of these, I remember a friend who was an artist—I mean a painter—remarking to me, "Ah, yes, undoubtedly photography is an art, but it's the art of advertising."

Then came a time when the change began to spread over the walls. Was it not in 1877 that Mr. Charles Bennett's gaslight picture surprised everybody? I think it was. Next year showed the first "serious" turn in the direction of professional portraiture on gelatine plates; then came a long series of years when instantaneous work seemed to be everybody's hobby, and the chief difficulty seemed to be to find novel subjects. But this was when we were learning to use our new tools; gelatine was such a surprise that photographers may be excused for, for a while, going, as it were, mad over its rapidity; but, when they had learnt to work the plates properly, and the plates themselves became reliable, they got tired of what I once heard described as "monkey tricks." Express trains at full speed lost their special attraction, and we gradually settled down to the real work of making the most of our new facilities.

In arguing the respective merits of the old and new styles of photography, we are apt to overlook the fact that the advent of gelatine established an entirely new order of things; it not only rendered possible—nay, easy—a very wide class of subjects that were previously utterly beyond the most skilful photographer's power, but it placed them within the reach of all. It rendered it possible for a man to take the most perfect photographs without being a photographer at all. The exhibiting amateur of twenty years ago had to combine the functions of chemist and artist; the successful exhibitor of to-day may sink the chemist altogether, and often does, but there is no reason for him to sneer at his predecessor because he *had* to give attention to the dirty work or drudgery. How would some of our modern specialists in fuzziness, mud-banks, or tree-trunks, get on if they had to perform the matter-of-fact as well as the sentimental part of the business? As a matter of fact, the face of artistic photography is altogether changed, because scientific photography has become so much easier.

It is not a long distance from Pall Mall to the Aquarium, to another show that is remotely photographic. I allude to the animated photographs of the Corbett-Fitzsimmons fight. Now, I never saw a real prize fight in my life; the nearest approach to it was some ten or eleven years ago. When out one day with the camera in the neighbourhood of Colnbrook and Uxbridge, I got suddenly and unexpectedly mixed up with about the rowdiest and most disreputable lot of beings I ever saw. I learnt afterwards, for the air at the time was full of inexplicable mystery, that it was the redoubtable pugilist, Jem Smith, and a party of friends, vainly endeavouring to bring off a fight, but the police on both sides of the county boundary were too much for them. So, I repeat, I never saw a fight; but I am old enough to remember the famous fight between Sayers and Heenan, and the almost breathless interest with which I sat and heard every detail of the fight as reported in the *Times*, read by one of my schoolmasters on the following day. I can remember even now the picture I formed in my own mind of what a grand sight it must have been, and, from what I have subsequently read in *Bell's Life* and elsewhere, I have always longed to see a *real* fight. But no more cinematographs! I am quite ready to agree with the statement that there is nothing in the Aquarium show "to shock a Sunday-school teacher." Yet, after all, it is very wonderful.

DOGBERRY.

THE PHOTOGRAPHIC SALON.

WHATEVER danger there was of the fifth Exhibition of the Photographic Salon suffering from the defects of those qualities which characterised its four predecessors, and failing any longer to excite either the surprise or the ridicule of photographers, has been adroitly averted by Mr. Maskell, the "one man" of the show. With the consummate skill of an accomplished *entrepreneur*, he always appears to keep a reserve of attractions up his sleeve, and to draw upon it at the moment when there is the least indication of a flagging interest on the part of the people for whom he caters. This year he stages Mr. George Walton, an art designer and decorator, and the bichromated gum process. These, so to speak, are the star turns of an entertainment that may or may not satisfy the shilling public, but which is bound to lead to a great amount of discussion among photographers.

Mr. Walton, "specially engaged," of course, was apparently given *carte blanche*. He has converted the somewhat sombre Dudley Gallery into an apartment of sweetness and light by covering the walls with brown canvas, upon which he has cast many a quaint and curious design in, presumably, coloured chalks. Round three walls of the Gallery runs a shelf in whitened wood, and above this to the roof is a covering of what appears to be brown-holland sheeting. The entrance end of the Gallery is hung with gracefully draped material of a somewhat paler colour, the effect being slightly theatrical. The two hundred and thirty odd photographs are hung with plenty of intervening space between them, and are all practically on the line. Mr. Walton, who was intrusted with the hanging, has grouped the photographs to the best advantage, and, jaded Exhibition-goers as we are, we certainly experienced less fatigue in examining the well-spaced-out frames on the light brown background than we have known at any previous Exhibition. We do not pretend to be able to follow Mr. Walton in the philosophy of his scheme of decoration, but the total effect of the Gallery struck us as refined and reposeful. The colours of the frames are chiefly dark brown, green, and black, and there is every possible colour among the photographs, so that monotony in this respect has most decidedly been avoided.

Much as we respect Mr. Walton's decorative efforts, and however daring and striking some of the specimens of the frame-maker's art on view at the Dudley Gallery may be, the photographs, after all, are "the thing," and the one feature by which the Exhibition must be judged. The canvas hangings, the whitened shelving, and the flower-pots will presently be stowed away in the lumber-room for twelve months, and the picture frames can always be duplicated at so much a foot in the ordinary run of business. Photography is not to be taken in and done for by the upholsterer and the cabinet-maker, and weighed and estimated according to the excellence of the productions of those useful tradespeople, any more than are the works of dramatists and actors to be considered with reference to the creations of the scenic artist and the costumier. The photographs, or the play and the acting, as the case may be, remain to be judged for and by themselves—the ornamental accessories are swept aside as more or less necessary, but temporary, accidentals.

The dominant "note," if we may use the current jargon to convey our meaning, of the Salon Exhibition, is the bichromated-gum process About one-third of the photographs shown are produced through this medium. It is the chosen process of most of the foreign exhibitors, and some English photographers also appear to have succumbed to Mr. Maskell's strenuous advocacy of this method of photographic printing. The force of imitation can no further go. Bichromated gum lends itself to the production of photographs having the effect of stippling on a rough-grained surface. Any colour of pigment can be used, and there are also examples here in two or three colours. Both comparative delicacy and excessive breadth of structure of image appear to be obtainable, and thus it falls that, among the contributions in bichromated gum to the Salon Exhibition, you get a variety of effects in coarseness of deposit such as is not obtainable by any other process.

One result of this epidemic of bichromated gum is as strange as it must have been unforeseen. It comes to this: that the finished photographic work of such masters as William Crooke, Craig Annan, Horsley Hinton, H. P. Robinson, Ralph Robinson, Joseph Gale, and others is obscured in interest by the imitation brush and stippie work of Demachy, Watzek, Henneberg, Kuhn, Puyo, Bremard, Charles Moss, John Mummery, and several others. The first-named photographers—such is the irony of events—appear to have sunk to the level of producers of the "usual thing." What business have they in this Gallery? Do they relish the feeling that their frames have simply been hung as so much padding? Their photographs are altogether out of place here—

they should be hanging at No. 5A Pall Mall East, where it is yet unnecessary that you should have gone to the Italian warehouseman for the material wherewith to make your pictures. On the other hand, we suppose that such powerful supporters of the Salon as the Messrs. Robinson, Mr. Crooke, Mr. Hinton, and the other gentlemen named had to be temporarily conciliated, and so their photographs have been admitted on sufferance. On no other theory can we account for their presence on Mr. Walton's canvas.

The place of honour at the end wall of the Gallery is occupied by Mr. Robert Demachy with a series of bichromated gum pictures. In this process Mr. Demachy is an adept, and, as he obviously brings high artistic skill to bear in his work, his results are probably the most successful, as they are undoubtedly the most convincing, in the room. His colours are well chosen, and in his portraits and decorative studies there is all the charm which your true artist can exhibit on any medium that he may select for photographic purposes. Demachy's *Idea for a Poster* is the most daring of his contributions. It depicts the seated figure of a girl in a *café*. She herself is shown like unto a silhouette, while her surroundings are in bright light. Mr. Cadby also has a similarly conceived *Design for a Photographic Poster* (No. 169). Here a lady is holding up a printing frame for examination. Her face is shown in profile, her back is to the spectator, but the nearly straight outlines of the figure are by no means graceful. This last, however, apparently fulfils one of the requirements of poster work, which is usually ugly and silly in about equal proportions.

Mr. Craig Annan this year takes a stride backwards. His photograph of *A Painter's Page* (No. 106), invested with the insignia of his office, is good of its kind, but leaves us in doubt as to why it was sent in. No. 125, *In a Garden Fair*, is apparently an enlargement of a photograph taken through an open door, and revealing a lady with a sun-bonnet meditatively walking in a garden, an old-fashioned house forming the background. It is very good photography—the gradual transition from dark shadow to brilliant light is well sustained, and you certainly realise the sensation of looking out upon a sunlit garden; but, as a pictorial subject, it seems hardly to have repaid the labour devoted to it. Mr. Annan's other contribution is a portrait of a laughing little girl, *Molly* (No. 162). The head is shown very diffused in treatment, and the frame of the photograph is a wonderful affair in hammered aluminium.

Mr. Crooke wipes out all his previous triumphs by the beauty and nobility of his portraits. Than No. 24, the portrait of a lady, we have seldom seen a finer example of dignity of pose. The picture is that of a handsome, aristocratic-looking sitter, to whom we feel every justice has been done by the artist. *The Favourite* (No. 54) is the charming study of a lady with a cat. So happily and so easily has the grouping been effected that one is totally unconscious of looking at a photograph in this admirable picture. Prominent among Mr. Crooke's other exhibits is a large study of *A Crusader*. There is no doubt that Mr. Crooke, who is a perfect master of technique, produces by far the most artistically satisfying portraiture of any photographer in the kingdom.

Mr. Horsley Hinton breaks, to some extent, new ground in *Homeward Loiterings* (No. 7), a flock of sheep dispersed along a small rivulet, a bright and vigorous bit of work, and in *Melton Meadows* (No. 71), in which, out of such simple materials as a placid river stealing by banks fringed with lofty trees, he contrives to create an effect full of the languorous charm of summer-time. Mr. Walton's background, however, badly depresses Mr. Hinton's photograph. After an absence of two years from the Salon, we find the name of Louie Rolfe attached to two large studies, *Gloaming* (No. 197) and *Ebb Tide* (No. 207), which might easily be mistaken for Mr. Hinton's work.

Mr. Davison appears to have adopted the style of his own pupil, Mr. Calland. His two street views, *Market-place, Aix-les-Bains* (No. 112), and *Cockspur-street* (No. 132), recall the method of treatment of *Brompton Road* and *The Mall*. *The Herring Market* is more characteristic of the later manner to which Mr. Davison accustomed us last year. Mr. Watzek is among those who have gone in for bichromated gum. His *Morning* (No. 9) is apparently an effect obtained by the admixture of blue and green pigments. It is interesting as an experiment, and nothing more. On the other hand, in No. 139, *Kibitz*, Mr. Watzek shows us a bit of work which scarcely falls short of being a masterpiece. He depicts two men, with their pipes, seated at a game of cards. The life-like attitudes, the naturalness of the grouping, and the contrasts of the lighting, combine to secure an absolute success. There is so much dramatic force and reality in this picture as to make one inclined to be sceptical of such a result having been obtained by photographic means. But there it is, and the pigment process suits the subject admirably.

Mr. Heinrich Kuhn is also one of those who have largely patronised bichromated gum. *Still Life* (No. 13) is a very realistic three-colour study of fruit on canvas, and it is certainly cleverly done; but of his highly coloured *Orchard* (No. 21) we are somewhat doubtful. It is the kind of colour effect one meets without surprise in the same room when the New English Art Club rules the roost. Mr. Kuhn apparently likes to puzzle us. Here, for example, is his *Southern Landscape* (No. 49), which, to the eyes of those who can see the true inwardness of these things, may be a gem; to us it simply appears as an abominable blot in Reckitt's blue on a rough surface. We apply the same remark to Mr. Kuhn's *Fishing Boats* (No. 75) and *Venice* (No. 200), two other productions in patchy blue pigment. On the other hand, Mr. Kuhn, with *A Head* (No. 142), shows us so finely how he can pose and model the human head that we wish he would leave off imitating blue-chalk work on a rough surface by means of photography. Dr. Henneberg has mastered bichromated gum in three colours to some purpose, as in *After Sunset* (No. 201) the colours are vivid and natural and the afterglow is particularly well rendered; his other results in monochrome have the characteristic coarseness of texture of the process.

What licence Mr. S. Hollinger claims for slicing off the back of the head in his *Portrait* (No. 61) we do not know. It is a piece of affectation bordering on the grotesque. Again, we put it to Mr. Eickmeyer that in *Michael* (No. 80) he has allowed an obvious craving after eccentricity to blind him to the absurd. Michael is a little child looking at you through a window, against which his hands are pressed. The framework of the window is rendered with faultless accuracy, and there are the child and his two hands; but surely neither Mr. Eickmeyer nor the Hanging Committee of the Salon can be serious in asking us to suppose that a production of this kind is anything but a pointless joke!

The ladies make a brave show which demands mention. Miss Janet Reid, in *Learning her Paternoster* (No. 11), very cleverly depicts a little girl receiving instruction from an Italian-looking preceptress. Miss E. M. Robinson, a daughter of Mr. H. P. Robinson, makes, we believe, a first appearance in the exhibition world with *In the Spring Wood* (No. 64), a little child in solitary contentment amid pleasant surroundings; and Miss Francis B. Johnston sends several of her dainty portraits of ladies, manifesting unquestionable originality.

A pretty and photographically perfect study of a *Child with a Parasol* (No. 10) comes from Mr. H. Homeier, an American exhibitor. Three rustic scenes in Colonel Gale's well-known brilliant and incisive style are shown, and Mr. Charles Moss exhibits some examples of work with the bichromated-gum process, one, *A Suffolk Staithe* (No. 34) being really very effective. Mr. Thomas Manly's peculiar command of luminous effects finds exemplification in one or two characteristic portrait studies. In the portrait of *George Batten* (No. 67), Mr. R. W. Craigie shows perhaps the best bit of portrait work he has exhibited, the pose of the head is exceedingly fine, and we like the texture of the skin of the face which is lifelike in effect. *A Dryad* (No. 86) is a posterior study of the nude, which we scarcely think should have been hung. The artist, Mr. Langfield, has several idealistic contributions of a similar nature in the Gallery. We congratulate Mr. Fred Hollyer on a very striking nearly full-length *Portrait en Chapeau* (No. 97). It is unconventional yet natural in effect. Among Mr. Clement Hopkins's contributions, design of three figures, *Photography Receiving the Approbation of Science and Art* (No. 79), gives a hint of what may be attempted in decorative work by means of photography. Mr. Calland, with *At the Docks* (No. 127) horses hauling carts through the dock gates, shows a very good photograph of a commonplace subject.

The figure studies of Mr. F. Holland Day, notably the effect of contrast in *Bronze and Ivory* (No. 111), are exceedingly good. We congratulate Mr. Lionel Bennett on *A Rainy Day* (No. 147), the motion of the figures, the moistness and mistiness of the atmosphere being suggested with wonderful realism. Some very fine figure studies come from Zaida Ben Yusuf, an American exhibitor, his *Girl Reading* (No. 158) and *Study of Head and Back* (No. 164) showing great dexterity and originality in posing. Mr. E. R. Ashton's *White Wings* (No. 148) is a brilliant and glowing study of craft in Eastern waters, quite the best bit of work that he has shown. We have only space to mention that Messrs. H. P. Robinson, R. W. Robinson, Puyo, Bremard, Henry Stevens, F. H. Evans, Thomas La Begue, and Karl Greger are well represented in the Gallery.

The Exhibition, of which we have indicated the salient features, is full of the quaint, the eccentric, the unconventional, even the grotesque in photography—if photography it can be termed—and deserves to be visited, if only out of curiosity. But, all the same, it contains much sane and beautiful work, which, unhappily, is given the lowly office of sandwiching productions that are neither the one nor the other.

HISTORICAL PHOTOGRAPHS IN THE PHOTOGRAPHIC SECTION OF THE IMPERIAL VICTORIAN EXHIBITION AT THE CRYSTAL PALACE.

V.

The photo-mechanical processes are, historically, well represented at the Crystal Palace, and it will be seen that the majority of them are not of such modern invention that some surmise. The earliest examples of photo-lithography in half-tone we have noticed is No. 215, and bears the date 1859. They are the work of the late Mr. John Pouncy, and, although produced thus early, they are really very good indeed, and will compare favourably with some of the best work in this direction turned out to-day. Why a process, which at that early period was capable of yielding such good results, was allowed to lie in abeyance unworked for so many years, it is difficult to conceive. Messrs. Bullock Brothers, have also lent a frame of early photo-lithographs, also in half-tone (No. 56). These were produced by them in 1866, and very good they are. Like Mr. Pouncy's, they are little, if any, inferior to much of the present-day half-tone litho work.

The process by which Mr. Pouncy produced his results was not, we believe, published, but it was probably based upon his later "ink process," alluded to previously. Messrs. Bullock's processes were patented by them in 1865. One was based upon the use of a reticulated negative, obtained by placing a granulated surface in contact with an ordinary negative, and then making a copy by transmitted light; and from the transparency thus obtained a fresh negative was reproduced; from that a transfer was obtained on bichromated gelatine, or analogous substance, to be used as an ordinary litho transfer. In another method of obtaining a grain, the paper was printed with the reticulated pattern before the negative was printed upon it. Here is an extract from the specification of the patent:—

"In this case the specks of ink themselves form a medium, and, by their aid, excessive contrasts are avoided and half-tones secured. Such a picture, when so obtained, is passed to a lithographic stone or zinc plate, and a printed proof produced therefrom; by the aid of chromo-lithography coloured proofs may be produced." It is by this latter method, we imagine, that the prints shown were produced. The latest examples of photo-lithography shown are by Mr. Jas. Hyatt—reproductions, *facsimile* of ancient manuscripts, &c., and excellent they are.

Photogravure by the various processes is excellently portrayed, from the earliest period up to the latest date, some of the earliest being by the late Mr. H. Fox Talbot, and made in 1866. As early as 1852 Mr. Talbot patented a method of photographic engraving. It was this: A steel plate was coated with gelatine and bichromate of potash, dried, and printed. The plate was then washed to remove the unaltered bichromate and a portion of the unaltered gelatine. It was then treated with alcohol and dried, then it was etched with a solution of bichloride of platinum. A grain was obtained by printing through folded gauze, or similar material, before printing the photographic image.

Later on, namely, in 1858, Mr. Talbot patented a modification of his process, which differed somewhat from his first one. This he named "photoglyphic engraving." In this the film was not washed to remove the unaltered bichromate before etching. As soon as the image was printed the plate was dusted over with powdered copal, resin, or bitumen. It was then strongly heated, to melt the particles of resinous matter, and so fix them. The plate was then etched with a solution of perchloride of iron.

Now, it will be seen that the processes of Talbot did not differ so very materially from the process attributed to Klic, as worked at the present day. In Talbot's method the metal plate is etched through the even film of gelatine, the parts that had been more or less protected from light being more easily penetrated by the etching fluid than those which had been hardened by it. In the present method of working the gelatine, unacted upon by light, is removed, the partially unacted upon portions are partially removed, while, where the light has fully acted, the gelatine is of considerable thickness, so that the image is represented by varying thicknesses of gelatine as the resist, instead of being an even film of varying degrees of permeability by the etching solution. In the present method the metal plate is dusted with the resinous matter and heated before the gelatinous image is put upon it. Comparing the two methods, it will be seen that, after all, there is not such a very wide difference in the methods of forty years ago and that of the present day.

Up-to-date photogravure is well exemplified in Mr. A. Ernest Smith's reproduction of Mulready's picture, *Choosing the Wedding Gown*. This is an untouched plate, and for which Mr. Smith was, a couple of years ago, awarded the first prize of £20 and silver medal in the Society of Arts Competition for the best untouched photogravure plate of English production.

Other processes of photogravure are shown. Mr. Foxlee has lent a couple of examples (No. 226), by Paul Pretsch, 1859. One, *I Pays*, is from a negative by Rejlander; the other, *Undercliffe, Isle of Wight*, is from a negative by Roger Fenton. These works have an additional interest by reason of the artists who took the pictures. Pretsch's method of photogravure (1854) is different from the etching methods, and the grain, instead of being a mechanical one, is what may be termed a chemical one, as it is dependent upon the reticulation of the gelatine film itself, as in the case of the collotype process. It is really the swelled gelatine process with a reticulated surface to the gelatine. From this relief an electrotype is made as the printing plate. How far this process is capable of yielding good results these prints will show.

The same gentleman has also lent examples of his own work (1883) by the Waterhouse process, presumably his modification of it. That process, by which excellent results may be obtained, is this: An ordinary carbon print is developed on a copper plate, and, while still in a moist condition, it is dusted over with a gritty powder, which adheres to the soft gelatine, and, as it dries, the powder sinks in, according to the thickness of the film. When dry, the gritty matter is removed, leaving the gelatine with a grained surface; an electrotype of this is the printing plate. Mr. Foxlee has also lent another frame of his own work (1886) by an etching method, and a label states that only one solution was used in the etching operation. By the way, the use of a single solution in etching has, within the last few months, been claimed as a novelty.

Mrs. Smith has also lent an example of early photogravure of French production, though believed to be by an invention of the late Mr. W. B. Woodbury. This process is based upon the Woodburytype process, and is this: A gelatine relief—shallow relief—is made, but with the gelatine is incorporated a gritty matter, so that, when it is developed and dried, it has a gritty or grained surface. This relief is then squeezed in contact with a plate of lead, as in the usual way; from this lead mould an electrotype copper plate is made, which is the printing plate.

The first half-tone phototypic-process-block-printing shown is No. 225, date 1860, by Paul Pretsch. In this process the half-tones are not represented by ruled lines as at present, but by a reticulation, more or less open, according to the light's action, as in his intaglio process. Modern process work is well exemplified by Messrs. Waterlow & Sons and by the Meisenbach Company. This Company was, we believe, the first in this country to adopt commercially the lined-screen system of working. Frame No. 58 illustrates the different stages of the process. The first shows the photograph to be reproduced; the next, the metal plate with the bitumous lined image upon it ready for etching, then the plate etched and trimmed ready for printing from; and the last the print from that.

The Woodbury process is illustrated by loans from the Woodbury Company (Eyre & Spottiswoode) and Messrs. Waterlow & Sons, and by some of Mr. Woodbury's own early work, lent by Mrs. Smith. This process was invented by the late Mr. Woodbury, and patented in 1864. It is now so well known as to call for no special reference, except that the first method of obtaining the printing mould was by electrotyping the gelatine relief. The leaden mould, obtained by pressure, was an after-modification. The only recent modification of the Woodburytype process is one by the Woodbury Company. One of the drawbacks of the Woodburytype process was that the prints had to be mounted, which rendered them somewhat unsuitable for book illustrations on account of the cockling of the mounts. This is now overcome by the Woodbury Company by printing on a temporary support, trimming the print to size, and then transferring it to a final support with a suitable margin.

Amongst Mrs. Smith's (Sciopticon Company) other loans is an illustration of Woodbury's stannotype process, No. 216A, namely, the gelatine relief, the stannotype printing mould, and the print. The stannotype process is essentially the Woodburytype process, and was devised to obviate the necessity of the costly hydraulic press. Here is the process in the abstract. Instead of a negative being used for making the relief, a transparency, preferably a carbon one, is employed, so that a negative relief is obtained when it is developed, which is done on a glass plate, and it forms the printing mould. But before it is used it has to be coated with tinfoil; a thin solution of indiarubber in benzole is flowed over the relief, and then the foil laid on, and the whole is then passed between indiarubber rollers under heavy pressure. The tinfoil then takes accurately the form of the mould and adheres to it. The printing from this mould is just the same as from the leaden one in the original process.

While on Mr. Woodbury's numerous inventions, it will be well to direct attention to frame No. 44, Chromo-Woodburytype in different stages. In this process the colours are roughly produced on paper, by lithography, for example, on which is afterwards made a Woodburytype print in the ordinary way. These examples, which were produced in the "seventies," are very effective, and compare well with the more modern chromo work by which they are surrounded. One other invention of Woodbury's must be noticed, namely, "watermarking" paper—"filagrane." No. 274 is an example, and the date of the invention is 1867. The paper is rolled under heavy pressure between steel rollers in contact with a gelatine relief, and a very perfect imitation of a genuine watermark is the result. We have it on fairly good authority that the watermarks on some forged bank-notes that were passed some time ago were produced in that way.

We do not notice any very early specimens of collotype printing, but this may be classed as a comparatively modern process. This process offers advantages over the Woodburytype process, as the prints may be obtained direct with any margin that may de desired. Mr. James Hyatt shows how admirably collotype is adapted for the reproduction of ancient manuscripts, deeds, &c., and Messrs. Morgan & Kidd illustrate what their improved collotype process is capable of in the way of book illustrations, portraits, &c. They have also lent a fine example of collotype work (No. 52) of large size—about 24 by 18—*Tne Interior of St. Peter's, Mancroft, Norwich.* This firm's collotypes are, we believe, all machine-printed.

For many years there was a strong prejudice in this country against machines for collotype work. Our Continental neighbours eventually, however, convinced us that as good, or better, work can be done by machine than by the hand press, and now nearly all the collotype printing done here is done by machine. The examples shown by Messrs. Morgan & Kidd, and by the Messrs. Waterlow—also machine work—prove that England can now hold its own in the matter of collotype against the world. One additional advantage of machine printing is that the plates last longer than when they are worked in the hand press.

Before leaving the mechanical portion of the show we must call special attention to the fine collection of chromo-photographs, although space will not permit of a detailed description of them and the means by which they were produced. With Mr. E. J. Wall and the Photogram Company this branch has always been of special interest, and both have contributed largely to the exhibits—alike in early and the latest productions by the various methods—process block, chromo-collotype, &c. Amongst these exhibits is No. 51, three specimens of the earliest three-colour work ever done.

Messrs. Waterlow's frame (No. 41) is instructive, as it shows the three-colour work in the different stages. There is a print in the yellow, one in the red, and one in the blue. Then there is one with the red printed on the yellow, and another, the final, with the blue printed on the yellow and red print. The result of the three superimposed colours is an excellent and finished picture.

PHOTOGRAPHIC WORKERS AT WORK.

XVIII.—Messrs. Voigtländer & Sohn, Brunswick.

Messrs. Voigtländer enjoy the reputation of being the oldest firm of opticians, the business having been founded in Vienna by Christoph Voigtländer in the year 1756. The requirements of the times were so limited that for a number of years spectacles, reading glasses, simple microscopes, and small telescopes were the principal products of the business. But, at the beginning of the present century, Christoph Voigtländer's son, Friedrich, began the manufacture of periscopic spectacles, and in 1811 constructed the first Gallilean opera-glass. The business of the firm then increased rapidly. At this period of the firm's history, the early part of the present century, Fraunhofer made his important investigations concerning the refraction of light and improved the quality of optical glass. The third proprietor of the business, also named Friedrich Voigtländer, made himself master of Fraunhofer's optical discoveries, and, by means of a spectroscope of his own construction, determined the refraction and dispersion of the various kinds of glass at his disposal. He communicated these data to the mathematician, Professor Petzval, who computed the portrait lens, and, in the year 1839, Voigtländer made the first specimen of this lens, which will remain a lasting monument to Petzval's mathematical skill. About the year 1856 the lens was improved by making the focus of the chemical and visual rays coincident. Another lens, also of Professor Petzval's invention, was introduced about this time, although its construction was known by the firm as early as 1841. We refer to the orthoscopic, the first recognised attempt to cure the distortion of a single lens. The orthoscopic enjoyed an immense popularity for a time, so great, in fact, that the late Mr. Traill Taylor wrote in his book, *The Optics of Photography*, "there were some weak-minded photographers who scarcely dared venture to assert that any specially fine picture had perchance been obtained by the aid of the old-fashioned landscape lens."

But, whilst Messrs. Voigtländer were busy with improvements in photographic lenses, their activity was also directed to another important branch of practical optics. Opera and field-glasses were considerably improved, and the name of Voigtländer attained high reputation in this country in connexion with these instruments. Steinheil's invention of the aplanat was the next important invention in photographic optics, and, in 1877, the present proprietor of the firm, Friedrich Ritter von Voigtländer, introduced the euryscopes, which, in various series, have been for many years so well known for their excellent optical qualities. These lenses range in intensity, from *f*-4 for portraiture, to *f*-18 for copying purposes, and of recent years their quality has been further improved by means of the new Jena glasses. The improvement in these symmetrical lenses has been effected by substituting two very transparent crown glasses for the flints that had hitherto been used, but the wide-angle series, rapid as well as slow, have been entirely reconstructed. Subsequently, by arrangement with the firm of Carl Zeiss, Messrs. Voigtländer have manufactured their various series of anastigmats. With one exception these are non-symmetrical, and it has been Messrs. Voigtländer's aim to produce an anastigmatic lens combined with the advantages of the symmetrical type. These efforts culminated in the production of the Collinear, which is now manufactured in three series. Series II. is the most rapid, the aperture for the smaller sizes being *f*-5·4, and for the larger *f*-6·3. Series III. is of medium rapidity, *f*-7·7. Series IV. is constructed for wide-angle and copying purposes, and with full aperture works at *f*-12·5.

We recently had the pleasure of visiting Messrs. Voigtländer's extensive works, and were received by Dr. D. Kaempfer and Dr. A. Miethe, to whom are intrusted the scientific and technical interests of the firm. Under Dr. Miethe's guidance we were shown the process of lens-manufacture in its many various stages. Starting with the stock of optical glass, we were shown slabs of the most important kinds now used for photographic lenses. These are carefully tested for freedom from defects and for their optical qualities of refraction and dispersion. In giving the lens its rough, primary form, Messrs. Voigtländer's method differs from that generally adopted by other opticians. Instead of turning the glass on the lathe, suitable pieces are placed in moulds, and, after heating in a furnace, they are pressed into shape. They are then allowed to cool very slowly in the cooling oven, by which means the quality of the glass is preserved in a homogeneous condition throughout. Not only is considerable economy effected by this process, which is of importance with the more expensive varieties of glass, but the firm is rendered independent of the glass manufacturer in the production of lenses of large size. The pieces of glass thus roughly moulded to the desired shape are then fashioned to the requisite curves by rough and fine grinding, but the exact figure is given in the subsequent process of polishing with a mixture of pitch and wax coated with rouge. The workman takes the lens to the foreman as soon as he thinks it has acquired the requisite form, and it is tested by him with a proof glass. This proof glass is an exact counterpart of the true form of the lens that has to be made. The lens and proof glass are carefully dusted and fitted to each other. If the contact is perfect, the colour reflected is quite uniform; but, if there is any inequality, the phenomenon of Newton's rings makes its appearance and the lens has to receive further treatment. The larger the lens, the more rigorous is the test. It may here be remarked that sphericity of surface is more important than actual curvature. Obviously, the manufacture of these proof glasses requires great care and skill, and to test their curvature the spherometer is used. This instrument has a metal ring of known diameter, which is placed upon a metal plate. On the upper side, the inner and outer edges of the ring are half a millimetre apart The lens is placed on this ring, and, if convex, its surface rests on the inner edge, whilst, if concave, it rests upon the outer edge. A contact pin is actuated from below, passes through the plate, and is made to touch the surface of the lens. The pin indicates the height on a micrometric scale, which is read by means of a small microscope. From the data thus obtained the curve can be calculated with great accuracy up to $_{10}\frac{1}{000}$ of a millimetre. To prepare a proof glass for any given radius a convex and a concave surface are ground. If the contact of these two surfaces is perfect when they are superimposed, which may be known by the uniformity of colour reflected, it

may be assumed that the proof glass is correct, as it is highly improbable that both surfaces should have identically opposite errors. But the tools upon which the lenses are ground also have to be prepared with great care, and they are corrected after use for each set of lenses. A pair of these tools was taken from stock at hazard, and the contact of their surfaces was so perfect that the lower could be lifted by the upper, and held in suspension simply by exclusion of the atmosphere, notwithstanding their great weight. The stock of these tools numbers more than 20,000. The firm also has proof glasses for 700 different radii, numbering nearly 3000 in all. After polishing, the lens is centered and mounted. The centering is done on a lathe, and with such precision that the image reflected by the surface remains at perfect rest whilst the lens is in rapid rotation.

We then passed into the workshops, where brass and aluminium were being worked into lens mounts, opera-glass tubes, &c. Not only are the mounts finished by the firm, but all castings and all tubes are made upon the premises, with a view to securing the highest degree of optical perfection. A very interesting lathe was shown us in this room. With it a screw may be cut varying in pitch throughout its length in any desired manner. This lathe is of considerable value in manufacturing the mounts of field glasses with rapid extension until the focus is nearly found, when the movement slows down, and permits the fine adjustment to be made.

We next visited the testing-room and the photographic studio. All the photographic lenses sent out by the firm are tested experimentally with camera and plate. At one end of the room is the well-known screen covered with a mosaic of cross lines, circles, and printed matter in types of various sizes. For the smaller lenses a studio camera is used, but for large lenses a massive camera with screen five feet by four feet has been constructed. The focussing cloth of this piece of apparatus is a small room, but even this giant screen is too small for some of the lenses made by the firm for photo-mechanical purposes. The largest yet sent out had a focus of sixteen feet, and diameter of twelve inches. Some specimens of the collinear lens for various purposes were placed upon the smaller camera for our inspection, and gave excellent results for covering power, freedom from astigmatism, and fine definition. We were also shown a recently constructed lens for photo-astronomical purposes with aperture of f 2, and another specimen for photo-mechanical work with an arrangement for rotating the diaphragm in the mount. We inquired of Dr. Miethe if he thought we were approaching the limit of possible improvement in lens construction by means of the new Jena glasses. He thinks there is still a large field for work, and that we are far from finality.

The arrangements for the comfort of the workmen, the apparent harmony existing between employer and employed, and the perfect order everywhere visible throughout the establishment, are internal evidence of business success. In congratulating Messrs. Voigtländer on their past career of 140 years, we express the hope that they may long continue to hold the high position they have attained in the ranks of the optical world.

THE PRINTING PROCESSES OF THE FUTURE.

When one considers how much space has been devoted in photographic literature to the question of securing permanency in photographic prints, the idea occurs that all this patient research and toilsome effort is but energy wasted when various circumstances point to the not very distant time when photographers will have ceased to make their best prints with fickle chemicals.

Just as the Daguerreotype paved the way for the albumen or gelatine print, and thence on to carbon and platinum, so will these methods only lead, in the inevitable sequence of events, to the photo-mechanical print in pigment ink as the only really permanent method of multiplying photographic images.

Far-seeing men like Fox Talbot, Pretsch, and Woodbury long ago solved the question of permanency, and gave to the world photographs that were as permanent as the steel or copper-plate engravings which for fifty years or more have adorned our walls and embellished our books. But they were men before their time, and, as so often has been the fate of pioneers, the world was not ready for the reception of their ideas.

In the history of science and industry there always have been periods during which brilliantly conceived ideas have lain dormant and unappreciated, just as there have been periods which to contemporary eyes have seemed epochs of prolific progressiveness, but which are only accounted lost time when looked at retrospectively. Yet in all true progress it is perhaps a necessary corollary, that for a time we should go on believing that we have really hit the right thing, when time is to show that we have only been groping in the dark.

May it not also be thus with present-day photography, and may one not venture to predict that in a few years printing with the salts of silver will be as dead as the Daguerreotype? In such case we may expect to see photographic work divided into two parts: first, that which is intended to be ephemeral, and which time—if not human hands—will rigorously destroy; and, secondly, that which is to be retained permanently because of its being a faithful record or "a thing of beauty."

Every day the desire becomes keener to preserve, beyond all chance of being destroyed, the best photographs of our time. The Photographic Surveys are evidences of this desire, but who shall say that the records thus obtained will be indisputably permanent? Even platinum prints are not beyond suspicion. The greater pictorial merit of our *genre* photographs also makes the wish very strong of retaining them in a permanent form, and it is to be noted that the tendency of the school producing them is towards pigment printing.

At various times photographs, in the form of either mounted albumen prints, or bromides printed with a margin, have been tried for book illustrations, but in some cases such prints have deteriorated in a few years. How different it is with proofs from engraved plates or the printed matter in our best books. Let any one go into an old public library and examine the old books there, some of them dating back, maybe, almost to the introduction of the art of printing. The paper may have become a little mellowed with age, and it may bear a few time stains—which to the lover of books are not faults—but there is no fading, nor any loss of detail in the pictures, whilst the type is as clear as ever.

Thus we are taught the lesson by these old books that, if we would have permanence, the only permanent medium is printing ink, and to get photographs in printing ink we must adopt photo-mechanical processes.

The professional photographer will probably retort: When you can show results by the photo-mechanical processes equal to silver and platinum prints, we will then adopt these processes.

To that I would reply: If you had adopted these processes when they were freely offered to you by their inventors, and had worked at them as thoroughly as you have done at your present methods, the results by the one might have been equally as good as the other; but you have flouted and ignored photo-mechanical processes, and left them to be pioneered for the most part by men who had no previous knowledge of photography. Is it to be wondered at that their results have not attained your own standards and ideals?

Photographers are apt to doubt the possibilities of photo-mechanical processes because they see so much from them that is either poor or thoroughly bad. But it must be remembered that the best work is hardly likely to come under their notice except by accident: one cannot expect to find masterpieces of process work in sixpenny magazines or penny periodicals. The choicest examples of the photogravure process may lie hidden between the sumptuous covers of some *édition de luxe*, or be sold as prints for framing at a guinea or more a copy. In collotype too, how rarely is the best work seen? Certainly it is not to be found in the cheap view books which have flooded the market of late; certainly not in the numerous prints used for commercial purposes. But in such work as the illustration of the treasures of our national museums collotype has done what no other photographic or photo-mechanical process could have fulfilled.

Now, I wish to suggest that, in these two processes of photogravure and collotype, photographers will find all the possibilities of expression they desire in printing from their negatives, and, moreover, these processes have the merit of producing those absolutely permanent prints which are so desired by the conscientious photographer; but, what is more, these processes possess such an infinite adaptability, by reason of its being possible to make prints on quite a variety of papers, fabrics, and other materials. How one may revel in margins, and ring changes on deckle edges and flush edges, and have infinite choice of surface, and thickness, and tint. Then again, see what a potentiality there is in the selection and admixture of printing ink; what variety and vagary may not be achieved by the photographer who is artistically inclined. Yet, more, with what cunning may not the ink be thinned down with a little turps, and the rough paper print worked up with the brush so that the most critical of exhibition judges shall never know? How daintily, too, can titles be engraved or printed in the margins; and then, for the best work, we may have "proofs before letters" to be treasured by the connoisseur. Later, as the process of photogravure becomes more universal, there will spring up a little band of workers—a "linked ring" perhaps—whose

work will be distinguished from the rest by their ability to work up their plates by rebiting, and with burnisher, and scraper, and roulette.

Thus will the photogravure process become the artistic photographic process of the future, and the various other printing processes will have been relegated to the production of the "usual thing"—for it is not to be supposed that we predict a time when *cartes* and cabinets will be printed off by the photogravure or collotype process. No doubt, there will be portraits of such merit and of subjects so estimable that it will be considered worthy to reproduce them in photogravure—as, for instance, presentation portraits of public men—but the generality of portrait work will continue to be done by the methods of to-day.

For view work and commercial photography the collotype process—or modifications of it which will come about through this method being more widely practised—will be found to fulfil the highest technical requirements, and its permanency will render it highly preferable to silver prints. Moreover, the possibility of printing with white margins and with great variety of paper and ink makes it a process of great adaptability and of the widest usefulness.

Readers who are with me thus far will ask: Is it not difficult to work these processes? Do they not require expensive plant and technical skill?

In answer, I can say that the difficulties are not exceptional, and are no more than are to be found in beginning to learn most photographic processes. Moreover, when I recollect the names of many prominent workers who were originally photographers or printers, and in some cases engaged in quite different avocations, I can only say, what one man has done another may do by equal diligence and perseverance. Again, it is easier to learn these processes now than it was a few years ago, because of the much greater amount of technical information available. As to the plant required, either for photogravure or collotype, it is ridiculously modest, unless one goes in for printing presses for large and quick work; and this would be useless for a photographer making a beginning. Many a collotype and photogravure worker has devised and made with his own hands most of the special appliances for his work, whilst many other things have been improvised, and he has thus had to spend very little at first in starting the process.

So far I have refrained, it will be noted, from speaking of the half-tone process. This stands on quite distinct lines, and does not possess the same interest to the purely photographic worker. Yet it must be stated that this process is bringing photography into closer and closer touch with the letter-press printer. The Woodburytype process, or rather the simplified Stannotype—a most beautiful method—which the late Mr. Woodbury so vainly tried to get photographers to take up, will, no doubt, come to the fore again, but photogravure and collotype are really the processes which will go, hand in hand, to meet the greatest industrial and artistic needs of photography, and few can realise the destiny of these and other photo-mechanical processes.

WILLIAM GAMBLE.

PHOTOGRAPHIC ENERGY OF THE LIGHT OF FIREFLIES.

A VERY interesting investigation of the luminous and other radiations emitted by fireflies has just been published in the ninth volume of the *Journal of the College of Science*, Imperial University, Tokyo, Japan, says the *Lancet*. The author, Mr. H. Muraoka, who writes in German, is Professor of Physics at Kyoto. He mentions that the spectacle produced by the fireflies about the middle of June is one of the sights of the place, and he states that the present inquiry was suggested to him by the resemblance of their light to that of fluorescent bodies, some of which have been shown by H. Becquerel to emit radiations possessing properties analogous to those of the Röntgen rays. The flies are most luminous from about six p.m. to eleven p.m. The experiments were made by placing a number of them, varying from 300 to upwards of 1000, in a small flat box in which they were confined under a net made of hemp ("deren Wegfliegen mit einem Hanfnetz verhindert wurde"). The box also contained a photographic dry plate, in contact with which were plates of various metals (copper, aluminium, zinc, and brass), all of similar thickness, sheets of cardboard, both entire and also with cruciform patterns cut out of them, being sometimes interposed between the sensitive plate and the metal and sometimes used alone with the sensitive plate. Thin wooden boards were also employed for the same purpose. The sensitive plate and the objects in contact with it were wrapped in several thicknesses of black paper and left in the box with the flies for two nights. The experiments were made in a photographic dark room, sunlight and artificial light being carefully excluded. The sensitive plates, though thus wrapped up, and additionally protected by metallic plates and layers of cardboard, gutta percha, cloth, silk, &c., were always more or less blackened.

Professor Muraoka makes frequent reference to papers published in *Nature* in the early part of 1896 by Dr. John Macintyre, of Glasgow, and Mr. J. J. Thomson. His experiments led him to the following conclusions: 1. The light of the flies in its original state behaves like ordinary light. 2. The light contains rays which pass through cardboard, metal plates, &c., and possesses properties analogous to those of Röntgen rays or Becquerel's fluorescent rays. 3. When the photographic plate is covered with layers of cardboard, it presents an appearance which calls to mind the permeability of iron to magnetic lines of force. 4. The properties of these "filtered" rays appear to be influenced by the materials through which they have passed, perhaps by the thickness of the materials. 5. The properties possessed by the radiations and specified under No. 2 are apparently non-existent, or at least undiscoverable until after "filtration." The Röntgen rays are similarly undiscoverable until after "filtration"—*i.e.*, through the glass of the Crookes' tube—and "filtration" may, perhaps, afford a means of rendering the X rays homogeneous. 6. The "filtered" firefly rays undoubtedly admit of reflection. Refraction, interference, and polarisation could not be demonstrated, but Prof. Muraoka is of opinion that they take place. 7. The "filtered" firefly rays seem to resemble Becquerel's fluorescent rays in possessing properties intermediate between the ultra-violet rays and the Röntgen rays.

AUTOMATIC PRINTING ON BROMIDE PAPER.

[Anthony's Bulletin.]

THE introduction of an automatic exposure and developing machine for bromide paper has already done a great deal in surmounting the difficulties attendant on the proper and uniform printing of this paper; but the machines heretofore in use are intended more for the wholesale production of large numbers of photographs, and are of no actual benefit to the professional photographer, who may want only a limited quantity from one negative. It may, therefore, be of interest to professionals to hear that a new apparatus has recently been invented which admits the most exact and uniform printing on bromide of silver paper in the simplest and surest manner.

The inventor of this automatic printing apparatus is the well-known manufacturer of photographic papers, Mr. E. Buéhler, in Baden.

The apparatus in question is of extremely simple and ingenious construction and perfect working. The printing is done by kerosene light in a specially constructed lamp. The time of exposure can be regulated by the movement of a shutter, so that negatives of any density can be printed with absolute safety. By this means, with a negative of a certain quality, the determined time of exposure is always the same as long as the shutter remains in the same position, so that a thousand pictures from the same negative can be produced with equal exposure.

To proceed with the exposure, into the part of the apparatus which represents the printing frame insert the negative; the paper, which is on a spool, and whose width corresponds always to the length of the negative, is laid upon the latter, and the frame is then closed. A metallic ball belonging to the apparatus is now thrown into the opening of the shutter, where it is held fast until exposure commences. By pressing a lever, a trap will open, allowing the light to fall on the negative, while the ball is simultaneously set in motion. As soon as the determined time of exposure is past, the ball automatically closes the trap, and all that is then required is to move the paper to the width of the negative, thus making ready for another exposure. The pictures are developed in a long tray in such a way that a piece of the roll, comprising each time a length of six cabinet pictures, is cut off, put into the tray, and developed in one piece.

Exposure and development require very little time, so that in one day the printing of a week can be done.

The tone obtained is very handsome, and the prints are plastic and strong. Any of the well-known developers are suitable.

There is no doubt that this printing apparatus will, within a short time, be a general favourite among photographers.

It has already been patented in some countries, and will be in the market very shortly.

J. Joé.

PHOTOGRAPHIC COPYRIGHT UNION.

THE Annual General Meeting of the Photographic Copyright Union was held on Wednesday, September 29, at St. James's Hall, Piccadilly. Mr. Frank Bishop took the chair, and among those present were Messrs. J. J. Elliott (Vice-President), W. Grove (Treasurer), J. Lillie Mitchell (Hon. Secretary), W. Downey, Alfred Ellis, J. Lafayette, H. N. King, H. S. Mendelssohn, F. G. O. Stuart, T. Fall, H. W. Barnett (Falk & Co., Sydney), Henry Gower, and many others.

The President, in his introductory observations, said that the Union was still growing. Many photographers, however, imagined that they were not likely to have any photographs which required to be copyrighted, but this frequently turned out to be a mistake. The Union always endeavoured to satisfy members who appealed to them, and each

case was examined in its various points, so that no mistake should be made. After four years' experience, it had been found that the Rules were right in principle, so that, with the exception of Rule XXIII., there was no occasion to propose any important change. After other observations, the President said it was the desire of the Copyright Union to be useful to photographers in other respects.

Mr. Lillie Mitchell (the Hon. Secretary) read the report of the Committee as follows:—

"In presenting their Third Annual Report, at the expiration of the fourth year of their existence, your Committee have pleasure in stating that the position of the Union continues to improve and the number of members to increase. It is with pleasure that they are able to state they have given satisfaction to most of the members with whom they have been in communication with respect to infringements of copyrights. There has been a considerable increase of business transacted on behalf of the provincial and colonial members. The financial position of the Union is satisfactory. The reserve fund remains intact, but the working expenses have slightly exceeded the receipts. The Committee beg to remind the members that, as there is no annual subscription, they rely on donations to carry on the work of the Union.

"In accordance with Rule IX., the two members of the Committee who retire by rotation are Mr. Joseph J. Elliott and Mr. W. E. Downey. These gentlemen offer themselves for re-election. Mr. Thomas Bedding and Mr. H. H. H. Cameron have kindly audited the accounts and certified as to their correctness."

The following amendments to the Rules were made:—

"Rule IV.—To delete the words 'free from any subscription' after the words 'honorary members.

"Rule IX.—After 'Treasurer' read 'an Hon. Secretary.'

"Rule XVI.—To read, 'A General Meeting of the Union shall be held at the end of September or the beginning of October each year,' &c."

On the proposition of Mr. Alfred Ellis, and after considerable discussion, it was decided that Rule XXIII. should read: "That no member shall allow a copyright portrait photograph, or figure subject, belonging to him *to be reproduced* (whether registered or not) at a less fee than 10*s*. 6*d*. up to and including cabinet size, 6 × 4 inches, or for 1 guinea reproduced beyond cabinet size and up to and including 12 × 10 inches, on each occasion and for each different publication or form in which it is used, but he shall be at liberty to charge a larger fee, according to his own ideas as to its value.

"No member shall allow a copyright photograph of landscape or public ceremonials which belong to him to be reproduced for a less fee than 10*s*. 6*d*."

The Auditors were re-elected, as were Messrs. J. J. Elliott and W. E. Downey, the retiring members of the Committee, to which the name of Mr. W. Crooke, of Edinburgh, was added.

Mr. T. Fall then addressed the meeting in reference to a proposition that the National Association of Professional Photographers should join the Photographic Copyright Union. He said: "At the annual meeting of the N.A.P.P. on Saturday last, at which I was induced to be present, the attendance was so small that a quorum could not be formed. In the unavoidable absence of the President, I was asked to take the chair. The proceedings, of course, were informal. Two prominent members of the Copyright Union being present, it was suggested what a desirable thing it would be if the two Associations could be merged into one, thus bringing town and country members of both into closer union, and enlarging the sphere of usefulness by such union. The paying membership of the N.A.P.P. at present is from seventy to eighty, with a good balance in the bank. The difficulties attending its working have been many, and, unlike the Copyright Union, the members are scattered, and have few opportunities of meeting either for business or social intercourse. While the proposal I have made to you to-night is at the request of some of the leading members of the N.A.P.P., the general body have not been consulted, and the result of such proposal will be embodied in a circular letter, and sent to every member."

A long discussion ensued on Mr. Fall's remarks, which were, on the whole, favourably received. Ultimately it appeared to be understood that the Photographic Copyright Union would welcome the support of members of the National Association of Professional Photographers. A vote of thanks to the Chairman closed the proceedings.

NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

The First General Meeting of this body was held in the rooms of the Royal Photographic Society, at 12, Hanover-square, on Wednesday, September 29, Sir Benjamin Stone in the chair.

The minutes of the preliminary meeting, which was held at the St. Pancras Hotel, on July 8, were read by Mr. G. Scamell, who had been then appointed Honorary Secretary, and were confirmed.

The Chairman said that the committee appointed at that meeting to draw up and formulate rules for the guidance of the Association had had several meetings, and its report, which took the form of draft rules, was now ready, and would be laid before the meeting.

The following rules were then read and agreed to:—

1. That the Association be called "The National Photographic Record Association."

2. That the aim of the Association shall be to obtain photographic records of all objects and scenes of interest in the British Isles, and to deposit them, with explanatory notes, in the British Museum, where they may be safely stored, and be accessible to the public under proper regulations.

3. That the constitution of the Association shall be as follows: Patron, Vice-Patrons, President, Vice-Presidents, and other officers and members.

(*a*) Vice-Presidents shall be elected annually; the qualification shall be a subscription of one guinea per annum.

(*b*) Members shall be representatives of photographic, scientific, archæological, literary, artistic, or any other learned societies, not exceeding three for any one society, upon payment by the respective societies of an annual subscription of one guinea.

(*c*) Members, whose qualifications shall be—(1) a contribution of photographs to the number of six approved prints for the year; or, (2) a subscription of not less than ten shillings per annum, or a life subscription of 5*l*.

(*d*) Members, who shall be honorary county or district secretaries, whose appointment shall be made by the Council, and confirmed at each annual meeting, whose duty it shall be to collect photographs in their respective localities.

4. The business of the Association shall be transacted by a Council, consisting of the President, Secretary, Treasurer, Curator, and twenty Members, all of whom shall retire annually, and be eligible for re-election. The Council shall be elected at the annual meeting, and all Members of the Association shall be entitled to vote, and shall be qualified for nomination.

5. The Curator shall keep an account of the collections of the Association, including particulars of photographs received from time to time, for which he shall give a receipt on behalf of the Association to the respective donors. He shall also prepare a list of photographs received during the year, with the names of the donors, for the purpose of being printed and circulated.

6. The annual meeting shall be held in the month of February.

7. The ordinary meetings of the Council shall be held in February, April, June, October, and December.

8. Voting at all meetings shall be by show of hands, the Chairman for the time being having the right of a casting vote in the event of votes being equal.

9. At an annual meeting seven shall form a quorum, and at a Council meeting three shall form a quorum.

10. Subscriptions shall be due on January 1 of each year.

11. The Council shall have power to fill up any vacancy in their own body occurring in the interval between the annual meetings, and to make by-laws, such by-laws to have the sanction of an ordinary meeting before coming into effect.

12. These rules shall only be altered at an annual meeting, or a special general meeting called for the purpose. Notice of proposed alterations shall be given, in writing, to the Secretary, one calendar month before the date of such meeting.

By-laws:—

1. Photographs must be printed in carbon, platinum, or other permanent process, and be deposited, unmounted, with the Curator, who shall have them uniformly mounted upon official mounts provided for the purpose.

2. For the sake of uniformity whole-plate ($8\frac{1}{2}'' \times 6\frac{1}{2}''$) shall be regarded as the standard size for photographs. Two or more prints of a smaller size may be placed on one mount. Photographic enlargements beyond whole-plate size are not recommended.

In all cases it is desirable in taking pictures that a relative scale of size should be indicated. Thus a man or child might appear in an archway, or near a boulder stone, or a measured rule might be introduced where more scientific accuracy is desirable.

It was proposed from the chair, and carried with applause, that application should be made through the proper channels, with a view to secure Her Majesty the Queen as Patron of the Association.

The following officers were then elected:—

President—Sir J. Benjamin Stone.

Hon. Secretary—Mr. G. Scamell.

Hon. Treasurer—Mr. Alexander Graham.

Council—Captain W. de W. Abney, C.B., F.R.S., Mr. Harold Baker, Mr. L. Clark, the Right Hon. the Earl of Crawford, K.T., F.R.S., Mr. C. E. Fagan, Mr. L. Fletcher, Mr. St. John Hope, Mr. B. E. Lawrence, Professor R. Meldola, Mr. E. C. Middleton, Dr. H. R. Mill, Mr. Ralph Nevill, Mr. Philip Norman, Mr. G. Patrick, the Right Hon. the Earl of Rosse, Sir E. M. Thompson, Mr. J. Thomson, Mr. H. Snowden Ward, Mr. W. W. Watts, and Sir H. Trueman Wood, M.A.

It was agreed that the appointment of Hon. Curator should be deferred for the present, Mr. Scamell consenting to act in that capacity, as well as Hon. Secretary, for the time being.

It was proposed by the President, and carried unanimously, that a letter should be sent to the press, stating the objects of the Association, giving a short history of its formation, and inviting the co-operation of the general public in making the movement a success.

The nucleus of the Association's collection will be found in one hundred photographs of the Houses of Parliament, which were thereupon presented to the Association by Sir Benjamin Stone, who was thanked by the meeting for so doing.

A discussion ensued as to the best means of arranging for the collection of photographs in county museums, as well as in the British Museum, and it was agreed that it should be clearly pointed out that the Association regarded this as very desirable.

The meeting closed with a vote of thanks to the Chairman.

Curious Mirage.—A contributor to the *Weekly Times and Echo*, who has just returned from the Yukon Gold fields, in a very interesting article in a recent number, incidentally gives an account of a remarkable mirage, which, it is said, always occurs in those regions towards the end of June or thereabouts. The puzzle, of course, is, What "city" is it that is reflected? The correspondent quoted says: "Early one morning, as we were tumbling out of our cots, Joey (the Indian) came rushing in, exclaiming, in his own picturesque fashion, that the Manitou had shown him his celestial abode. We hastily scrambled out of the wigwam, and craned our necks to catch a glimpse of the lost Eden, or whatever it might be, and sure enough there unrolled itself to our astonished and enraptured eyes a most wonderful mirage. It looked like some immense city of the past. Domes, minarets, spires, belfries, houses, streets, everything was as complete as could be, but in vain we racked our brains to see whether we could locate the curious place. Not one of us could form the remotest idea in what part of the world this settlement could be in. Some guessed at Toronto, others Montreal, and one of us even suggested Pekin. But whether this city exists in some unknown world on the other side of the North Pole or not remains to be proved. Nevertheless, it is a fact that this wonderful mirage occurs from time to time yearly, and we were not the only ones who witnessed the spectacle. Therefore it is evident that it must be the reflection of some place built by the hands of men."

Our Editorial Table.

The Paget XXXXX Plates (Backed).

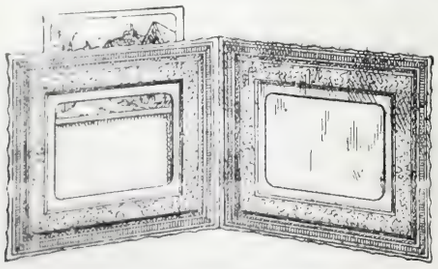
The Paget Prize Plate Company, Watford.

Much discussion has recently appeared in our columns relative to the removal of the collodion backing applied to the Paget Company's plates. We have had an opportunity of testing the matter for ourselves, the Company having sent us a packet of their Backed XXXXX plates for the purpose. The quality of these plates is of a very high order. Their sensitiveness is certainly as great as that of any plate that we have recently used, and this is saying a great deal, while the fineness of deposit and delicacy of image yielded show that the highest care is expended in the preparation of the emulsion. With regard to the removal of the backing, we were surprised at the ease with which this could be accomplished after the fixed plates had been removed from the wash water. The stained collodion is quite easily detached from the glass by means of a knife, while the application of a brush to the surface and a rinse under the tap soon leaves the back of the negative quite free from any fragments of film. The backing is extremely efficacious in minimising halation, as we proved by the practical test of exposing some of the plates on an interior subject, in which experiment they behaved admirably.

Christmas and New-year's Mounts.

George Houghton & Son, 89, High Holborn, W.C.

Messrs. Houghton have sent us a varied assortment of Christmas and New-year's mounts for photographs. These include ivory em-

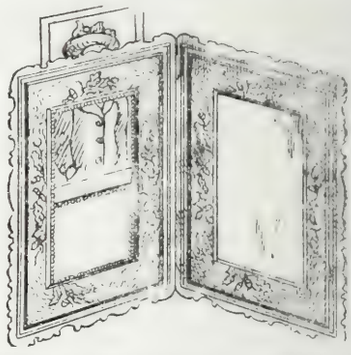


bossed folding slip mounts for either unmounted or mounted photographs, grey embossed folding slip with floral designs, grey embossed only, the Vandyke white embossed, *crêpe* plate sunk with fancy gold bevelled edges, and other kinds. The mounts are very tasteful in





design throughout, and the inscriptions are brief and suitable. Some of the designs are coloured by hand, outlined in gold and spangled in



gold and silver. The illustrations give some idea of the variety and beauty of the mounts, which should successfully appeal to photographers, as they are apparently as cheap as they are good.

Catalogue Received.

Voigtländer & Son, Brunswick. London Branch: 92, Hatton-garden, E.C.

A copy of Messrs. Voigtlander's latest catalogue has been placed before us. It is prefaced by a brief history of the firm, and a note on the properties and choice of lenses. The catalogue extends to about thirty pages, and, in addition to particulars of the firm's well-known euryscopes, collinears, and other specialities, gives prominence to an extra rapid lens for astronomical work, full aperture, *f*·1·8; the collinear lens, *f* 5·4, for cinematograph cameras; threefold cemented achromatic magnifiers; non-symmetrical collinear lenses, &c.

News and Notes.

The City offices of the British Photoprint Company have been removed to 17, Farringdon-street, E.C.

Royal Photographic Society.—Ordinary Meeting, Tuesday, October 12, at eight p.m., at the Gallery, 5A, Pall Mall East. The President's Annual Address and the presentation of the medals.

Photographic Club.—Wednesday evening, October 13, at eight o'clock, Open Night. *Slides from Negatives taken during the recent Photographic Convention at Yarmouth.* Members of Convention specially invited.

Messrs. Rheinlander & Co., process engravers, &c., announce that they have taken premises at Bouverie House, Salisbury-square, E.C., and have appointed a representative specially to undertake the management of the branch.

The Sandell Photographic Exhibition has reopened at the Modern Gallery, 175, Bond-street, and consists of 400 subjects, the majority never before photographed, including the City Companies' Hall, the Guildhall and Mansion House, Lincoln's Inn, Gray's Inn, Lambeth Palace, Westminster Abbey, Windsor Castle, the Monuments in St. George's Chapel, and the Albert Memorial Chapel, Windsor, St. Peter's, Rome, St. Mark's, Venice, &c. The Exhibition is open from ten a.m. to six p.m. daily, and there will be Lantern Illustrations and Practical Demonstrations of how to make Lantern Slides on Wednesday and Friday evenings.

On Saturday evening what might might have ended in a serious disaster but for the promptitude and presence of mind of two or three individuals occurred at Tong Park Wesleyan Chapel, Baildon, near Bradford. An animated photographic entertainment was being given to a crowded audience when an explosion of gas occurred in the apparatus and set fire to some draperies above. A large flame rose to the ceiling and instantly there was a panic, many persons probably having recollections of the Paris catastrophe. Fainting women and children were trampled under foot, and there appeared little hope of clearing the building without serious loss of life. The promptitude and presence of mind of the entertainers, however, who cut off the gas from the apparatus, prevented

the fire from spreading. A number of men, with more courage than the rest, by superhuman efforts, got the crowd out. The entertainers and a girl were seriously burnt about the hands and face, and a large number of others were badly bruised. Damage amounting to about 50*l.* was done to the apparatus and "living pictures."—*Daily Telegraph.*

THE Hackney Photographic Society's Annual Exhibition will be held at Morley Hall, Triangle, Mare-street, Hackney, on Tuesday, Wednesday, and Thursday, November, 16, 17, and 18, 1897. The Exhibition will be opened, on November 16, at 7.30, the succeeding days at four p.m. till ten p.m.; the prices of admission each day will be, between four and six, 6*d.*; afterwards, 1*s.*, and arrangements will be made for continued instrumental concerts of a high class character, lantern displays, cinematograph, X rays, &c. The Judges are Messrs. F. A. Bridge, J. A. Sinclair, and E. J. Wall, the Hanging Judge being Mr. Alexander Mackie. The following are the classes: Members—Class A, Any Picture taken since last Exhibition. Class B, Pictures taken during Membership. Class C, Best Picture taken in Hand Camera. Class D, Set of Four Slides. The Open Classes are—Class E, For any Picture not previously having received an award. Class F, For Portraiture and *Genre* (in this class the work may be that of a firm and need not be that of the exhibitor alone). Class G (Champion Class), For Pictures which have previously received awards. Class H, For Four Lantern Slides not having previously received awards. Class I (Champion Class), For Four Slides which have previously received awards. Class J (Stereoscopic), Set of Four Prints or Transparencies. Extra entry forms and all further information respecting Exhibition, can be obtained from Mr. W. Fenton-Jones, Hon. Secretary, 12, King Edward-road, Hackney, N.E.

THE other day a Dr. Marsden was arguing before a Sanitary Congress that murder and violence were promoted by picture posters on the walls. Well, the picture poster, together with other street and wayside advertisements, has sins enough to answer for on artistic and hygienic—yes, hygienic grounds. To speak of it as an incentive to crime is on a par with that other theoretical futility, constantly trotted out, namely, the pernicious influence of the penny dreadful. Such views belong to the anti-scientific period, when it was believed that all people were naturally good, and that circumstances alone corrupted them. I had hoped that the excellent Dr. Smiles was the last of the race who held that the raw material of humanity could be moulded to anything. Dr. Smiles kept his eye on the good, and laboured to show the rising generation how, by taking thought, they might become great engineers, great inventors, great poets. Dr. Marsden thinks it enough for the rising generation to study the pictorial advertisements of the day in order to develop wickedness. What men of true observation, however, are beginning to see—nay, do see clearly—is that the nature of the man or the boy must be looked for, so to speak, within the four corners of his system, and that circumstances have quite a subordinate share in the moulding of character or aptitude. The vulgar picture poster may inspire unholy thoughts—I confess it does, occasionally, in my own bosom, when I am seized with a desire to destroy it. But all picture posters are not in this category; some have claims to artistic merit, and it may be that upon the masses they exercise the soothing influence of art. I should like to see somebody take in hand the horrible advertisements that disfigure the landscape by road and rail, and the still more irritating electric contrivances that wink by night at every important street corner in central London. In speaking just now of the effect of advertisements upon the public health, it was of these new-fangled instruments of torture I was thinking. They add appreciably to the wear and tear of life. In this commercial age, I suppose, there is little hope of our obtaining relief from these inflictions. One can only sigh for a benevolent despotism to arise and sweep them away. Yet, on hygienic grounds, which are nowadays recognised as important, I fancy a good case could be made out against unquestionable eyesores, and more especially against the fluctuating electric advertisement.—*Referee.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
11	Bradford Photo. Society	*En Velo in the Pyrenees.* H. Mortimer.
11	North Middlesex	Paper by T. Bedding, F.R.P.S.
11	Richmond	*Photographic Advances of the last few years.* T. C. Hepworth, F.C.S.
12	Brixton and Clapham	Discussion: *Under-exposure and its Treatment.* Opened by Jas. Price.
12	Hackney	*Clouds in Photography.* A. Horsley Hinton.
12	Manchester Amateur	*Life and Sights in Japan.* Joseph Seel.
12	Royal Photographic Society	President's Annual Address and Presentation of the Medals.
13	Borough Polytechnic	*Lantern-slide Making.* John A. Hodges, F.R.P.S.
13	Croydon Camera Club	Council Meeting.
13	Leeds Camera Club	*Photo Ceramics.* Mr. Elliff.
13	Leytonstone	*Stereoscopic Photography.* W. J. Ball.
13	Photographic Club	Members' Open Night: Slides—*Pictures taken at the Yarmouth Convention,* &c.
13	Southland	Lantern Slides.
14	Ashton-under-Lyne	Demonstration with the Acetylene Gas-light. Stephen Sharp.
14	London and Provincial	*What is a Good Negative?* J. E. Hodd.
14	Manchester Amateur	*Enlarging by Limelight: Bromide Paper.* J. Shaw.
14	Manchester Photo. Society	Annual Meeting.
15	Borough Polytechnic	*Presto Printing.* A. Bedding.
15	Croydon Microscopical	Discussion on September Portfolio.
15	Wakefield	*Printing, Toning, and Finishing.* Hon. Secretary.
16	South London	Excursion: Broxbourne. Leader, Mr. Goddard.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 30,—Mr. P. Everitt in the chair.

Mr. A. L. HENDERSON related how he had found, in a bundle of photographic literature, some old prints, which he considered to be about twelve or fourteen years old. They were unfixed and appeared to be examples of microphotographic subjects. Having fixed them, he thought the members would be interested in them, and called particular attention to the fact that the impression of the letterpress visible on the prints was *positive*, and not in negative form, as usually was the case. He also made a few remarks regarding his emulsion experiments and the relative sensitiveness of some of his plates to the Warnerke sensitometer and in the camera, in the latter case showing much more rapidity. A form of sensitometer, in which the different densities were given by a metal plate, having in each section an increasing number of accurately drilled holes, was likewise brought forward by Mr. Henderson.

NOTES ON SOME LITTLE-KNOWN DEVELOPERS.

Mr. EDWIN BANKS delivered a lecture on *Some Little-known Developers*, a short account of which is given below. The lecture was necessarily much intermixed with equations and chemical formulæ, introduced to explain the reactions in the processes of development by different substances. Development, he said, played the most important part in the production of photographic pictures, and the methods of development were almost innumerable. No new developers were wanted unless they were better than those we already had, and it was not his intention to bring forward any addition to the already well-stocked list, but rather to refer to the comparatively unknown and any modifications of sufficient interest. Roughly classified, developers were of an organic or an inorganic nature, and it was of the latter species he wished principally to speak. A few months ago Mr. Chapman Jones read a paper on *Negative-making* before them, in which he advanced the proposition that a perfect negative should consist solely of pure silver in clean gelatine. This proposition was subjected to some considerable criticism, and it was plain that the majority of his audience had a leaning towards the imperfect negative containing the "mud," as Mr. Chapman Jones termed the stain. Mr. Banks's opinion of the much-sought-for negative, composed of both silver and stain was bad, and he agreed with Mr. Jones that the negative should be of pure silver in pure gelatine. To this he would add, for his own part, a definition of what a perfect developer should be. It was one the oxidation products of which should be perfectly soluble either in the developer itself or in pure water; in other words, it should be one which would not produce any insoluble matter in development; and it was only by such means, he said, that photographers would be able to get their negatives of pure silver and gelatine. Having referred to some experiments made by Lumière Brothers some years ago as to the constitution of the developer, he was led up to the proposition that a developer should have the physical power of forming water, in which connexion he recalled the fact that he had advanced the theory that water was the only developer, and that it was the decomposition of this which produced the visible image on the plate. He proceeded to show how the formation of water was brought about in the process of development. To come to the actual by-paths of development, he supposed the use of salts of iron was generally known, the ferrous-oxalate developer, for instance; but there were other methods by which it was possible to develop, although he would not say they were very practical. At this point some of his results were passed round, it being explained that they were shown simply as curiosities and not as pictures. Of these, one was developed with oxide of iron, being dipped into a solution of ferrous sulphate and afterwards immersed in a carbonate-of-soda bath, which gave rise to the formation of ferrous carbonate, which in its turn rapidly absorbs oxygen from wherever it can, and so produces development. A modification of this, the sulphate of iron being followed by ammonia, was also shown; and a third developed by tin (a solution of stannous chloride followed by ammonia), which was perhaps the worst of the three. Some few weeks ago he made a short statement about developing with chloride and bromide of copper. In the course of experiments he had found that these salts were exceedingly powerful as developing agents, possessing greater power than pyro or any other agent. It was very peculiar in its action; development took place instantaneously, at most in three or four seconds for complete development, and, if one covered the dish and left it for a short time, he would return to find a clean plate again. The developer has developed and undeveloped, and the image has vanished; so it is necessary to remove the plate exactly at the right time, or else the image will be lost. The difficulty was to restrain its energy to reasonable proportions for practical work, and he had tried many methods to this end, and eventually with some success. There was another feature about this developer. It was so energetic that it was difficult to keep the plate from fogging; but there was a double chance of getting a negative, either when the image was coming on or going away. The preparation of the solutions and the means adopted for restraining their action were described at length. The results seem somewhat promising, and one developed with bromide of copper and ammonia, and one with cuprous chloride and ammonia were passed round. Mr. Banks proceeded to add, however, that neither cuprous chloride nor cuprous bromide was a developer at all. He came to this conclusion from the reactions which took place on mixing with the ammonia, and to describe these he would have to resort to equations. The result of this was to show that the development was not due to the chloride or bromide of copper, but that the actual developer was the cuprous oxide formed by oxidation in the alkaline solution. This was pointed out by Carey Lea. A number of examples by the cuprous-oxide developer were shown. The solution consisted of cuprous oxide and ammonia in gallic acid, the latter acting as restrainer, though not to perfection. This comes pretty near to the definition he laid down for a perfect developer. He then considered the hydroxylamine developer. This was apparently but little known, which was not surprising when its action was considered. The process of development gave rise to nitrous-oxide gas, which was liberated in the film itself and was the direct cause of blistering and frilling of the gelatine. Examples of this method were shown. He recommended the addition of glucose or oxidised sugar to this developer. This was a method capable of giving a negative of pure silver in pure gelatine also. The oxidised sugar referred to was used in several of the

specimens shown, and it was pointed out that ordinary sugar would have no effect whatever; but, like all other chemical products, if oxidation were started in it, the action would be carried on; so, by oxidising one portion of the sugar, it receives the power of absorbing oxygen, and in this way prevents the formation of the blisters. It could be prepared by boiling loaf sugar in solution with nitric acid. The use of hydrazine as a developer was dealt with, and it was described as capable of giving results on the slowest plates equal to those given by pyro on the fastest.

The CHAIRMAN agreed that the results appeared very promising, but he questioned very much their printing qualities. Notwithstanding all that had been said, he still thought that a negative of stain alone, if it could be realised, would be preferable as far as printing was concerned. He did not know that photography was specially allied with pure silver and gelatine, and, although some may say that stained gelatine hides bad photography, for his own part he gave the preference to the method which would give the best possible printing power, which was not the quality of the "perfect negative."

Mr. WELFORD saw no inducement in getting a negative which would not give the result he wanted. Granted that the absolute end in photography was the print, there could be no question as between stained and black-and-white negatives, nor any comparison of the two.

Mr. HENDERSON considered the "perfect negative" was good enough for anything, and moreover, as he had often remarked, the yellow-stained negative was fugitive.

Mr. BECKETT was struck by the cleanness of the results, which were positives, and would welcome the introduction of a developer which yielded such images.

Mr. HADDON understood that the necessity for the stain was more or less to fill up the interstices amongst the grains of silver; but, if one started with the silver bromide, as in a slow plate in a finely divided state, there would be no need for filling up in this way, on account of the power of equalling with the slowest plates the results by the fastest developed with pyro, by using the hydrazine mentioned by Mr. Banks.

Mr. BANKS replied, and was accorded a hearty vote of thanks.

PHOTOGRAPHIC CLUB.

SEPTEMBER 29,—Mr. H. Harvey George in the chair, to whom the members accorded a hearty welcome.

It was the first Travellers' Night of the season, and the Lantern Committee set the ball rolling by two of their members giving a lecture upon an unconventional trip up the Thames. Messrs. Stretton and Welford went from Putney to Hurley and back, sleeping and living on board their boat, and bringing back with them something like 100 views, the majority of which were not the commercial representations of the river. The lecture was delivered by Mr. WELFORD in his usual humorous way, whilst Mr. Stretton presided at the lantern, with the other Committeeman, Mr. Williams, assisting. The idea was to float, sail, be towed, get out and walk, or lie down and sleep—in fact, to do anything but hard work; to visit the backwaters and ditches, the nooks and corners, and generally to take it easy and to take photographs. Judging from the views shown and the humour of the lecture, there was little doubt in the minds of the members present as to the adherence to the formula laid down. The trip can best be summed up with Mr. Welford's conclusion: "If you want a thorough change, a restful holiday, a change from twice two and carry one to the next column to find one's self 1s. 11½*d.* out in the total, a change from 'I am in due receipt of yours,' and from 'Gone to the post, back in five minutes, wait,' take a trip up the Thames, use a boat in which to sleep and eat, do your own washing up (or get Stretton to go with you), do not make up your mind to get anywhere in particular, and, having got there, be in no hurry to leave. Tramp the Thames, find the pretty bits, and don't cover forty miles each day. Try two miles for the first day, and see how the thing pans out. If that's too much, go one mile the next. Keep away from the rowing man. One man laughed at me, and said our day's journey was about two hours' rowing only, and he did not call ours rowing at all. No, I replied, we didn't want rowing, we wanted pleasure. Pawn your watch before you go, keep your temper, and take plenty of time and tobacco. Then you'll return in good health, good spirits, and good temper; so well, in fact, that the very first thing you'll do is to ask the wife if it's a new cloak or a new bonnet she would like best." Mr. Welford technically added that they used isochromatic plates, but without a screen throughout, and the slides were made upon Gem lantern plates, which for simplicity and beauty of result proved themselves worthy of their name. All exposures were made with the camera in the hands only, and the majority were taken from the boat itself.

Mr. STRETTON, replying to the vote of thanks, said the inception of the idea was due to him, as he had long held the notion that the only true and proper way to see the Thames was to tramp it. Steam launches and day trips were of no use; it was necessary to be in a boat and on the river very early in the morning and late in the evening. Mr. Welford in the lecture had made many humorous tilts at himself (Mr. Stretton); but, nevertheless, it was a thoroughly enjoyable trip, and for a holiday of restful change he said, "Tramp the Thames."

Aintree Photographic Society.—September 28.—Mr. D. Travis gave his demonstration on enlarging. The method shown was that of the usual enlarging camera, with magnesium ribbon as an illuminant, with which Mr. Travis enlarged a half-plate negative of an interior to 12×10 on bromide paper, and subsequently a landscape negative of similar size on Nikko paper of like dimensions. At the conclusion of the demonstration, Mr. HARRIS explained the system followed when using an enlarging lantern.

Lancaster Photographic Society.—September 28.—Mr. SCOTT, representative of the Thornton-Pickard Manufacturing Company, gave a lecture on the shutters, cameras, &c., made by that firm, illustrated by about sixty lantern slides.

Liverpool Amateur Photographic Association.—The first meeting of the winter session was held in the Club-rooms, Eberle-street, on Thursday evening, September 30, the President (Dr. J. W. Ellis) in the chair.—Messrs. A. H. Knight, Samuel Moss, Frank Adams, David A. Bingham, A. G. Mullinor, and Frank Reynolds were elected members. After the formal business had been disposed of, and a touching reference had been made by the PRESIDENT and Mr. LANGE to the loss sustained by the Association through the death of the late Mr. William Tomkinson, Dr. ELLIS vacated the chair in favour of Mr. J. S. Brown, and delivered his lecture entitled

PERSONAL AND PHOTOGRAPHIC IMPRESSIONS OF NORTHERN BRITTANY.

The lecture was illustrated by about 120 lantern slides, and the places visited included St. Malo, Dinan, Lamballe, Guingamp, Treguier, Lannion, Morlaix, and others. The most interesting pictures were certainly architectural subjects, and out of a splendid lot those deserving of special mention were perhaps outside and interior views of Dinan Church, a greengrocer's shop at Lamballe, south door of church at Guingamp, and the church of Le Folgoet, near Landernau.

FORTHCOMING EXHIBITIONS.

1897.		
October 8–13	Glasgow International.	W. Goodwin, 3, Lynedoch-street, Glasgow.
,, 8–Nov.	Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 8–Nov. 13...	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
November 1–6.....	Brixton and Clapham Camera Club.	C. F. Archer, 1, Gauden-road, Clapham, S.W.
,, 16–18	Hackney Photographic Society.	W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.
,, 22–27	Ashton-under-Lyne Photographic Society.	The Secretary, Town Hall, Ashton-under-Lyne.
December 9–11	Aintree Photographic Society.	
1898.		
January 17–22.....	Blairgowrie International.	Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
January–February...	Photographic Society of India.	Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30	National Photographic and Allied Trades Exhibition.	A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14	International Photographic Exhibition (Crystal Palace),	R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Patent News.

THE following applications for Patents were made between September 22 and September 29, 1897:—

ANIMATED PHOTOGRAPHY.—No. 21,516. "Improvements in the Mode and Means or Apparatus connected with the Cinematograph or other Apparatus for Showing Animated Pictures, Photographs, or other Pictures." M. STERN.

GLAZING PHOTOGRAPHS.—No. 21,543. "Improvements in Devices for Glazing Photographs." E. CHAPPUIS.

TONING.—No. 21,679. "Improvements in Method of and Apparatus for Toning Photographs." Communicated by A. Schwarz. Complete specification. G. A. DE KATOW.

LANTERN JETS.—No. 21,685. "Improvements in Jets for Optical Lanterns." L. A. FRANKS.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PLATE BACKING: MATT VARNISH.

To the EDITORS.

GENTLEMEN,—Much is being written and said on this subject just now; and, while there seems considerable diversity of opinion as to the most suitable backing and its application, no doubt exists as to the necessity of a backing of some sort. In India it is probably more of a necessity than in England for outdoor work, and yet, of the numerous amateurs I have met and worked for, I have not found one who backs his plates. I am constantly advocating the practice, and show examples of its utility, and none seem disposed to question its desirability or its power of improving the results. But—and the "but" in this connexion seems quite big enough to effectually prevent them availing themselves of the advantages of backing—they are unanimous in voting it "too much trouble," and, when one comes to consider the limited facilities for work possessed by the amateur as a rule, one cannot wonder at this. In

many cases his time is limited too, and he does not think the advantages of backing compensate for a few hours spent in drying backed plates, for where there are no special light-tight drying cupboards available, or some other arrangement where the plates can be left to dry in safety without attention (an advantage rarely possessed by amateurs). Once he is in his "dark cupboard"—it cannot often be called a room—he has to stop and fan his plates dry and put them in the slides before he can leave it; not an inviting prospect, any how. Backed plates, then, will not be generally used until plates of all makes can be got ready-backed, or an effective, quick-drying, easily applied backing is on the market and available everywhere.

For myself, I have tried various kinds of backing, but have not had an opportunity of trying any of the ready-backed plates, as they are not to be purchased in India. I have given up the use of all backings except that of lamp-black dissolved in spirits of wine, and to which has been added sufficient shellac varnish to prevent its peeling off. I find it effective, while it dries in a few seconds after application. In fact, in the hot dry season it dries before one can properly spread it, so I pour it on to the back of the plate, lead it round with a brush, and drain off the surplus into the bottle. I have carried slides filled with plates so backed for many miles in jolting carts, and have not had any trouble with pinholes from the backing powdering or coming off.

For some years I have made my own matt varnish by dissolving ordinary orange shellac in methylated spirits, clearing with chalk, filtering, and then adding a suitable quantity of bichromate of potash. This is, so far as I am concerned, an entirely original method, and I never saw it mentioned anywhere up to the date of writing. By varying the strength of the shellac solution and the quantity of bichromate, any degree of opacity may be got in the film. When flowed on to the back of a negative, drained off, and fanned dry, it sets with a delightful matt surface. It can be scraped off with the fingers, or a knife, bit of wood, &c., like scraping new cheese, while it takes pencil as well as paper does. Any amount of modification in a negative is possible by use of the knife and pencil, while it would lend itself admirably to making rapidly executed diagrammatic lantern slides. After a few days the film, however, becomes quite hard, so plates must be freshly coated to be worked upon easily with a scraper. The other day I conceived the idea of adding dragon's blood to this varnish and using it as a backing, and I found it answered extremely well, but I have not had time yet to make comparative tests. In conclusion, I may say that some of this matt varnish that I made a year ago, and which was left unused upon a shelf at my summer residence while I was away at my home on the plains, had become a jelly-like mass when I came up at the beginning of the summer. I do not think this is explained by the possibility of the evaporation of the solvent, for the bulk is apparently the same. It is quite certain that the difference in bulk is so small as to be inappreciable to the eye, while the bottle was securely corked. I presume it is due to the action of the bichromate upon the shellac.—I am, yours, &c., H. HANDS.

Pachmarchi, Central Provinces, E.I., September 5, 1897.

N.B.—I have just received my copy of THE BRITISH JOURNAL OF PHOTOGRAPHY, August 20 issue, and see it is simply crammed with communications on backing plates, some of which should be useful to Indian workers. I ought to have mentioned that, to clear off the lamp-black backing, I moistened a rag in a weak solution of soda carbonate. It then comes off as easily, or easier, than it was put on. H. H.

CUTTING AND TURNING GLASS.

To the EDITORS.

GENTLEMEN,—Though the following dodge is not new, it may be of some use to the junior members of the photographic craft.

Turpentine is a lubricant which will enable steel tools to cut, or rather abrade, glass smoothly without making splinters; a common hard drill will, with the assistance of a drop or two of turpentine, perforate glass almost as readily as if it were metal; and a file, with the same assistance, will readily remove any excrescences from the edge of a plate of glass. I have just been using a file to remove a projecting corner from a piece of ground glass which was prevented by it from entering into the recess made for it in my camera screen, and for this or some similar purpose it may be useful to know of this dodge.

Many years ago I had occasion to make some circular discs of coloured glass to fit recesses in an instrument; by cementing them on to a lathe chuck I was able to turn them down to the proper diameters with a file and turpentine in default of the proper arrangements.

Trusting this may come useful among your collection of receipts,—I am, yours, &c., J. F. T.

September 29, 1897.

THE BICHROMATED GUM PROCESS.

To the EDITORS.

GENTLEMEN,—I have just read Mr. Maskell's book on the process he calls photo-aquatint. It is a clear and practical description of a process that may have a considerable future before it, but what I wish to call attention to is the important statement made in the postscript, and I am surprised that no notice seems to have been taken of it by some of those who have studied the theory of carbon printing.

Mr. Maskell says, at page 54, "that an entirely new principle upon which to work suggests itself to us. It consists in sensitising the paper first, and then applying the gum and colour." Such a careful and conscientious worker as Mr. Maskell could not have made any mistake in the matter, yet it seems to me that it is a principle that must quite revolutionise the theory and practice of carbon printing. That a dry coating of bichromate should be able to sensitise a superposed coating of colloid and colour is strange enough; but, more curious still, Mr. Maskell has found paper so prepared *twice* as sensitive as that prepared by a mixture of the ordinary kind, notwithstanding that the light has to pass through a coat of opaque pigment before reaching the sensitised surface. My object in writing is to call the attention of scientific authorities on the carbon process to the fact, in the hopes that they may be able to give us an explanation of the curious phenomenon.—I am, yours, &c.,

Morristown, Lattin, Naas, October 1, 1897. GEORGE MANSFIELD.

THE INTRODUCTION OF GELATINO-CHLORIDE P.O.P.

To the EDITORS.

GENTLEMEN,—In your issue for September 24, you reproduce an excellent article from the *Photographische Correspondez*, signed by E. Valenta, which says: "Gelatino-chloride paper for printing-out was first prepared by Obernetter, of Munich, in 1886, and, later, by Stolze, of Berlin, and Liesegang, of Düsseldorf."

Now, as a statement in two influential journals like the *Photographische Correspondenz* and THE BRITISH JOURNAL OF PHOTOGRAPHY, signed by an authority like E. Valenta, would be accepted as correct, it is desirable in the interests of historical accuracy to correct this misstatement, as the first gelatino-chloride prints were made by myself some years previous to 1886, and the first gelatino-chloride prints exhibited in public were shown by myself at the London and Provincial Photographic Association in February, 1885, full particulars being given in an article by myself in THE BRITISH JOURNAL OF PHOTOGRAPHY for March 6, 1885, and two weeks after this (March 20, 1885) Mr. Satchfield advertised gelatino-chloride printing-out paper for sale commercially in the BRITISH JOURNAL OF PHOTOGRAPHY, and was followed by several others from time to time, but it was not until the Ilford Company took the matter in hand, and produced their P.O.P. in 1891, that commercial success may be said to have been achieved.—I am, yours, &c., J. BARKER.

Tonbridge, October 4, 1897.

DECORATION AT THE SALON.

To the EDITORS.

GENTLEMEN,—"Finally, an endeavour has this year been made to show that the colour and character of the wall upon which the picture hangs are quite as important factors in its framing as the mount or moulding which immediately surround it, and that a monotonous regularity in the arrangement of an Exhibition is in no way a necessity."

The above "forewords" from the Salon catalogue indicate the spirit of advancement in art which is said to be characteristic of the leaders of the Linked Ring, and I would like to call the attention of the ancient and effete Royal Photographic Society to the progress which the Dudley Gallery will undoubtedly show in wall decoration and furnishing when the authorities can get the British workman out of the Exhibition gallery. At present all the colour scheme is hidden by some coarse wrapping canvas, on parts of which, and even on one picture frame, some 'prentice has been scribbling with crayons. I know how much trouble it is to get the British workman away from an Exhibition in time for the opening, but am sorry that he has prevented the Salon Committee, on the earliest day of the show, from instructing the world in the art of hanging photographs. I hope to pay another visit, later on, when the scheme is on view, and would ask the Hanging Committee of the Royal Photographic Society to pay a visit also after the canvas is down, and follow out the spirit of the above "forewords" in their best sense.—I am, yours, &c., J. HART.

ROSE DES ALPES.

To the EDITORS.

GENTLEMEN,—On page 311 of your May 14, 1897, issue, in a footnote, Mr. A. D. Pretzl says rose des Alpes is generally known in England as *rose Bengal*.

On page 850 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897 rose des Alpes is given as *thio*dichlortetraiodo fluorescence (probably fluorescein was meant). On page 374 of Vogel's *Spectral Analyse*, rose Bengal is given as the potassium salt of tetraiododichlorfluorescein.

I send you herewith a small sample of Mucka rose bengal and of ros des Alpes obtained through the Anilin Company in Berlin.

Comparison of colour in powder and solution will show a difference. I also understand that rose des Alpes has been patented by H. Durand

& Co., the manufacturers, and this could hardly be if it was plain rose Bengal.—I am, yours, &c., MILTON B. PUNNETT.

Jennings, Mo., September 14, 1897.

P.S.—Of course, all this is based on the theory that rose Bengal in England is the same salt as in America and Germany.

THE PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—Kindly allow me, through the medium of your columns, to invite to the meetings of the Photographic Club any provincial photographers who may be in London for the Exhibitions. Our meetings are held at Anderton's Hotel, Fleet-street, every Wednesday evening, at eight. On Wednesday evening next, the 13th inst., slides from negatives taken during the recent Photographic Convention at Yarmouth will be shown, and we shall be very pleased to see any members of Convention who can make it convenient to be present.—I am, yours, &c., F. A. BRIDGE, *Hon. Secretary and Treasurer.*

East Lodge, Dalston-lane, London, N.E., October 2, 1897.

P.S.—The Convention slides will also be shown on Monday evening, October 18, at the Exhibition of the Royal Photographic Society.

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—If "Critic's" warning is based on carefully acquired information, he will have deserved, not only my thanks, but the thanks of all assistants, for I am sure that we have quite enough worries in photography without the additional one of not being sure of a fixed salary. I may say, however, that in twenty-three years' experience in various parts of the country I have been uniformly well treated by my employers, so that I do not think that employers generally deserve the strictures which have been passed upon them, nor do I think that photographic assistants, as a whole, have any great reason to grumble; but, of course, I may be one of the lucky ones.—I am, yours, &c., GRATEFUL.

A NARROW ESCAPE FROM FIRE.

To the EDITORS.

GENTLEMEN,—I doubt if you have ever heard of an accident exactly like the one I am about to describe.

It came about in the following manner. We make our own enlargements on our own premises, in a room with a window facing north, the window being fitted with a bellows camera inside, and with apertures for receiving negatives of different sizes in the usual way outside of negative. I have a nine-inch condenser fitted and removable, and outside the condenser a piece of ground glass, also removable. In addition to the above I also use an ordinary plate-glass mirror fixed on a stand facing the south, about six feet away from the window, movable, the object of which is to reflect the direct rays of the sun on to the ground glass in the window, to give a strong light in the enlarging room, in order to see to focus more easily and accurately, also for enlarging very dense negatives. On the above date I had made some enlargements from a 12 × 10 negative, and had removed the condenser. When I had finished, I told my assistant to put back all the apparatus, which he was doing, and, as he went to put the condenser in its place, he found he could not do so without going into the enlarging room and removing the 12 × 10 negative, so he rigged up the condenser by the side of the window whilst he went inside to remove the negative. When he came out, he was surprised to see smoke and finding the condenser had burnt a hole in the bellows, the condenser being in such a position that it was impossible for any direct rays of sun to fall on it, but only the reflected light from the mirror above mentioned. We put out the fire without the assistance of the fire brigade, and I am communicating the facts to you, as the accident is altogether new to me to happen in this way. Of course, I am quite aware that such accidents happen sometimes by the direct action of the sun, but I was not aware of its happening in the way above mentioned.—I am, yours, &c., J. BELL.

Catherine-street, Frome, September 28, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

ALPHA.—The nitrate must be used.

KEEPING QUALITIES OF PLATES.—H. HANDS. Thanks for your interesting communication on this subject.

FOREIGN COPYGHT.—J. HORSBURGH & SON. The only book we know of is one in French, published by Messrs. Gauthier-Villars & Fils, Quai des Augustins, Paris. This might suit your purpose.

COLOURING ALBUMEN PRINTS.—MINNIE. Wash the prints over with very dilute oxgall; you will then have no difficulty in getting the colour to lie evenly. Prepared oxgall, suitable for the purpose is sold by all artists' colourmen.

FUSIBLE METAL.—RELIEF. By melting together five parts of bismuth, three parts of lead, and two of tin you will obtain a very fusible metal, with which casts from gelatine reliefs may be obtained. An alloy such as this melts at a temperature about the same as that of boiling water, or less.

TONING.—A. L. (Putney). We strongly suspect that your difficulty in obtaining deep purple tones is not due either to the paper or the toning bath, but to the negatives you are using. To obtain these tones, a vigorous negative—one with a long range of tones from the high lights to the shadows—is imperative. With such a negative there will be no trouble with almost any paper or any toning bath.

PATENT.—PATENTEE. If your patent is being infringed, you can certainly get an injunction to restrain the infringement, and also recover damages, &c., that is, of course, assuming that your patent is a valid one. It is not to be taken for granted that, because you have obtained a patent, it necessarily is a valid one if tested in the Chancery Court. Patents are granted to every applicant unless they are opposed by some one interested. The Patent Office takes no trouble in the matter. We should recommend you to consult a patent agent of standing, and act on his advice.

TRIMMING PRINTS.—T. STEPHENS writes as follows: "Can you tell me how to trim prints neatly? I find, if I cut them with the scissors, I cannot get the paper to keep in contact with the glass shape, and, when I use a knife, I get the edges, especially at the corners, jagged and rough. Is there any better method?"—We should recommend our correspondent to try a wheel trimmer, which is sold by all photographic dealers. We may add, however, that clean edges can be cut with both a knife and with scissors, though the latter are not so well suited for large prints as small ones.

FIXING PRINTS.—G. CARTER says: "Would you kindly inform me how many cabinet albumen prints one pound of hypo will fix? I have never seen it stated. Also if it is correct to fix two batches of prints in one bath if it is strengthened for the second batch?"—It is much better to use fresh hypo for each batch of prints than to strengthen up an old solution. No one, we think, has calculated out how many prints can be *safely* fixed in practice with a minimum weight of hyposulphite of soda. This substance is now so cheap that one can afford to use an excess. See leader in our issue of September 3.

MOUNTING.—E. PENFOLD writes: "Can you tell me what material I can use to put over P.O.P. prints for rubbing down when mounting that will not adhere to them? I have tried oil sheets and very fine linen. It is all right when the mounts are enamelled; but, when it's a Bristol mount, it draws the print away from the mount very much. I have also tried pressing in contact with a sponge, but that is not completely satisfactory. Any hints will greatly oblige."—We should say that a more adhesive mountant than that apparently used would get over the difficulty—that is, one that is more sticky when first applied; gelatine, for example.

FADED PRINT.—H. J. BLISS asks: "Will you kindly give me your opinion as to cause of enclosed print fading? It was made about six years back, and had a voyage to India and back home; sensitised or Blackfriars paper was used; acetate toning and ordinary hypo bath used. I have not had similar complaints about any other print."—The print has faded badly, but it is impossible to say definitely why from the data given. It would seem, however, that too little care must have been bestowed upon its production, and the effect of time and its voyage to India and back has sorely tried it. India is a trying climate to photographs unless they are kept perfectly dry.

STAINS ON MOUNTED PRINTS.—T. HANDS writes: "Will you kindly let me know, through your Inquirer column, the cause of enclosed prints marking. They are mounted with stickphast, and, I believe, oil of cloves is used in it, so it will keep. My customer says the mounts cause it, but I am of a different opinion."—We do not know the composition of the paste named, but oil of cloves would not cause the mark even if it contained it. If the mount be rubbed with a wet handkerchief, particularly near the cut edges, it will be discoloured, showing that the colouring on the mounts is, to an extent, soluble in water, and consequently in the mountant used. That, no doubt, is the cause of the markings.

EXHIBITIONS.—COUNTRY PHOTOGRAPHER says: "Will you please tell me how long the Exhibition of the Royal Photographic Society will remain open? I am going up to town this week, and as I have not been for many years, and do not well know my way about, should be glad if you can tell me what exhibitions—photographic—are now open, and what portrait galleries are best worth seeing—I mean best in the sense of being useful to a country photographer."—In reply: The Royal Photographic Society's Exhibition is open daily till November 13. The Photographic Salon (Dudley Gallery, Piccadilly) is also open for the next few weeks. The National Portrait Gallery, the National Gallery, and the Tate Gallery, should give you plenty of material for study.

*** Several answers to correspondents unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1954. Vol. XLIV.—OCTOBER 15, 1897.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

The thirty-seventh issue of The British Journal Photographic Almanac will be published on December 1 next. It is in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co-operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the Almanac. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us lists of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the Almanac is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us as early as possible.

The Publishers wish us to remind Advertisers that many of the advertisement pages of the Almanac are already booked, and that, to insure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

An interesting case, illustrative of the occasional difficulty experienced by photographers in obtaining the proper chemicals for photographic purposes from chemists who profess to supply them has recently been brought to our notice. It appears that a firm of photographers ordered a cask of hypo from a local chemist. The supposed "fixative" was put into use, and eighty-six prints were treated with the solution. In a few days thirty of the prints were returned stained and darkened. An examination of the "hyposulphite" revealed the fact that it was not hypo at all, but Glauber's salt, otherwise known as sulphate of soda, which is not a solvent of the silver haloids. The photographers, who are trade printers, have been unable to trace most of the prints they have sent out, and it is obvious that they are likely to sustain considerable injury in their business. The chemist refuses to accept liability for the mistake, a position also taken up by the wholesale house. We understand that matters have reached the stage of legal proceedings. Presumably an action for damages would lie in such a case.

* * *

Our quotation, on September 24, from the letter of a provincial photographer, who is in the happy position of having plenty of business, has brought us the following rejoinder from a photographer of world-wide reputation: "May I suggest that you should send some one to interview the photographer you mention, in the Journal of September 24, who has so much work to do. All of us who have nothing to do—to-day I have not had a single sitter, and my till-sheet on the *receipts* side is quite blank—would like to know the reason why that man is busy while we stand idle." We think we could give the essential deduction from the interview which our second

correspondent suggests. It is that the busy photographer is a good man of business. A little business ability atones for a multitude of photographic sins.

* * *

We have received from the Technical Education Board of the London County Council the report for 1896-97 of the Bolt-court Technical School. This, we may note in passing, is printed by the students of the St. Bride's Foundation Institute. The report states that "day classes for the photo process department of the school were started in April last; this was intended as an experiment, which, if successful, will be extended to other sections of the school. Up to the present these classes have steadily progressed, and, no doubt, as the arrangement becomes more widely known, the progress will be more marked. Several heads of firms have expressed their approval of the idea, and have promised to send their apprentices."

* * *

Included in the volume are the reports of the Art Director; the teacher of design; the teacher of drawing for process, who observes that the class, though not large, contains talent of considerable promise, and proofs of excellent work done, which may be seen in the school, and that will convince connoisseurs that the Bolt-court art students can hold their own in this department; the teachers of lithographic drawing, tricolour work, and process work. The number of individual students who joined the evening classes in process work was 101, the total entries in the various branches being 189. Mr. Gamble's report of this branch is very satisfactory. Equally satisfactory are the reports relating to line etching, tone etching on zinc and copper, and collotype.

* * *

The report, which is illustrated by a number of phototypic pictures of very great excellence, is a capital tribute to the thoroughly capable manner in which the Bolt-court Technical School is managed. The school is open to young men desirous of acquiring a practical knowledge of any branch of process work for commercial purposes, and the encouraging nature of the report before us justifies us in strongly recommending the school to those who are interested in the progress and development of this important department of photographic industry. One and all connected with the school are to be congratulated on the results of their labours, and especially the Technical Education Board of the London County Council, under whose auspices the school is conducted.

* * *

The Explosives Department of the Home Office has, it is announced, recently had under consideration the question of the restrictions to be applied to the manufacture and keeping of acetylene gas, and has conducted various experiments with the object of gaining information on this matter. The results show conclusively that acetylene gas, *per se*, when under a pressure of something less than two atmospheres, is violently explosive; whereas, at a pressure less than one and a half atmospheres it appears to be reasonably free from liability to explosion, provided it is not admixed with oxygen or atmospheric air. For commercial and practical purposes it is considered sufficient to allow a pressure of twenty inches of water above that of the atmosphere (*i.e.*, roughly, about one and one twentieth atmospheres), and it is accordingly proposed to draw the safety line at this point, and to declare acetylene, when subject to a higher pressure, to be an "explosive" within the meaning of the Explosives Act, 1875. In France and Germany the authorities have fixed the limit of danger at one and a half and one and one-tenth atmospheres respectively, and have imposed prohibitions or restrictions on the keeping or manufacture of the gas when it is at a higher pressure.

* * *

In addition to the display of lantern slides from negatives taken during the recent Convention, to be given at the Royal Photographic Society's Exhibition on Monday evening next, the 18th inst., Mr. E. P. Prestwich has kindly promised to show some animated photographs by means of his "moto-photoscope," including "members of the Convention leaving the Town Hall after the taking of the official group." This picture was taken, midday, on Wednesday, July 14, and exhibited on the screen at Yarmouth Town Hall the following evening.

THE TWO EXHIBITIONS VIEWED FROM A COMMERCIAL STANDPOINT.

The Exhibitions of the Royal Photographic Society and the Salon have been open to the public for about a fortnight, and, during that period, they have been pretty freely criticised alike by the photographic and by the lay Press—and varied, indeed are the comments passed upon them. What some admire, and think should be emulated, others, on the contrary, think should only serve as object-lessons as to what should be avoided. Professional photographers as a rule usually look upon the Annual Exhibition of the Royal as being representative of the existing state of photography in all its phases, and many in the provinces make a special visit to London in order to put themselves *au courant* with the latest developments of the art. Will they find what they—or the great majority of them—are most interested in, namely, the commercial side of photography, represented at the Royal, or the other show? At the Salon they, of course, would hardly expect it. But in the former they have hitherto done so, or at least up to the last year or two.

We have already heard complaints of this year's Exhibition, as we did of last, from provincials, that commercial photography seems to be quite ignored. They say that most of the pictures at the Royal show a marked improvement on those of a few years back as regards their purely artistic character, but they show no improvement in their technical qualities as photographs; in fact, according to the ideas of several, there is a marked retrogression. There are very many photographers who still consider that a photograph is not a good one unless it is technically good as a photograph—that is to say, is sharp and possesses a wide range of tones from the highest lights to the deepest shadows, as one sees in a good line, or mezzotint, engraving. It must be admitted that this is not the prevailing characteristic of the larger proportion of the works in the two exhibitions—those on view are for the most part of quite the opposite type, though they serve to illustrate the possibilities—in many instances, the impossibilities—of photography, and either way they are highly instructive.

Many professionals who visit the Royal expect to find examples of the best every-day photography as it is generally worked throughout the kingdom. But this they do not find in either show. Every professional photographer knows quite

well that the great majority of the sitters for whom he caters expect to have their portraits perfectly sharp, and that they will not have them unless they are; also that they expect them to be of a bold and vigorous type, such as they have hitherto had, and that they will accept no other. If he were to offer portraits to his *clientèle* such as many that are, rightly, praised at the Royal, they would, in nine cases out of ten, be rejected. It would, we fear, be useless for him to argue that these unsharp, low-toned pictures are more artistic than those of the older type; indeed, it would be unwise, from a business point of view, for him to do so. If he were to exhibit such pictures in his shop window or show-cases, they would, we suspect, not tend much to the enhancement of his business, simply because the general public, on whom he has to rely, is not yet educated up to them, and we suspect he would not find it remunerative to attempt its education up to that standard at present. By the way, we know that a year or two back some portraitists essayed pictures of the out-of-focus and low-toned type, and it would be interesting to learn from them the commercial success they met with.

What has been said with reference to portraiture applies equally to landscapes. Would the general public purchase them if they were of the character of so many that are shown at Pall Mall and at Piccadilly? If sharp pictures are not still in demand, why the large sale of the many new forms of lenses to enable professionals and amateurs to obtain them?

What many provincial photographers who journey to London at this season expect to see at the Exhibition of the Royal Photographic Society, which is so largely composed of professional photographers, are, amongst other things, examples of what the general run of the public most desire, namely, sharp, vigorous, and technically good photographs. There is no reason whatever why a photograph possessing these qualities should not be an artistic picture. That, of course, is simply dependent upon the artistic ability—in lighting and posing in the case of portraiture, and the selection of site and light in the case of landscapes—of the one who produces it. But this class of work is not well represented in this, nor was it in last, year's Exhibition. Those who wish to see it, so far as London is concerned, will have to seek it in the reception rooms, shop windows, and show-cases in the neighbourhood of Regent-street, Bond-street, and Baker-street, Piccadilly, and suchlike thoroughfares.

It may be thought that this article is penned in a philistinic spirit, but it is not; it is merely the echo of the opinions expressed by several professional photographers with whom we have conversed since the two Exhibitions have been open. It may, as some think, be a question whether the Royal has not, through its Selection Committee, the last year or two, ignored the professional or commercial element of photography a little too much.

Economical Funnel-holder.—An ingenious extemporised funnel, or burette-holder, is described and pictured in a recent number of *La Nature* as having been seen in use in the Lyons *Faculté de Médecine*. It is made of two American clothes pegs, one of them is made to pinch the side of a large strong glass jar, that end of the peg upon which the pinching action of thumb and finger is applied being placed uppermost. To this is attached, at right angles, by its own inherent pinching capacity, another peg, the hand-pinching portion being sprung on to the projecting portion of the first peg. It is then ready for use, the funnel, tube, or other object, being placed in the groove made primarily for the clothes line.

Photographing the X-ray Fluorescent Image.—Full details of M. Chas. Porchier's method of photographing the image given on the screen by the Röntgen rays, instead of the usual method, are given in a recent number of *Comptes Rendus*. To oppose an absolute barrier to the rays, and so prevent their acting on their own account on the plate through the walls of camera and slide, he makes the following arrangements. The dark-room door is perforated with an aperture, and in it the lens is placed. Besides placing behind the door a sheet of lead one metre across, he nails a sheet of lead three millimetres thick all around the lens. Thus a lead barrier, the metal screen, and the glass of the lens protect the film absolutely against the action of the rays. There is then only the fluoroscope image to act upon the plate. The fluorescent tablet upon which it is thrown is placed ·57 metres in front of the lens, and the focus of the Crookes tube is only three centimetres behind it.

The Sensitiveness of the Retina to Light.—Every one knows how, when a negative during development is raised to the gaslight to judge of its density, the eye will often become apparently fatigued or strained, and unable to judge of its characteristics. In a paper presented to the Royal Society, Captain Abney gives the result of his examination of this effect, and has formulated a rule showing its direction and extent. He finds that, "the smaller the spot of illuminated surface, the less reduction of the intensity of the light is required, and that the amount of reduction of the light falling on the spot, which just produces no sensation of light, is expressed by a simple formula, $I = x^m$, I being the intensity, and x the diameter of the spot." From this will be seen the usefulness of that plan of negative judging, in which the negative is placed behind an opaque screen perforated with a small aperture, instead of being held up before the light and examined as a whole, rather than piecemeal, as it were.

Argentaurum.—Whatever may be the ultimate outcome of the process of the alleged conversion of silver into gold, the results, as at present published, are startling enough. We have already put our readers in possession of the broad outlines of the process, and quoted the alleged results, as passed through the hands of the New York Mint officers, and we now append the latest achievements of the work of three months and a portion of a month. We are accustomed to read in the daily papers the monthly output of the Australian and the South African mines, but it never entered into the most imaginative of the average readers' minds that the time was at hand when the output by the aid of what might be termed the modern philosopher's stone process would be published in a similar manner; but this has been done, and here are the figures, as sent by Dr. Emmens to Sir William Crookes:—

Date of Deposit of the Ingots.	Weight.	Percentage of Gold.	Value in Dollars.
April 13, 1897	7·06	260	95·63
„ 23, „	9 64	326	120 01
May 7, „	11 00	275	147·61
„ 22, „	12·12	233	171·48
June 12, „	16·64	340	200·21
July 6, „	16·08	..	220·00
			955 03

The total production so far is, according to *La Nature*, 4·598 kilogrammes, with a net profit amounting to 2700 francs, or about 108*l*.

JOTTINGS.

What is a High Art Photographer? I never heard of such a person before October 1, on which date Mr. Paul Coe, of Gloucester, who styles himself a "High Art Photographer," had a letter in these columns taking me to task for calling the Salon a dustbin, and

offering me half a guinea to stay away from the Dudley Gallery and not refer to it directly or by inference. Evidently the profession of high art photography—whatever that may be—does not prevent a man from indulging in the most luxurious habits of generosity. I congratulate Mr. Maskell and the General Committee of the Salon on their champion, and hope he will receive the obvious reward of his valour and chivalry. This, of course, would be election to membership of the Salon, one of the qualifications for which may possibly be that you should be a High Art Photographer. If that be so, then we have a clue as to what high art photography really is.

Even more amusing than the Salon Exhibition itself, with its coarse canvas, its finnicking stencilling, its cheap vases and job line of brown calico, its jerry-built shelf, its excessively elaborated frames, and its photographic imitation of sepia and charcoal work, is the literature that it has provoked. One writer says that, with one or two (!) insignificant exceptions (*sic*), all those whose opinions are of weight are satisfied with the general effect of the Exhibition. "All those whose opinions are of weight" are presumably the Salon Hanging Committee, of which the writer is, doubtless, a member? I wonder whether the *Times*' review of the Salon is supposed to have any "weight?" Again: A well-known painter-etcher has been turned on to write up the Exhibition; but, alas! the result of the experiment is merely faint praise writ large. And then we are plaintively told that some wicked writers will poke fun and ridicule at the contents of the Dudley Gallery, precisely as they did four years ago at the very work which they now extol, and with which they have helped to cover the walls of the Royal Photographic Society's Exhibition! How very naughty of them, to be sure! Yet it is news to me that the "very work" which was hanging in the Salon Exhibition four years ago is now to be seen at Pall Mall! Is it?

But the unkindest cuts of all come from the great daily organs of that non-photographic public to which the Salon appeals. Read this: "At the Salon the photographer likes to play the artist, to write 'Forwords,' which he is pleased to think revolutionary, and to decorate his walls remotely after the manner certain artists have brought into vogue, all of which amuses him and does no harm. . . . . For the rest, there are the photographs made to look like anything but photographs, the suggestions for pictures and postures which show just where photography cannot be of use to art, and the nudes that would not be permitted anywhere but in a 'Photographic Salon.'"

The above extract is typical of many that have come under my notice. I don't quote it for the vulgar purpose of "crowing" over my Salon friends in their misfortunes, but because it gives me the opportunity of asking them fairly and squarely whether, after four years, they honestly consider they have made the slightest perceptible progress in converting the public to an appreciation of their "revolutionary" photographic aims. If what is printed in the non-photographic press by disinterested critics—I repeat in italics *disinterested critics*—be any guide, I unhesitatingly assert that the outside public won't have the Salon and its revolutionary aims at any price.

"Oh, but," I can imagine several of my Salonite friends saying, "the extract you quote is from the *Daily Chronicle*, and we know the writer. He always makes a point of going for the Salon." Very well. Here is another cutting, from one of the most discriminating and thoughtful articles on a photographic exhibition that I have seen in a daily newspaper, and I suppose I have read through hundreds of such productions in the London and country press. It is clearly the utterance of an experienced and qualified critic:—

"Great as is the ingenuity which the most skilled of them display, ingenious as are their efforts to escape from the iron barriers which encircle them, we cannot but feel that they are beating their wings against the bars in vain. When they do on occasion attain to results akin to those achieved by the genuine arts of interpretation, such as painting, drawing, and engraving, they but succeed in making us wish that, wholly shaking off their fetters, they should enjoy that perfect freedom without which the creative artist cannot exist. The best of these artistic photographs in which it is sought to control and interpret nature—by what mechanical means, and whether legitimate or not, it concerns the public less to know than it does the photographers—resemble either sepia drawings, mezzotints, or *fusains* (charcoal drawings). And, this being the case, would they not further gain were they frankly to be the things which they resemble?"

Rather cold comfort this for the authors of a "revolution" in photographic art at the end of four years' striving after the unattainable!

We now come to extract number three—three will suffice for my present purpose: "The enthusiastic photographer must not lose sight of the fact that at no time can the process of selection be entirely his own, and that the complete rejection of all but the acceptable elements of beauty of form, proportion, and tone is not in his power. Because of this, the range of photography, unlike that of painting or drawing, must always be a limitable one. The artistic photograph, therefore, must always be a compromise between Art and Nature—neither the one nor the other, and, except in exceptional cases, have ugly or unnecessary elements which the unmechanical process of selection employed in painting would have rejected. For this very reason it is only such an exceptional photograph (more probably than not produced by accident) which can be expected to bear the test of time—of the constant association which is the test of a good painting or a good piece of music. But, though I grant the possibility of such a production as a perfect photograph, I have not yet met with one, and must believe that, generally speaking, the very best photographs are like popular songs—the novelty and merit immediately apparent soon wears itself out, and after a time only the mechanical mistakes and inadequacies remain."

The above three extracts, selected at random from very many, give my readers, at home and abroad, a very fair idea of the views entertained by the most important sections of the London press with regard to the Salon. On the same subject the purely art journals are contemptuously brief or wholly silent. I hope I may not be misunderstood in my motives for all this. It is my object to try and make the Salon people realise that educated opinion is dead against their pretensions that the "advanced" works shown at the Dudley Gallery are anything but more or less successful photographs, which, at the best, are only too obvious in their imitativeness. The Salon has all along been trying to force a sham on to the acceptance of the public, and the public won't have it. The public always has appreciated, and always will appreciate, the honest photograph; but what the public plainly will not swallow is the photograph which is made to appear something which it is not—viz., the hand work of the trained and inspired artist, free from all "mechanical trammels." The Salon "Forewords" this year were avowedly written as a review of "the general position," from the Salon point of view. The general position from the public point of view could not be better summed up than it has been in the second of the above-quoted extracts.

A word now of a more personal kind. Ever since its establishment I have been an opponent of the Salon. But I have had no axe to grind, no private purpose to serve, by my opposition. The Salon as an institution did not step into a vacancy; it filled no gap; it has always been a misfit among photographic institutions. Still, it became established, by hook and by crook, and therefore the recognition that is always conceded to the accomplished fact was its due. It is claimed that the influence of the Salon has reacted to the advantage of pictorial photography generally. Granting so much, I should like to point out that pictorial photography doesn't date its birth from the time when half a dozen gentlemen had a difference with the Photographic Society of Great Britain, and, in consequence, set up a rival exhibition. If the Salon had never existed, and its

ounders had thrown up photography altogether, the probabilities re in favour of the assumption that this year's Exhibition of the Royal Photographic Society would have been every bit as good as, if ot better than, it is.

It is what I have thought the worse side of the Salon that I have always denounced. Where, now, are the formless blurs and mudges, the astigmatic abominations, the focal eccentricities that characterised its first three exhibitions? Forgotten and hidden out of sight. Does any sensible man believe that these things have had the smallest influence for good on photography, pictorial or otherwise? No one decries, and I am sure everybody admires, the work of such men as Crooke, Hinton, Robinson, Gale, Annan, Cameron, Hollyer, and others I could name. It is always honest, comprehensible, and beautiful photography. The dishonest, the obscure, and the unbeautiful are my pet aversions. The distinguishing characteristic of the Salon is its glorification of the sham and the imitative, the inscrutable and the ugly, and this year that characteristic, in my humble opinion, is more pronounced than ever, with a dash of the risky and map-like nude thrown in. The photographic poster, with its vile travesty of womanhood, has also thrust its hideous self forward. What is to come next? Is the camera going to be used for the "artistic" reproduction of the low features of the Parisian brasseries and cafés? Is the sacred name of "art" to afford an excuse for the photographic exploitation of all that is ugly and dismal in nature and in life? Is photography to be made the pretext for the exaltation of grotesqueness, eccentricity, and lunacy, unrestrained by genius? The reader has only to realise that these are some of the directions in which the Photographic Salon appears to be tending to understand the attitude I have occupied towards that institution during the last four years.

I am told that Mr. Snowden Ward shortly leaves for a brief stay in the United States, where he has undertaken to deliver a series of lectures, presumably on Shakespeare and Shakespearean lore. Mr. Snowden Ward's transparent honesty and manliness of character have won for him such general respect that I am sure he will carry with him the heartiest good wishes of the photographic world for a prosperous tour and a safe return. COSMOS.

FOREIGN NEWS AND NOTES.

A New Process of Colour Photography. — Herr von Ditmar has discovered a new process of producing coloured pictures, and some were recently shown at the Trierer Exhibition. They are positives on glass with a kind of coloured shimmer; red is the only colour which cannot be obtained. The discoverer does not claim that he has discovered any complete or practical process, but publishes the details in order that others may experiment. To prepare the plates, 350 parts of wood spirit, 30 parts of fuchsine, and 8 parts of thymol are intimately mixed and well boiled for a long time, and filtered hot three or four times. The mixture is coated, whilst hot, on the warmed glass, dried, and then heated till the film is no longer sticky. The plate has then a mirror-like surface, and will keep for a month.

It has to be exposed under a coloured transparency in the sun. Even after a few minutes a picture can be developed, but the best result is only obtained after some hours. Development is effected in cold water, which should be slightly acidified in order to set free the oxidising substances in the film. Development should be continued till all details are out, but not till all the colour has been washed out. The plate is then placed in a half per cent. solution of caustic potash till the black drawing begins to turn a gold colour. It is then dipped into eau-de-javelle or chlorine water, and then removed and exposed to the air till the image turns brown. This last operation may be repeated till the desired colours are obtained. The plate should then be washed with water and dried over a flame. The result depends to a great extent upon the duration of the action of the baths; every kind of fuchsine is not suitable, the best seems to be one that can be bleached with chlorine. Herr Precht, of Heidelberg, points out that fuchsine appears to be one of the substances which have been classed by Otto Wiener as capable of colour absorption under coloured images.

The Dansac-Chassagne Process. — Almost all the foreign papers seem to be agreed that this process is not quite what it was represented to be. A writer to the *Photographische Mittheilungen*, who has tried the process, states that it is the "plumpsten Schwindel" which he has come across, and that the sole purpose of the mother solution is to open the pores of the print, so that the three colours, which are aniline, can penetrate more easily. Any expert colourist can, with the ordinary albumen varnish colours, obtain better effects in a shorter time.

Chemical Blackening of Aluminium.—It is stated in *La Photographie Française* that aluminium may be blackened by being first thoroughly cleaned, and then coated with fresh egg albumen, and gently heated, and the temperature gradually raised. After some time, a deep black is obtained, which will withstand acids, and can only be removed by repolishing. The process has the advantage that the metal is not attacked.

Hypo in Metol Developers.—According to Dr. Eder, the addition of a small quantity of hypo to the metol developer gives great brilliancy and pluck to the negatives; it seems to act as a restrainer and prevent fog. The particular formula he suggests is:—

A.

Water	1000 parts.
Metol	15 „
Sodium sulphite	150 „

B.

Water	1000 parts.
Sodium carbonate	330 „
Hyposulphite of soda	1 part.

For studio work he suggests the use of 40 parts of A, 20 parts of B, and 20 parts of water; for landscapes, 20 parts of A, 10 parts of B, and 20 parts of water.

Colour, Brightness and Photometry. — J. B. Haycroft has pointed out that it is very easy to compare lights of the same colour in a photometer, but that, when different coloured lights are used, accuracy of reading is by no means so easy. The stronger impression which we receive from one source of light in comparison with another is really not dependent upon the different intensities of the lights, but rather on the physiological action which the colours exert. The brightnesses of different coloured lights were measured by him by determination of the small circle which could be recognised. When observed in a darkened room in which only the light of the spectrum passed through a narrow slit, the brightness of the colours—red, blue, yellow, and green—were as 1 : 3 : 6·7 : 10·9. In a brightly lit room with white walls the ratio was different, namely: blue, green, red, yellow, as 0·4 : 0·9 : 1 : 1·5. Further experiments with sectors showed that the eye is more sensitive to yellow than any other colours.

Toning Blue Prints.— According to Bolle, ferro-prussiate prints may be toned to a lilac colour by immersion in hot or cold solution of acetate of lead (the liquor plumbi subacetatis of the chemist), potassium sulphocyanide solution, thirty-five per cent.; with the addition of a few drops of acetate of lead solution a violet black colour is obtained. A four per cent. solution of potassium oxalate may be used for writing on such prints, and gives white letters, or, if the print has been drawn on with Indian ink, the blue image may be entirely bleached by this.

The Structure of Negatives.—R. E. Liesegang advances, in the *Photo. Archiv*, the theory that the silver image in the negative produces a relief in the film of gelatine like an undeveloped carbon print. This theory was confirmed by examination of sections of the swollen gelatine under the microscope. It was seen that the silver image laid sometimes on the surface of the gelatine, but when it was exposed from the glass side this was not the case, but the image penetrated the whole film, as in this case the image did not prevent the penetration of the developer. Another experiment was scraping away the image, and this showed that with short exposure the image only laid on the surface, as the light had not sufficient penetrative power. With normal exposure, the reduction in the exposed parts might penetrate right through to the glass. With strong over-exposure, it laid only on the surface. The character of the image changes in the lower films. With normal exposure

the lower portions have greater contrast than the upper, a fact which may be observed in intensification if it is interrupted before it has penetrated too deeply. Plates which have been thickly coated with a single emulsion behave just like Sandell plates if they are exposed through the glass. The above-stated theory will not explain all phenomena. Chemical processes are here neglected, and the structure of the image is not so simple as would appear from the above. With a well-exposed negative a positive will be seen when looked at from the back of the glass. By scraping the film a yellowish white deposit will be found, whilst the upper is black. When looked through, both are very similar. The white portion blackens in mercurial intensification and cannot be removed by hypo, and is therefore not silver bromide, but merely a modification of silver itself.

Orthochromatic Plates.—Dr. E. Vogel points out that, in order to make orthochromatic plates by bathing which will keep in summer, the quantity of ammonia usually used should be decreased. Either of the two following solutions may be used.

1.

Erythrosine solution (1 : 1000)	50	parts.
Distilled water	150	,,
Ammonia	1 – 2	,,

Or 2.

Erythrosine solution	50	parts.
Distilled water	300	,,
Solution silver-nitrate (1 : 1000)	50	,,
Ammonia	2	,,

Eder on the Dansac-Chassagne Process.—Dr. J. M. Eder, the Director of the K. K. Lehr. und Versuchsanstalt für Photographie, at Vienna, and one of our greatest authorities, has seen a demonstration of this process, and he states that it is nothing more than a colouring process without a trace of the selective absorption that was claimed for it; the process is simple because the three-colour idea has been adopted, but it is questionable whether it can be patented, and it certainly is not a photographic process of natural colours in which the colour of the object has any influence on the final result. He winds up with a rather caustic remark: "Damit ist die Chassagne'sche Affaire für mich erledigt und abgeschlossen."

Nauseagraphs.—Von der Waterkaut, of Hamburg, writing to the *Photographische Correspondenz* on the subject of the International Exhibition of Artistic Photographs at Hamburg, has a good (?) word to say for the fuzzy gum bichromate things with which we are not unacquainted in England. He is speaking of the bi or tricolour things of Henneberg, Kühn, and Watzek, and states that probably a poor half-blind man would see nature as it is here represented. In speaking of one of Henneberg's things he says: "here also one cannot decide whether the trees are poplar, cypress or Heaven knows what botanical specimens." Doubtless Herren Henneberg, Kühn, and Watzek will take this as a high compliment.

WEIGHTS AND MEASURES.*

It has been the custom for your President at this meeting of the year to deliver to the Society an address—usually on some subject of paramount interest. I have met with great difficulty, in that all that has occurred this year has already been thrashed out so well and so thoroughly, that all I could say would be mere repetition. Again I feel the difficulty of having to follow the steps of my illustrious predecessor, in that I have no fund of original research to fall back upon.

After much thought I determined to take as my theme to-night the subject of weights and measures as they are used in our craft, and what modification in our habits would best conduce to accuracy in result, facility of manipulation and computation, and, looking at it from the commercial point of view, increased volume of trade.

Doubtless, every one here present will have anticipated the words, "the metric system;" that is practically my aim and desire, and one that I have striven for since the years 1872–74, when I was a member of a Committee of the House of Commons on a Bill on this subject.

It may be well that I should say a word here on the origin of this system, which is usually referred to the Reign of Terror. In reality, the first action that was taken was a proclamation of the King, Louis XVI., recommending the subject to the consideration of the Assemblée Nationale in response to an address to him on the subject, begging that he would endeavour to get England and other countries to join with France in elaborating the much-needed reformation of the weights and measures of Europe. The political state of France was such at the time, however, that none of those Governments who were approached would fall in with their views. The Académie chose of its members the most famous *savants*, Laplace, Lagrange, Monge, and Condorcet. They presented a Report in about a year's time to the Assemblée Nationale, proposing to adopt as the fundamental unit the ten-millionth part of a quarter of the terrestrial meridian—that is to say, the distance from the Pole to the Equator. This unit was called the metre.

Now, this measure would have been comparatively easy to determine had the earth's figure been truly spherical. Some 150 years before this, our profound thinker, Sir Isaac Newton, was led by his investigations to conclude that our earth's shape was not spherical, but spheroidal, or like a ball flattened rather at the poles. The French Académie, desirous of proving the right or wrong of this, in 1730 sent out two expeditions, the one to Lapland, the other to Pern. These observers measured an arc of the meridian in each place with all possible care, and the results, when reduced, amply confirmed Newton's prediction.

If a ball is flattened at the poles, it swells about the middle, and to get the length of the distance from the Pole to the Equator it was determined to measure another arc of the meridian at about a mean distance from those previously effected.

This the Commission of 1791 proceeded to carry out, choosing as their base the line running from Dunkerque to Barcelona. The deduced distance from the measures taken with all possible accuracy proved to be 5,130,740 toises, the old standard measures of France. One ten-millionth part of this was adopted as the unit, and named the metre.

Having thus obtained a unit, the Committee proceeded to make other measures by multiplying or dividing up or down decimally, thus constituting another great change. So much for the measures of length. That of area or superficial measure is obtained directly from the first by taking the unit as a square formed upon a line 10 metres long. This, again, is decimally divided for the lesser denominations. Again, from the metre is obtained the unit of capacity. A cube formed from a generating line of $\frac{1}{10}$ of a metre was taken, and termed a litre; as before, this is applied to every-day life by the multiples or sub-multiples of 10.

There is only one other qualification we want in a body—its weight. Again the beautiful simplicity of the system supplies it at once, by taking as a fundamental unit, the weight of a litre of distilled water at its greatest density. In this instance, the name given to the new unit was the gramme or $\frac{1}{1000}$ part of the weight of the litre. Again, the use of 10 for the up and down scale of weights prevails.

In all these measures a uniform nomenclature was given by prefixes in *Greek* upwards, as decametre, decalitre, decagramme, for 10 metres, litres, or grammes, and in *Latin* prefixes for smaller denominations such as centimetre, centilitre, or centigrammes for $\frac{1}{100}$ metre, litre, or gramme. Practically speaking, however, many of these terms are in abeyance; no one speaks of one metre, two decimetres, three centimetres and five millimetres; the practice is universal to use the millimetre as the sub-unit, and say one metre, 235 millimetres. Similarly we find the divisions of the litre are spoken of as cubic centimetres, of the gramme as centigrammes and milligrammes.

We have here, therefore, a system self-contained and easy of application. Now, may I ask you to turn your minds to the systems in use here?

Our standard measures have the merit of antiquity, it is true, and they are but two in number—the yard and the pound. Neither of these are physical units, *i.e.*, they cannot be directly compared with anything in nature. The yard has been a legal yard since the Act of 1324. The *length* of that yard was only fixed by Act in 1824 by comparison with the length of a pendulum beating seconds *in vacuo* at the level of the sea in the latitude of Westminster. And from this it results that the length of the yard would vary as the latitude of the place, if such observations were made in other parts of the world, and it also varies according to the temperature.

Again, the pound as an *imperial* standard has only existed as such since 1855, though *a* pound was constituted by Act in the year 1495, and was only legal as the troy pound. This weight is now done away with, and the standard is the avoirdupois weight of 7000 grains.

* President's Annual Address to the Royal Photographic Society by the Earl of Crawford, K.T., F.R.S.

As above, it is not a physical unit, and is merely the weight of a lump of platinum, presently safeguarded at the Board of Trade. This unit also varies with the latitude of the place of use, depending as it does on the value of the force of gravity.

But we have to direct our attention more to the every-day use of the units rather than to their origin—here it is that complexity comes in as compared with the simplicity of the great rival.

If we take an ordinary formula as printed in the text-books involving ounces, and drachms, and grains, we are at once face to face with a difficulty, unless the author gives explicit directions as to the tables to be used. There are three ounces, and two drachms (though spelt differently), avoirdupois and troy and apothecaries—the ounce is respectively 437·½, 480, and 480 grains; the drachms, avoirdupois, 27·34375 grains, and the apothecaries', 60 grains. It is true that in general we use the apothecary weight, if we can, owing to the grain capacity of the ounce—but we buy our materials at one ounce, and make our formulæ at another, having a ratio between them of about 28 to 31.

Again, in using the fluid ounce, which has 480 minims, a difficulty always arises in making up our ten per cent. solutions. If we used a measured avoirdupois ounce of 437·5 grains, we cannot take 10 ounces of fluid, but must measure off carefully 437·5 minims.

But you will willingly pardon me for not pursuing this theme; the bothers of our weights and measures are like weekly bills, with us always, and none can appreciate them to a greater degree than my audience.

A weight often in our minds, though seldom in our hands, is the grain, and if it had to be dispensed often, the easiest way to get at it would be to dissolve 10 grains in 10 volumes of solvent, and take one-tenth of that volume; and I have little doubt but that most of those present, in toning, dissolve a tube of gold chloride in 15 drachms of distilled water, and take therefrom a drachm or two for the bath, according to the formula being used. I think it will very rarely occur that one single grain of a substance would be required for the bulk of fluid which has to be used at one time. Therefore there is no vital necessity for a weight so small as a grain; we could do equally well if the weight were much larger now we know that there are 15·43 grains in a gramme, and it is as easy to manipulate decigramme weights as to use grains; in fact, they are slightly larger, or in the proportion of about 20 to 31. It will not, therefore, be asserted that the metric unit or sub-unit is one which will not permit us to weigh out a sufficiently small quantity from our store.

Let us go a little further. We seldom find ourselves making up a formula to a single fluid ounce of any developer; we often make up 4 ounces. This is *nearly* equivalent to the tenth of a litre, or 100 c. c. (113·5864 c. c.). We have now a convenient weight for solids and a handy measure for fluids closely approximating to our daily comparisons. I have noticed a growing habit of expressing formulæ in percentage solutions, "take so many parts of a per cent. solution," to be made up to the volume of 100.

This use of the decimal system is most convenient, without doubt; yet I would urge you to go yet further, and adopt for your working the weights and measures of the metric system. Some may ask me if we use the percentage solutions you have just mentioned. Why trouble about getting new weights and glass measures? and my answer is that the grain and the minim are not an equal measure of water or any fluid, and therefore, from the lowest step in the scale, we commence with an error, which naturally grows with larger quantities.

I think it will not be denied that for accuracy the metric system by far transcends the non-methodical practice used still in England. I should weary you by giving extracts from Parliamentary papers giving the evidence of our *savants;* I will assume that the first part of my postulate, "conducing to accuracy," is granted.

My second point was facility of computation and manipulation. When a formula is presented to you by a foreigner in his writings, it is almost invariably given in the metric notation, and is made up with ease by those who are familiar with that system, but to many it is as yet a sealed book. But we more frequently find at home the formulæ thrown together to 4, 8, 10, 16, 20, or more ounces of water, more rarely are we given the proportions to 1 ounce.

Now, until the metric system has displaced all others, the old method is certain to appear, and we must find a means of translating the one into the other. Allow me to bring before you a way of doing this with comparative ease. It seems so simple that I can hardly think that it is not known, and yet I only found it in the effort to place a concise translation formula before you this evening.

Take any formula that you like; it consists of the weights to be measured out and dissolved in a certain number of ounces of water:—

1st. Call the new vol. of solvent ..... 1000 c. c.
2nd. If any of the ingredients run to ounces, take their ratio to the solvent and write down the same ratio to 1000 in .... grammes.
3rd. Divide each grain item by half the number of ounces and write down the result as ..... grammes.

Thus, if your formula contains 20 ounces of water, divide your grains by 10. If 8 ounces water, divide by 4, &c.

I am bound, however, to say that this rule is only approximate, the strength of the solution being slightly too weak. Still, for all practical work in the developing room I think it near enough; should it be desired to work to extreme accuracy, the divisors of the grain quantities must be reduced in the proportion of 24 to 25, or 4 per cent.

For those who wish to use the correct divisors, I add the table of them:—

Ounces in Solution.	Grains Divisor—approximate.	Grain Divisors—correct.
1	·5	·48
2	1	·96
4	2	1·92
6	3	2·88
8	4	3·84
10	5	4·8
12	6	5·76
14	7	6·72
16	8	7·68
18	9	8·64
20	10	9·6

Let me take an old formula and translate it for you:—

	Approximate.	Correct.
A. Pyro 2 drachms {(60 grains) divide by 8	Pyro ... 7·5 grammes	7·812
Citric acid 15 grains, divide by 8	Acid ... 1·875 „	1·953
Water ... ... 16 ounces; write	Water ... 1000 c.c.	1000

Another:—

	Approximate.	Correct.
Sod. sulph. ... ... 2 ounces	100 grammes	100 grammes.
Sod. carb. ... ... 4 „	200 „	200 „
Pot. carb. ... ... 2 „	100 „	100 „
Hydroquinone ... ... 30 grains	3 „	3·125 „
Potass. brom. ... ... 40 „	4 „	4·166 „
Water... ... ... 20 ounces	1000 c. c.	1000 c. c.

I think this will suffice to make my meaning clear, and I must pass on to the actual manipulation. It is not every one who has in their possession a set of metric weights and measures, but that need not hinder us greatly; we can with ease make for ourselves a set good enough for all practical work. First, as to weights.

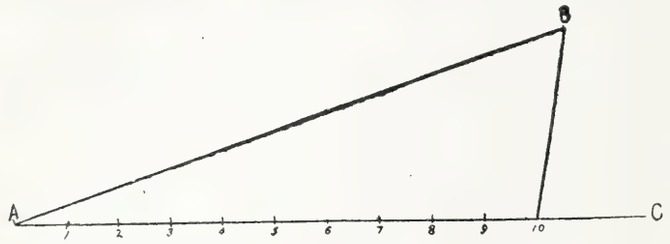
The French silver and bronze coinage form good weights, provided they are clean and not worn by long use.

They weigh as follows:—

Silver Coins.		Bronze Coins.	
5 francs	25 grammes.	10 centimes	10 grammes.
2 „	10 „	5 „	5 „
1 franc	5 „	2 „	2 „
½ or 50 centimes	2½ „	1 „	1 gramme.

If some of these are procured, say, 10 French pennies, and a few halfpence, they will prove very useful; indeed, I always have a few in a handy box near the scales. But the smaller bronze coins of France are not always to be found, and it is frequently necessary to use lesser weights than 10 or 5 grammes; they can be made at home well enough in this way: Get a piece of copper wire rather thin, so that 10 or 12 inches are

balanced in the scales by the 10-centime piece. With a file adjust it true and straighten the wire out, next on a sheet of paper lay out the exact length of the new weight, *i.e.*, the wire, thus, A B.



Next draw the line, A C, at any angle from A B, and divide it with a pair of compasses into ten equal parts. Then join B to 10, and parallel to this line draw others from each division to the line A B. This will divide A B into ten equal parts. Now take the wire weight, and with a sharp chisel cut it at each division marked on the line A B of the paper. If this is carefully done, each of the pieces of wire will weigh 1 gramme. A similar operation may be gone through with thinner stuff, or aluminium wire, to make the tenths of the gramme.

Now as to the measures of fluid for those who are not provided: Take any vessel convenient, put it in your scales and carefully balance it by means of, say, small shot in a bag or box. This once done, the shot weight can be used in after work as long as agreeable. Then, if, say, 100 cubic centimetres of a fluid are wanted, simply put the 100 grammes in the scale *with* the shot weight and fill the vessel till they balance. It is simplicity itself.

I think I may claim for my second postulate facility of manipulation and computation, and I pass to the final stage.

I confess at once that I cannot foretell the increase that would follow in the export trade should our makers adopt the metric system. I have little doubt but that it would be large, and in this I am guided by the Annual Trade Reports, which are made by Her Majesty's Consuls throughout the world. The greater number of these gentlemen reiterate year by year that our complicated system prevents large numbers of buyers from taking British goods, because they cannot, or will not, be at the trouble of converting our measures into their own.

The civilised nations of the world who are at present using the metric system have an aggregate population of 445,300,000, and, if we confine ourselves to Europe alone, we find that all nations have adopted it save Denmark and our own country; even the ultra-conservative Russia has commenced its use.

The material we turn out for export from this country is, without doubt, equal to the very best; how is it, therefore, that the export is so small? I see by trade lists that our principal plate-makers are prepared to supply their goods cut to suit the foreigner, but I hope that there may be a further move in the adoption throughout the country of the metric-sized plate. The camera makers would immediately follow suit, and I fearlessly state that, though their workmanship is far and away above anything to be got on the Continent, yet at present they are there unknown, simply because their goods cannot be used with foreign plates.

I need hardly remind you also of the great numbers of foreign gentlemen and ladies who annually visit our country—great numbers of these carry cameras—yet it is the rarest thing to see our goods in their hands, because, when they return to their homes, the difficulties of size are paramount.

Still less need I remind you how easy it is to find ourselves running short of plates when travelling in foreign countries. How difficult it is to find our requirements in foreign stocks, and also how pleasant would be the relief to our minds in the knowledge that we need not feel obliged to pass on from a picturesque corner we have discovered, and leave it to a more fortunate successor, simply from the fear of shortening our pleasure, owing to the lack of replenishment of our stores.

In reality, the differences of sizes of plates here and in other countries is but small, and could rarely be ascertained from the finished print; it therefore rests with the individual photographer to decide. I have heard it stated that the British public are so wedded to the sizes they are familiar with that they would resent alteration. This, I think, is an error of description. The British public judges the picture size from the card upon which it is mounted, and naturally the question of trimming remains in our hands.

To sum up. The adoption of a change of system in our community must lie with the individual; vast numbers yearly commence to learn, and most of them purchase a small outfit. Much may, therefore, be done by the makers of popular goods by giving metric dimensions to their cameras or plate-holders, and stating to would-be customers that suitably sized plates would be found in most parts of the civilised world.

If I be sufficiently fortunate to capture the suffrage of this Society, I would remind the Fellows that by their action in past years they established uniformity of system in sizing and naming the diaphragms of lenses, and again in the diameter and pitch of the screw threads of their mounts.

One more potent auxiliary I would fain enlist, the photographic and technical press—a power not to be lightly regarded in this or any other country, for it has at command an able body of men, whose writings carry weight, and ofttimes conviction, to the fireside of our homes.

Great Britain is a country to be proud of, but we must remember that it is slow to move and averse to change. I think, however, that a change has come over the spirit of the nation since I had first to do with this question in the early years of the seventies; and I would urge on photographers to be early in the field to take the ball on the bound, and thereby reap a benefit both mentally and physically and in your pockets.

Should my poor efforts prevail, I should feel that your President had not laboured in vain, and I could look back with pride at a tenure of office during which so great a measure of reform had been instituted. I feel that I must apologise for having been forced at times to speak below the intelligence of my audience, but I was anxious to make myself clear as well to the beginner as to the past masters of the art and craft of photography.

DIPHENAL—A NEW DEVELOPER.

To the current number of the *Photographische Correspondenz* Dr. Julius Precht, of Heidelberg, contributes a note on this subject, an abstract of which may be interesting to our readers.

Diphenal is diamido-oxydiphenol, and is prepared from the acid extract of oxyazobenzole, and has been patented as a photographic developer by Leopold Casella & Co., of Frankfort, by whom it is placed on the market in the form of an alkaline solution, the salt itself forming white needle-like crystals, the solution being a dark-brown colour, which on dilution with water forms a nearly colourless solution, which does not stain the films nor the fingers unless the latter are kept in the same for a very long time. It is stated to have all the conveniences of rodinal, with the advantages of pyro and iron. It gives extremely clear shadows, works very cleanly and free from fog, and gives all the delicacy and gradation of pyro. It surpasses all other developers in the latitude of exposure it allows, and with very great over-exposure there is no trouble; what it is necessary to do is to develop till the high lights are dense enough, and the shadows keep beautifully clear, more so than with any other developer except glycin.

It is specially suitable for objects with great contrasts, as it does not block up the high lights, and amateurs who are by no means certain of their exposures will find it exceedingly useful, as it so rarely gives fog. It is not a very rapid developer, the half-tones and shadows succeeding the high lights in a regular manner, and not coming up simultaneously like metol, amidol, and rodinal.

The stock solution is, for ordinary work, diluted with 15 parts of water for normal and over-exposure, whilst for under-exposure it may be used with only 8 or 10 parts of water. The brown colour of the solution is not a sign of oxidation, as the stock solution has been kept for five months unchanged, and the diluted solution also keeps well. By repeated use the negatives do not, as with hydroquinone, become harder.

With normal exposure and concentration the image appears in about twenty seconds, and development is complete in from five to ten minutes. With under-exposed plates, and a strength of 1 : 8, development may be continued for half an hour without harm. When it is known that correct exposure has been given, the developer may be used 1 : 10, and the image appears very quickly and development will be quite complete in about three minutes.

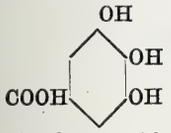
It is necessary to well wash the plates after development in order to free it from the developer. If some of the ordinary fixing bath is mixed with a small quantity of the developer, the solution turns brown by the absorption of oxygen and a liquid is obtained which dissolves silver, and therefore can be used as a reducer. The brown solution thus formed also stains the gelatine. Diamido-oxyphenol can also be used without alkali as a developer, a property which is common to other para-amido-phenols.

THE INFLUENCE OF KETONIC GROUPS UPON THE DEVELOPING POWER OF POLYPHENOLS.

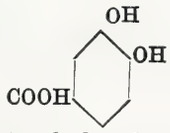
[Translated from the Moniteur de la Photographie.]

It has been shown that the substitution of the carboxyl groups (C O O H), in an aromatic nucleus considerably lessens—and in certain cases even entirely destroys—the developing properties which the introduction of the phenolic hydroxyl confers upon it.

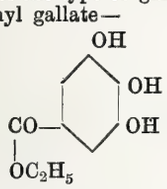
Thus gallic acid, which has the formula—



and pyrocatechic acid



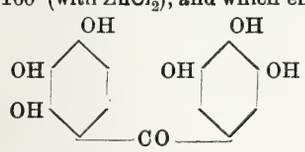
are not developers, although they each contain two hydroxyl groups in the ortho position, whilst pyrogallic acid and pyrocatechin, which differ from them merely by containing no carboxyl group, possess developing properties. On the other hand, it has been shown that this influence of the carboxyl group must be attributed to its acid character, since, after etherification, compounds of the type of gallic acid again exhibit developing properties. Thus, ethyl gallate—



develops the latent image.

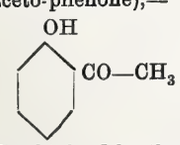
We may argue from this that the presence of the ketonic group (CO), which has only feeble acid properties, should only slightly weaken the developing power of polyphenols, or have such insignificant action as to permit of employing certain oxyketonic bodies (used in commerce as colours for metallic mordants), as developers. The bodies in question are easily obtained by condensation of acids, or of acid phenols with phenols, and, having in mind what we know of the developing functions of these latter bodies, the ketonic compounds should, *à priori*, be energetic developers.

Thus, among others, the hexa-oxy-di-phenyl-ketone, obtained by heating pyrogallic acid to 160° (with $ZnCl_2$), and which encloses two residues—



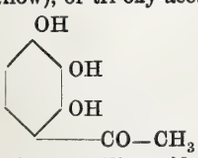
of pyrogallic acid joined by a ketonic group, ought to be, *à priori*, a very energetic developer, if the group CO is without influence on the developing power. Experiment does not confirm this expectation, however, for hexa-oxy-di-phenyl-ketone does not develop the latent image at all, showing that the group CO can, under certain circumstances, destroy the developing power of hydroxy-phenols. In order to find under what particular conditions this takes place, we have experimented first with simple oxyketones, whilst comparing them successively with oxyketones containing an increasing number of hydroxyl groups.

Chinaceto-phenone (Di-oxy-aceto-phenone),—



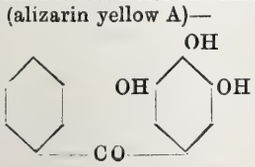
Yellow crystals (melting at 202°), obtained by the condensation of hydroquinone and acetic acid in presence of zinc chloride. Dissolved in alkalies, it develops the latent image as easily as hydroquinone.

Gallaceto-phenone (alizarin yellow), or tri-oxy-aceto-phenone,—



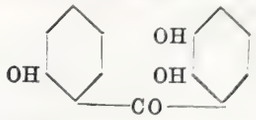
Produced by the condensation of pyrogallic acid and acetic acid, by heating together to 145°—150° with zinc chloride. It forms white mother-of-pearl crystals, which melt at 168°. In alkaline solution it develops the latent image energetically, giving results comparable with those of methyl gallate, which it resembles in constitution.

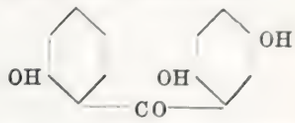
Tri-oxy-benzo-phenone (alizarin yellow A)—



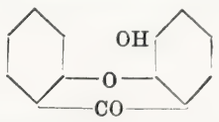
Produced by condensation of gallic and benzoic acids by heating to 145° with zinc chloride. In alkaline solution it develops the latent image, but not so strongly as gallaceto-phenone.

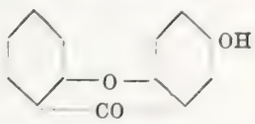
We have not tried the condensation products of pyrocatechin and hydroquinone with salicylic acid, which would have the formulæ—





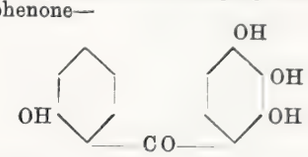
For by condensation we do not obtain these bodies, but their anhydrides—





And these bodies do not possess the developing function.

Tetra-oxy-benzo-phenone—



Produced by condensation of pyrogallol and salicylic acid, by heating to 145° with zinc chloride. Pale greenish-yellow crystals (melting point 149°), which in alkaline solution do not develop the latent image.

No developing action was observable in the case of tetra-oxy-benzo-phenone (from pyrocatechin and protocatechic acid), penta-oxy-benzo-phenone (from pyrogallol and protocatechic acid), morintannic acid (extracted from yellow wood), hexa-oxy-benzo-phenone (from gallic acid and pyrogallol), or tetra-oxy-phenyl-naphthyl-ketone (from gallic acid and *a*-naphthol).

Conclusions.—The study of the developing properties of the foregoing bodies shows—(1) That the ketonic radicle, occurring in a group, containing one or more phenolic functions, does not appreciably modify the developing properties conferred upon the compound by these phenolic groups, provided that the ketonic group (CO) is joined also to a fatty residue, or to an aromatic radicle containing no hydroxyl; (2) Developing power is destroyed when one or more substituted hydroxyls occur in this second aromatic radicle.

En résumé, it is not possible (as might have been supposed from *à priori* reasoning) to increase the developing power of a polyphenol by joining a second polyphenol group to it by means of a ketonic (CO) group; the result of doing so is, in fact, to destroy the developing power.

Lumière Frères and Seyewetz.

[Note.—To those who may desire to follow the author's researches, and have not acquaintance with organic chemical symbols, it may be said that the plain hexagonal figure  is the conventional formula for benzine (C_6H_6), an atom each of carbon and hydrogen being imagined at each point of the hexagon. When any other group is substituted, the atom of hydrogen is considered as removed. Thus, phenol (C_6H_5OH) is written  . "Condensation" is the union of two compounds with expulsion of a molecule of water, zinc chloride being used to take up this expelled water.—Translator.]

IVES'S METHOD OF ILLUMINATING PHOTO-CHROMOSCOPE PICTURES.

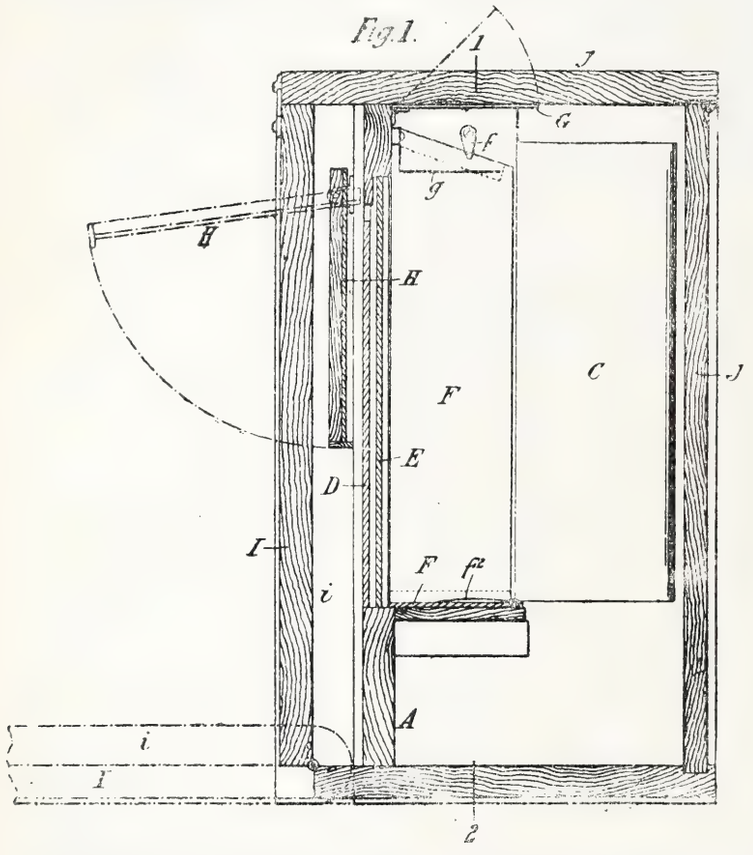
This is a device or apparatus by means of which photo-chromoscope pictures can be exhibited very efficiently by artificial light and the pictures be readily changed whilst the photo-chromoscope is secured to or in the said device or apparatus so that it cannot be accidentally displaced.

Fig. 1 is a vertical longitudinal section of a device or apparatus in its closed position. Fig. 2 is a section on the line 1—2 (fig. 1). Fig. 3 is a horizontal section, and fig. 4 is a perspective view of the apparatus in its open position and with the photo-chromoscope (marked x) in position. *x* is a mirror connected with the photo-chromoscope.

A is a case for containing the lamp by means of which illumination is obtained. The lamp chimney is indicated at B, in fig. 4, but the lamp is not shown in the other figures. It may be of any suitable kind, such, for instance, as a lamp provided with an Auer von Welsbach mantle. In the rear part of this case, says Mr. Ives, I mount a reflector, C, preferably with a flat back and sides inclined outwards towards the front as shown. In front I mount a sheet of opalised glass or translucent material, D, and preferably also a sheet of glass or transparent material, E, which is tinted, so as to correct any defect of colour of the illuminant. Between these sheets, D and E, and the lamp, I preferably, but not necessarily, place at bottom and at the sides of the case reflectors or mirrors, F, which may be

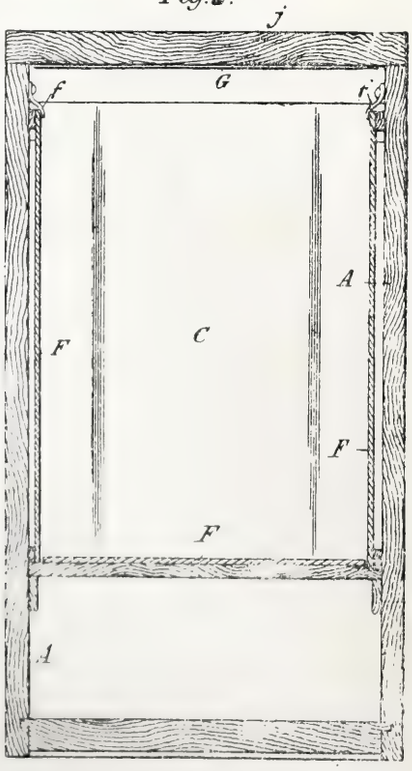
of silvered glass. They are shown as being retained in place by the buttons, *f*, and spring, f^2. Above I place a hinged piece, G, which is preferably blackened, and, beneath this, a blackened screen, *g*, extending

Fig.1.



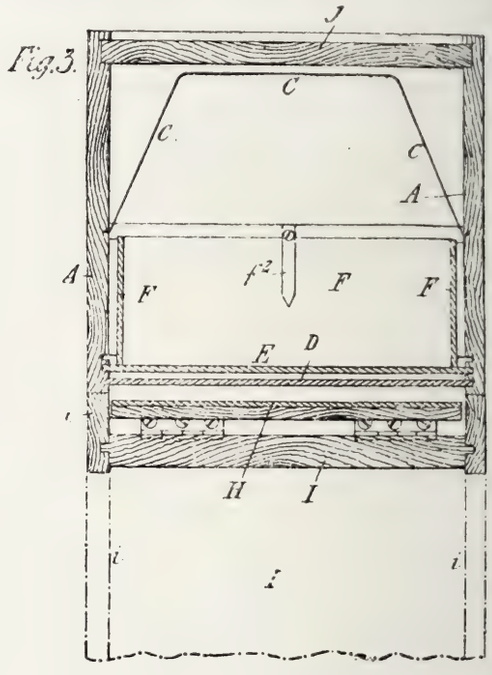
horizontally inwards from the inside of the front of the case, say to about the same extent as the width of the bottom and side mirrors or reflectors, F. Outside the case, at the upper front part thereof, I hinge a mirror or reflector, H, with its reflecting surface on the underside, and, at

Fig.2.



the bottom of the front part of the case I hinge a platform I made with guides or side ribs, *i*, between which the photo-chromoscope, X, can be placed, so that it is held in proper position relatively to the illuminating device or apparatus. The mirror or reflector, H, above being turned down its front edge, will rest upon the upper part of the photo-chromoscope, as shown in fig. 4 or upon any other suitable stop, and the said mirror or reflector, H, will then optically duplicate at a suitable angle for illuminating the upper sections of the chromogram, the light diffused, through the sheet, D, from the lamp and reflectors, C F. By the use of the mirror or reflector, H, the intensity of the illumination of the photo-

Fig.3.



chromoscope by a given source of light is about twice as great as it would be if the sheet, D, were made long enough to light the whole series of images, and at the same time to be at such a distance therefrom as not to impede the changing of the chromograms. I do not limit myself to the method of supporting the mirror or reflector, H, as shown, as it can be supported in any convenient manner. The reflectors, mirrors, and screens in the illuminating device are preferably secured so as to leave a little space between them and the case, A, for the circulation or passage of air.

Fig.3.

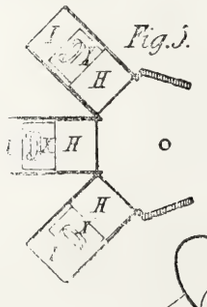
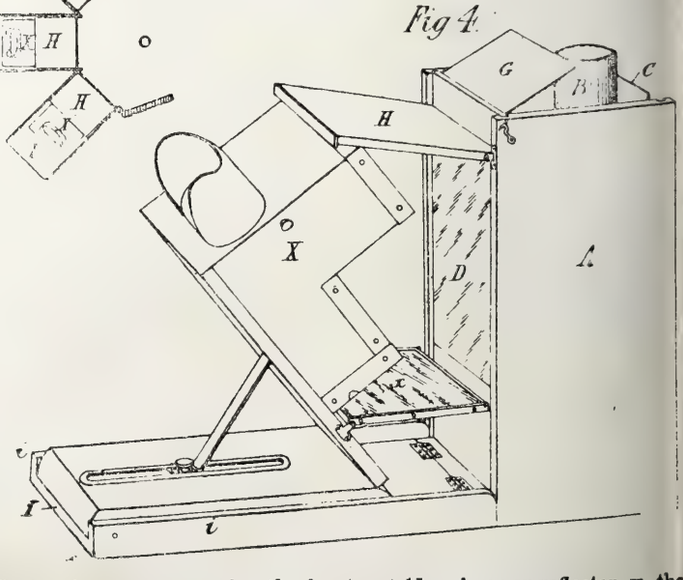


Fig.4.



By turning up or removing the front outside mirror or reflector, H, the pictures can be removed from, and fresh ones placed in, the photo-chromoscope with great facility, and, when the apparatus is not in use, it can be folded up very compactly by folding down the outside front mirror or reflector, H, folding up the platform, I, and sliding in a panel, J, at the back provided with a flap, *j*, which can be turned over to cover the top and be secured to the turned-up platform.

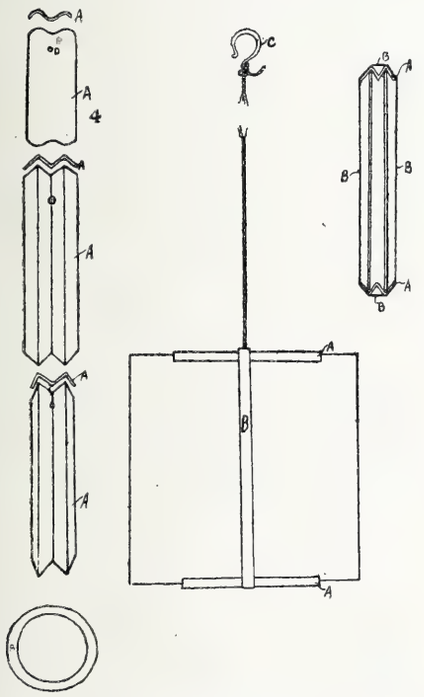
Although I have shown only one opal or translucent glass, D, and

mirror, H, and support, I, for one photo-chromoscope, I may use two or more such glasses, mirrors, and supports in connexion with an illuminating device (such, for example, as an arc lamp or any other lamp which will give a sufficient light). For example, in fig. 5 I have shown a diagram embodying three glasses, D, and mirrors, H, each for illuminating a photo-chromoscope, K, each supported by a support, I. Provision for illuminating two or more than three photo-chromoscopes may be similarly arranged. In such an arrangement the inside reflectors will be correspondingly modified in position or they may be omitted.

A HOLDER FOR NEGATIVES AND FILMS.

The Rev. C. E. Few, of Sevenoaks, has devised an improved method of holding photographic plates and films for washing and drying purposes, by means of which plates of any size can be readily washed without danger of abrasion of gelatine films, and in any ordinary vessel.

For this purpose he stamps, moulds, or presses bands of suitable material, such as celluloid, ebonite, or metal, into two or more grooves,



in shapes convenient to hold the plate or film without injuring the surface, marked on drawing, A.

These grooved plates are then placed at opposite ends of the plate or film, and are then held together by one or more elastic bands, B.

For convenience a hook, C, may be affixed to the grooved plates, from which a string could be passed to suspend the holder, or a hole, D, might be drilled through the holder for the same purpose.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The following is the balance-sheet of the Great Yarmouth meeting:—

Dr.

	£	s.	d.
To hire of rooms for Council Meetings (4)	1	2	0
Balance old account paid (Briginshaw)	2	15	0
Research grant (Haddon and Grundy)	10	0	0
Badges for members	9	7	6
Exhibition expenses	33	3	7
Printing expenses	22	4	6
Postage, parcels, telegrams, petty cash, &c.	8	3	11
Balance	51	9	6
	£138	6	0

Cr.

	£	s.	d.
By balance, 1896 account	36	13	9
Exhibition receipts	14	7	3
Advertisement receipts	26	0	0
Subscriptions (245)	61	5	0
	£138	6	0

	£	s.	d.
By balance	51	9	6
Invested in Post Office Savings Bank in names of S. B. Webber and R. P. Drage	125	0	0
Interest accrued on ditto (about)	3	15	0
Total Convention Funds	£180	4	6

R. P. Drage, *Hon. Sec.*

Audited and found correct, Thos. Fall.
September 27, 1897. John Howson.

PHOTOGRAPHIC EXPORTS.

Compiled from the Customs Entries.

September, 1897.

Adelaide	£295	Brought forward	£3447	Brought forward	£6008
Alexandria	60	Cospoli	6	Oporto	21
Amsterdam	50	Durban	389	Otago	31
Auckland	426	East London	130	Penang	25
Bangkok	220	Flushing	333	Perth	113
Barbadoes	39	Freemantle	274	Port Elizabeth	231
Bombay	955	Ghent	100	Rangoon	50
Boulogne	73	Genoa	150	St. Petersburg	125
Brisbane	19	Hamburg	128	Shanghai	186
Buenos Ayres	201	Hiogo	39	Smyrna	62
Calcutta	329	Hobart	126	Stockholm	115
Cape Town	235	Hong Kong	111	Suakim	60
Canterbury	21	Kobé	269	Sydney	930
Chinde	40	Kurrachee	10	Trinidad	46
Christchurch	16	Lyttleton	45	Wellington	2
Christiania	388	Madras	46	Yokohama	231
Colombo	80	Melbourne	405		
Carried forward	£3447	Carried forward	£6008	Total	£8236

September, 1896.

Adelaide	£374	Brought forward	£3620	Brought forward	£5898
Amsterdam	26	Flushing	340	Otago	106
Auckland	421	Freemantle	158	Penang	48
Bangkok	68	Ghent	404	Perth	23
Barcelona	64	Gibraltar	13	Port Elizabeth	328
Bombay	794	Hamburg	47	Rangoon	68
Boulogne	177	Hiogo	33	Rotterdam	15
Buenos Ayres	158	Hobart	18	St. Petersburg	97
Brisbane	20	Hong Kong	25	Shanghai	362
Calcutta	430	Invercargill	165	Stockholm	109
Cape Town	374	Kurrachee	61	Sydney	1156
Canterbury	16	La Tréport	40	Timaru	18
Chinde	17	Las Palmas	10	Tokio	9
Christchurch	124	Lyttleton	25	Trinidad	27
Colombo	109	Madras	350	Wellington	496
Delagoa Bay	20	Montreal	110	Yokohama	139
Durban	201	Melbourne	454	Zanzibar	28
East London	227	Oporto	25		
Carried forward	£3620	Carried forward	£5898	Total	£8927

Our Editorial Table.

How to Make Transparencies, Lantern Slides, and Stereoscopic Slides.

Published by Mawson & Swan, Soho-square.

Brief and clear directions are given in this little pamphlet for the proper production of lantern slides and transparencies, all the operations from exposure to varnishing being succinctly described. The information and hints are sound and practical, and are calculated to be of great use to the photographer making transparencies. A number of selected formulæ are included in the pamphlet, which may be obtained from Messrs. Mawson & Swan, at either their London or Newcastle-upon-Tyne address.

The "XL" Lantern-slide Outfit.

B. J. Edwards & Co., The Grove, Hackney, N.E.

Appropriate to the season, when so much time is expended by photographers in the production of transparencies for the optical lantern, Messrs. Edwards are issuing a lantern-slide outfit, complete down to the smallest detail, for producing lantern slides by contact.

The outfit includes: a supply of 'Anti-halo' lantern plates; cover glasses; a suitable developer; clearing solution; tin of hypo; a developing dish formed of celluloid in thin metal which allows of the image being viewed by transmitted light while in the dish; printing frame; masks and binders, and a bottle of varnish. This is a handy and convenient set—and, by the way, what an admirable Christmas present it would form for a young photographer—which is sure to be widely appreciated. A special word of recognition is due to the Edwards lantern plate, which yields most charming colours for lantern slides.

Specimens of Three-colour Photography.

John Swain & Son, Photographic Engravers, High Barnet, N.

The specimens of three-colour printing that Messrs. Swain have sent us include reproductions of nature subjects, such as fruit, a vase, bottles of pickles, &c., coloured advertisements, and water-colour drawings. Close examination of the work before us shows it to have been extremely well done, and convinces us that for purely commercial purposes, at any rate, the three-colour process is likely to win great and immediate patronage. The colours of the originals seem to have been correctly translated, and the printing is good, the registration being extremely accurate.

Catalogues Received.

Mr. W. F. Slater, of 169, Southampton-street, Camberwell, S.E., has sent us his catalogue of second-hand apparatus. Many a bargain is included in the list, which comprises some 200 varied items.

Ross, Limited, 111, New Bond-street, W.

A copy of the new edition of Messrs. Ross's Catalogue, which is chiefly intended for transmission abroad, has been sent us. It is devoted to an exhaustive and illustrated *résumé* of the firm's many specialities in photographic and philosophical apparatus, lenses, of course, receiving the chief prominence. Several well-printed half-tone reproductions, in size about $12 \times 7\frac{1}{2}$, from negatives taken with the firm's lenses, are included in the catalogue, which extends to over 160 pages, and is a compilation that is creditable to all concerned.

News and Notes.

Photographic Club.—Wednesday evening, October 20, at eight o'clock. Subject, *Which is the Best All-round Printing Process?*

Messrs. Thorn & Hoddle have removed to New Tothill-street, Victoria-street, S.W., where they have taken commodious premises, comprising offices, showrooms, and warehouse.

Royal Photographic Society.—Photo-mechanical Meeting, October 19, at the Gallery, 5a, Pall Mall East. *The Heliochrome Process, and its Application to Artistic and Commercial Illustration*, by Paul L. Waterlow.

A substitute for lacquer has been placed on the market by the Frederick Crane Chemical Company, of 22, Newhall-hill, Birmingham, who claim that the merits of the new preparation, which is termed brassoline, over ordinary lacquer, are (1) that it is applied cold and gives a far better and more lasting finish to the goods; (2) that it is harder and more brilliant and is absolutely waterproof, while the sea air in no way affects it; and (3) it does not cloud when being applied even in the dampest weather. They also claim that it shows no brush marks, and that neither age nor exposure has any deteriorating influence on its brilliancy.

Durham City Camera Club.—The Fifth Exhibition of Photographs will be held in the Shakespeare Hall, North-road, Durham, on Monday and Tuesday, November 29 and 30. The following classes are open for competition:—Class 1, Landscapes or Seascapes; any size or process. Class 2, Portraiture and Figure Study; any size or process. Class 3, Architecture; any size or process. Class 4, Instantaneous, Flowers, or any subject other than Classes 1, 2, and 3; any size or process. Class 5, Lantern Slides, set of six. Ten medals (five silver and five bronze) and certificates are placed at the disposal of the Judges. The entries close November 19. Entry forms and any further information may be obtained from Mr. R. Hauxwell, Hon. Secretary, The Avenue, Durham.

No Smile in the Picture.—Thomas Aspinall, forty-one, canvasser, who gave an address at Newington-butts, was brought up on Monday for examination, charged with fraud and obtaining money by false pretences. Mr. Frederick Hill defended. The prisoner has been for twenty years employed by a firm of photographers, who have many branches, and who make a speciality of portrait clubs, the members of which pay a weekly subscription. It was alleged that the accused, after altogether ceasing his connexion with the firm in January, solicited and obtained subscriptions from various young men on the representation that he was still employed. The prosecutors said that, being unable to get their photographs, they made complaints, and alleged that they had been defrauded. In examination, they admitted that they had been taken to be photographed to a place in the Brixton road, and had received proofs of the pictures taken. One young man considered he had been defrauded because the photographer—not the one he had contracted for—had not given him "a pleasant look" in the picture submitted for approval. The accused was remanded.

Improved Glass-cutting Appliances.—To facilitate the measuring and cutting of plate glass, a gauge and appliances have been patented by John W. Seiter, of Harlan, Ia. A graduated rail is rigidly secured to a suitable bench, one side of the rail projecting upward to form a flange, and sliding on the rail is a carriage bar, in whose under side is a rabbet groove, in which the rail is received, the inner side portion of the carriage bar overhanging the inner side of the rail. The under side of the bar, which is flush with the bottom of the rail, has a dovetail recess, in which the dovetail end of a guide bar is secured, the depth of the recess being such that the lower surface of the guide bar will be raised above the surface of the bench, and above the lower face of the overhanging portion of the carriage bar, so that the plate glass may be placed under the guide bar, to bear against the carriage bar. A rib on the upper side of the guide bar forms a rail, on which slides a carriage block, to which a glass-cutting blade of any desired form may be pivoted, the carriage bar being adjustable along the graduated rail, and taking with it the guide bar which is adjusted on the glass plate to the desired size of glass to be cut.

Re Joseph Percival Crawley and Mary Crawley, his Wife (trading as M. Vance, Photographers, 140, St. Stephen's-green, Dublin).—A circular has been sent to the creditors interested hereunder by Messrs. Stewart & Orr, of 33, Lower Ormond-quay, Dublin, to the following effect: "Owing to the wet season, and depression in trade on account thereof, the above-named debtors are unable to meet their engagements with their creditors, and have been obliged to obtain the protection of the Queen's Bench Division of the High Court of Justice in Bankrupty. A preliminary meeting of the creditors will, however, be held, at which an offer of composition and a statement of affairs will be submitted." The meeting has since been held at the offices of Messrs. Kevans & Sons, chartered accountants, of Dame-street, Dublin, at which a statement of affairs was presented, showing unsecured liabilities amounting to 447*l.* 19*s.*, and preferential creditors amounting to 57*l.* 5*s.* 2*d.* The assets consisted of book debts, good and bad, 8*l.* 7*s.*, estimated to produce 3*l.*; photographic apparatus, &c., valued at 36*l.* 18*s.* 1*d.*; studio furniture, 23*l.* 3*s.*; cash in hand, 1*l.* 14*s.* 6*d.*; total, 64*l.* 15*s.* 7*d.*, from which 57*l.* 5*s.* 2*d.* has to be deducted for the claims of preferential creditors, payable in full, leaving net assets at 7*l.* 10*s.* 5*d.* The debtors submitted an offer of 1*s.* 6*d.* in the pound, payable by two instalments at six and twelve months, which was accepted.

The Photographer and his Studio.—At the Porth (Glamorganshire) Police Court, on the 7th inst., Alfred Orton, described as a travelling photographer, now residing at Ferndale, was charged with erecting a wooden building for a studio in the locality without submitting plans to the Rhondda District Council. It appeared from the evidence of Sanitary Inspector Reid, of Ferndale, that the defendant went to the neighbourhood in July last, and erected a wooden structure 19½ feet long, 10 feet wide, and 7 feet in height, at the south end of the Dyfiryn Hotel. No plan of the building had been submitted to the District Council. The defendant, interposing, said the building was a portable one, and was light enough to be carried by four persons. Mr. Nicholas, on behalf of the prosecution, stated that the District Council had resolved not to allow the erection of wooden buildings in the district, and were determined to enforce the by-law. He denied that the Council had received any plan of the structure. The defendant, in reply to the Bench, said he paid rent for the site, but did not pay any rates. He also stated that he had been travelling as a photographer in the valleys for the last twelve years, and had never been summoned before. Mr. Nicholas said he should have to ask the Bench to state a case if they decided the matter against him, because the Council would take the matter to a higher court. The magistrates' clerk said they did not want a second Caerphilly incident there. After the Bench had consulted together for some time, and had conferred with the magistrates' clerk, they announced that they were divided upon the question. The case was accordingly adjourned for a week, in order that another Bench might be obtained, or additional magistrates might be called to hear the case.

Unregenerate Criticism.—We cull the following amusing little squib from a country contemporary:—The Unphotographic Salon.—The Fifth Exhibition of Æsthetic Photography was opened on Saturday. Personally we are not "in the know" respecting the aims and objects of these camera conjurers, but an up-to-date friend kindly trotted us round the gallery, and explained things as follows: "This is an example of what we may call pepperpot photography. The object in view is to show what pretty pictures can be got with the most unsuitable means. Here, again, observe the grand effect produced by a judicious crossing of the methods of the old blue china plaques and crayons on rough paper." "Yes, yes!" we exclaimed; "but what a ripping thing that is over there," and we pointed to a big, silvery-looking article which might have served for the decoration of a high-art iron safe. On consideration, however, we concluded that the butterflies and daisies with which it was embellished made it better suited for a tea canister. We afterwards found out that it was meant for a frame. "See here," said our guide, "the photographic poster has arrived!" Sure enough there she was—the hideous daughter of Beardsley, clad in a neat costume cut out of sticking plaster. From this we turned wearily away. "Hullo! that's neat—that woman there, without a head, who is looking at a negative. Seems appropriate too—so symbolical, don't you know, of how most of them examine their works." The guide sorrowfully checked this rash irreverence and painfully pointed out that there *was* a head, but that it had somehow got entangled in the tall young person's "balooners." "In the next," droned out our guide, with verger-like intonation, "behold the induction of Queen Camera to the Seats of the Mighty. The design is called *Photography Receiving the Approbation of Science and Art.* Although the title suggested *Biggs Receiving the Encouragement of Drivelli and Toothick*, we could not linger long before the above. "This, now, is more in our style," we informed

ur guide, *A Study in Blood*, by M. Brenard. Not only do we admire the blood, ut also the flesh, which last is superb! Pity the lady's name is not given." What are you staring at? come along, do," said our guide, rather pettishly. See here, we have colour photographs." "So, at last!" we murmured. And it is just as we expected. Nature and the camera can never colour as he human eye can see; the glories; the rainbow hues; the opalescent glints; he——" "Hold on," said the guide. "Although these are coloured by hotography, the colours themselves are selected by the photographer." Well, if this is Art, give me Nature. After all, if she be not so good a olourist as Imagination's airy fancy would paint a scene, she cannot turn ut stuff like this." And we pointed disdainfully—for we felt disgusted—at ertain eyesores in green, blue, and brown. "Where," we queried, "are he rest of the technical exhibits?" "Husb," whispered the guide, "for oodness sake don't talk of technique here. All that they recognise in his place is ART!" "If that is so, give us what you call 'the other thing.' When *we* come to look at photographs, we don't want to be put off with alting imitations of chalk drawings, nor with far-away copies of the old nasters, nor with those abominably crude colour smudges. What we want o see are choice examples of the incomparable qualities of which a good hotograph possesses the monopoly."

UTILISING THE SUN'S RAYS FOR DRIVING MACHINERY.—Trying to devise ome way of using the sun's rays for running machinery has long been a favourite study with inventors, and a number of patents for solar heaters and olar engines of many kinds have been taken out. Various kinds of small motors have been driven by using solar heat to raise the temperature of water, of alcohol, of soda solutions, and of air. Solar engines are sometimes employed for working pumps, and a small locomotive is said to have been run across a desert by no other agency. It has been reckoned by M. Mouchon, an eminent French scientist, that it is practicable to boil two pints of water and keep it boiling with the rays that fall upon one and a half square yards of surface. One square yard of sunshine represents one horse power. The problem, accordingly, is merely to concentrate the rays. Mr. F. H. Monks, a Boston inventor, has patented a machine which consists of a small boiler and a large concave mirror. A familiar contrivance called a heliostat, run by clockwork, moves the mirror with the sun so as to keep its focus always on the boiler. The rays concentrated at this focus heat the boiler and generate steam, which drives an engine. More complete perhaps is a machine devised by another citizen of the modern Athens, named Severy "for obtaining continuous power from the sun." The principle is the same as in the other case, but the surplus energy is used to fill with water a storage tank up above. When the sun goes behind a cloud, thus suspending the operation of the solar motor, a tripping mechanism automatically starts the water, which takes up the task. Thus there is no pause in the action of the machine. An Englishman named Clarke has produced a contrivance which ought to be of use on the Klondike, being designed to reduce and disintegrate ores. It is a gigantic lens of glass, hollow and filled with distilled water, so as to be free from imperfections. So great is its size that gold ores are melted beneath its tremendous focus. The trouble about lenses, however, is that they are exceedingly costly. If they could be made of large size, and at a comparatively small price, the problem of solar mechanics would be simplified very much. As it is, multiple reflectors are commonly used instead. For example, William Calver, of Washington, has patented an arrangement of boilers and reflectors which travels around slowly on a track, so that the sun's rays are always focussed upon the boilers. The steam thus generated goes to the engine which runs the apparatus. M. Mouchon is said to have constructed a really practical solar machine for the purpose of distilling water in regions where a supply for drinking cannot easily be obtained. The apparatus is portable, being carried on the back of a man without trouble. It will distil two and a half quarts an hour, or two gallons a day—enough to supply six or eight men. In Egypt, India, and certain other parts of the world, campaigning is rendered much more difficult by lack of drinking water, and a contrivance of this sort is likely to be of the utmost value, furnishing the essential fluid in a healthful state, and enabling the soldiers to cook their food rapidly. In some countries it is out of the question to get good drinking water. In Aden, for example, the sun always shines, and all water for drinking has to be distilled. Elaborate experiments with solar engines have been made by the French in Algeria, where the sun shines at all times and with great power. The best apparatus was found to be a simple arrangement of boiler and concave mirror, the steam generated being condensed in a coiled tube surrounded by water. This was for distilling water merely. In India an inventor named Adams has obtained very interesting results with machines of his own contrivance. One of these is a cooking box, made of wood, and lined with reflecting mirrors. At the bottom of the box is a small copper boiler, covered with glass to retain the heat of the rays concentrated by mirrors upon the boiler. In this contrivance any sort of food may be quickly cooked. If the steam is retained, the result is a stew or boil; if allowed to escape, it is a bake. The rations of seven men can be prepared in two hours, including meats. The heat may be augmented indefinitely by increasing the diameter of the box.—*Industrial World.*

Patent News.

THE following applications for Patents were made between September 29 and October 6, 1897:—

DEVELOPING BOXES.—No. 22,354. "Improvements in Developing Boxes for Developing Photographs without the Aid of a Dark Room." Communicated by W. Miller. W. P. THOMPSON.

EXHIBITING PHOTOGRAPHS.—No. 22,383. "An Improved Method of Exhibiting Photographs Applied to Candle and other Illuminant Screens." E. W. PORTER.

ANIMATED PHOTOGRAPHY.—No. 22,423. "Improvements in Apparatus or Machinery for Exhibiting, Taking, or Printing Moving or Animated Photographs." C. C. VEVERS.

FILMS.—No. 22,469. "Improvements in the Method of Arranging Cut Sensitised Films for Use in Photographic Cameras." A. L. ADAMS.

LANTERN OBJECTIVES.—No. 22,489. "Improvements in Flanges for Carrying Objectives in Optical Lanterns." A. WRENCH.

CHRONO-PHOTOGRAPHIC VIEWS.—No. 22,558. "An Improved Apparatus for Taking and Projecting 'Chrono-photographic Views.'" A. ELKAN and J. STERNBERG.

CAMERAS.—No. 22,620. "Improvements in and connected with Photographic Cameras." A. A. BEADLE and A. M. HAYWARD.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
18.....	Bradford Photo. Society	*Lantern-slide Making.* J. A. Hodges, F.R.P.S.
18.....	North Middlesex	*Platinotype Printing.* Henry Smith.
18.....	Richmond	*Hints on Lantern-slide Making.* The President.
18.....	South London	*Photographing Minute Objects.* T. E. Freshwater, F.R.M.S.—*The Working of Improved Cameras and Shutters.* Mr Scott.
19.....	Aintree	Lecture: *Treatment of Figures.*
19.....	Brixton and Clapham	Lantern Evening.
19.....	Gospel Oak	Film Demonstration W. J. Ramsey.
19.....	Hackney	Lecture: *Practical Hand-camera Work.*
19.....	Royal Photographic Society ...	*The Heliochrome Process, and its Application to Artistic and Commercial Illustration.* Paul L. Waterlow.
20.....	Borough Polytechnic	*Process Work for Amateurs.* William Gamble.
20.....	Coventry and Midland	Lantern Slides from Negatives taken by Members at the Summer Outings.
20.....	Croydon Camera Club	*Photographic Lenses.* Rev. F. C. Lambert, M.A.
20.....	Kingston-on-Thames	Beginners' Night: *Apparatus, Exposure and Development.*
20.....	Leeds Camera Club.....	Beginners' Night: II. *Subject and Exposure.* C. C. Vevers.
20.....	Leytonstone	*Cloud Photography.* A. Horsley Hinton.
20.....	Photographic Club	Discussion: *Which is the Best All-round Printing Process?*
20.....	Polytechnic	Slides. F. Parker.
20.....	Southport	*Practical Working of P.O.P.* Misses Hurst and Shawcross.
21.....	Bolton Mutual Photo. Society .	*Negative-making.* Messrs. Patterson and Rushton.
21.....	London and Provincial	Lantern Evening.
21.....	Manchester Amateur	Lantern-slide Testing Night.
21.....	Woodford	Annual Meeting.
22.....	Borough Polytechnic	*Lantern slide Making.* F. W. Bannister.
22.....	Croydon Microscopical	Trial Night: Members' Slides.
22.....	Wolverhampton	*Burns, Expectation and Realisation.* W Meikle.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 12.—Ordinary Meeting, the Earl of Crawford, K.T. (President), in the chair.

NEW MEMBERS.

Five new members were admitted, and thirty-three nominations of candidates for membership were read.

PRESENTATION OF MEDALS.

The President presented the medals which had been awarded to exhibitors at the current Exhibition as follows: Mr. J. H. Gear (No. 10, *The Receding Tide*); Mr. J. C. S. Mummery (No. 76, *The Landing-place*); Mr. W. Gill (No. 186, *A Pleasant Occupation*); Dr. Lindsay Johnson (No. 435, *The Normal Macula lutea in Man*); and Messrs. J. H. Dallmeyer, Limited (*The Stigmatic Lens f*·6). Medals had also been awarded to Messrs. Elliott & Son, Messrs. S. B. Bolas & Co., Mr. F. Marsh, and Mr. Harold Baker, but those gentlemen were not in attendance to receive them.

The PRESIDENT said that he would not venture, in presenting the medals, to say anything upon questions relating to art, but, in handing Mr. T. R. Dallmeyer the medal awarded to his firm for a scientific invention, he thought he might safely make some remarks. He then proceeded to describe the genesis and properties of the stigmatic lens, which have already been fully dealt with in our columns, and he said it was a source of considerable satisfaction that a medal should have been awarded for the production of a lens of so valuable a character, as the circumstance showed that the science of lens-inventing had not entirely departed from England. Although many of the great advances in optical science, so far as photography was concerned, had come from Germany, he felt confident that in this respect a brighter future was coming for this country.

Mr. DALLMEYER, in accepting the award, expressed his regret that Mr. Aldis, to whom the production of the lens was mainly due, was unable to be present.

THE PROGRESS MEDAL.

The PRESIDENT alluded to the fact that earlier in the year the Progress Medal of the Society had been awarded to Professor Gabriel Lippmann, for his researches in connexion with colour photography by the interference

method, and stated that, as Professor Lippmann's duties at the Sorbonne prevented his attendance, the Vicomte de Manneville, the First Secretary of the French Embassy, was present, at the direction of his Excellency the French Ambassador, to receive the medal on his behalf. The President recalled the subject-matter of Professor Lippmann's researches, which he described in some detail, and, in handing the medal to the Vicomte de Manneville, requested him to convey the cordial congratulations of the Society to their distinguished foreign member, and thanked him for attending the meeting and imparting a diplomatic air to the proceedings.

THE PRESIDENTIAL ADDRESS

was then delivered by the Earl of CRAWFORD. [See page 662.]

Mr. J. SPILLER, in proposing a hearty vote of thanks to the President for his address, said that, as a chemist for nearly half a century, he most strongly advocated the use of the metric system of weights and measures, which would abolish many of the difficulties attending the compounding of formulæ expressed according to the ordinary methods. He mentioned that in one of the photographic annuals, some years ago, he had pointed out the advantages of the metric system, and had referred to the fact that the English sovereign formed a very good substitute for a weight, as it weighed exactly eight grammes, the half-sovereign being equivalent to a four-gramme weight.

Mr. CHAPMAN JONES seconded the vote of thanks, which, having been put to the meeting, was carried by acclamation, and suitably acknowledged by the PRESIDENT.

THE SOCIETY'S MUSEUM.

Dr. LINDSAY JOHNSON said that in 1890 he visited Professor Lippmann's laboratory at the Sorbonne, when that gentleman showed him the results of his experiments in colour photography, and was kind enough to present him with one of the very first—if not actually the first—of his photographs in colour, and this interesting example he now offered to the Society as an addition to its museum.

The PRESIDENT, on behalf of the Society, expressed much pleasure in accepting Dr. Johnson's present, for which he tendered him very cordial thanks.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 7,—Mr. E. J. Wall in the chair.

Messrs. Louis Woolf and G. Pinker were elected members of the Association.

The CHAIRMAN welcomed, on behalf of the Association, several visitors present, amongst whom were Mr. Sydney Keith, who has photographed in all parts of the world, Mr. Thomas Fall, Mr. Lyell, of the Convention Council, Mr. P. R. Salmon, Mr. T. Morley Brook, of Manchester, and Mr. F. A. Bridge, the Secretary of the Photographic Club.

Mr. A. L. Henderson exhibited a very compact form of hand camera put upon the market by Messrs. Houghton & Son, of High Holborn, which he thought a very creditable piece of work and deserving of examination. It was furnished with the usual time and instantaneous shutter, a finder, and three neat little double dark slides. The camera was constructed for the use of plates of $1\frac{5}{8} \times 2\frac{1}{2}$ inches size, or the quarter of a quarter-plate.

Mr. HENDERSON proceeded to give his lantern lecture on

MERAN, SOUTH TYROL,

illustrated with about a hundred slides. Mountains and valleys, cathedral and street architecture, and snow effects comprised nearly the whole of the pictures shown, and Mr. Henderson remarked on the beneficial climate for invalids and the wealth of beautiful subjects for the camera to be found in the neighbourhood of Meran.

PHOTOGRAPHIC CLUB.

OCTOBER 6,—Mr. Alex. Mackie in the chair.

Mr. John Bushby, of Liverpool, was introduced by Mr. Child Bayley.

The subject for the evening was a discussion upon

HAS PHOTOGRAPHY BENEFITED BY THE SO-CALLED ARTISTIC ELEMENT?

but the remarks made were more in the direction of settling what artistic work really consisted in, and, as regards the whole question, the Club "got no forrarder." It was pretty generally admitted that any division into sharp and fuzzy schools was at the present day absurd, and that we had benefited to some extent by variety of treatment. It was pointed out by two or three members that an exhibition of the work shown ten or fifteen years ago would not be deemed good enough to compare with the present, and that therefore our ideas and tastes had risen, or, at least, altered, as evidenced by the improvement of the work. One member pointed out that the forewords of the Salon catalogue gave a definition of the artistic worker as one who should be capable of fixing the standard of his own work. The discussion was carried on chiefly by Messrs. FRY, FOXLEE, the CHAIRMAN, CHILD BAYLEY, and WELFORD, and ended in the usual fashion, of every one being convinced of being unconvinced.

Borough Polytechnic Photographic Society.—The past week has been a very busy one with this Society. On Saturday, October 2, nearly 100 members and friends attended a social evening, which was held in order to wind up the summer session, and to mark the commencement of a strong winter programme. A feature of the evening proceedings was a set of slides illustrating some of the doings of the Sidmouth holiday party, with a description by the Hon. Secretary. There was a capital attendance at the first Ordinary Meeting of the season, on Wednesday, October 6, when Mr. Charles L. BURDICK admirably demonstrated on

AËROGRAPH RETOUCHING WITH LIQUID COLOURS.

The invention is an American one, and consists of a simple, pencil-like arrangement to hold the colours, attached to a convenient length of rubber tubing from a cylinder into which air is pumped as required, the pressure being regulated by a gauge. The pressure of a small lever at the "pencil" instantly ejects a fine spray of colour, the flow of which can be decreased or increased by the aid of the same lever as found necessary. It is chiefly used for finishing bromide enlargements, but can be successfully employed on either the film or glass side of a negative. The first practical night, on Friday, October 8, was well supported, and several useful hints were obtained in bromide printing.

Croydon Camera Club.—The winter session was opened on Wednesday, October 6, by the PRESIDENT (Mr. Hector Maclean), with a short address upon

CURRENT PHOTOGRAPHY,

in the course of which he dwelt upon various items of interest to the practical photographer, including the dangers of some anti-halation precautions, the popularity of the gum-bichromate process, and the evidence of photographic achievements afforded by the exhibitions now open, these last remarks being illustrated by examples of several works kindly lent by their respective exhibitors. "The evil wrought from want of thought" was indicated by an extreme example of the fuzzy school, the original of which was hung at one of the exhibitions alluded to. As a wholesome antidote to the prevailing tendencies to "darkness and smudge," the President prescribed lantern slides, and added, "Show me a good slide-maker and I will show you a good photographer." After allusion to the decline of the pictorial slide, and offering some suggestions whereby the best class of photographers might be induced to resume their efforts to show pictures, as opposed to mere crude records, on the screen, he concluded by referring to their winter programme, which, amongst a host of other items, includes a lantern lecture upon *Wild Birds at Home*, by Reginald B. Lodge, and a demonstration of the great discovery in colour photography by the inventor of the instruments used, viz., Mr. F. E. Ives. The foregoing was followed by a lantern lecture on

PHOTOGRAPHIC ADVANCES,

by T. C. HEPWORTH, F.C.S. In this a swift glance was taken at the various steps, from Daguerreotype to dry plate, which mark the conquests of the camera, in the course of which such achievements as photo-engraving, both in line and in half-tone, moving photographs, stellar photography, the photography of X-ray images, and instantaneous exposures were interestingly illustrated and explained, especially appreciated being the photographic image of a bullet fired with full charge from a rifle, and photographed within a yard or two of the gun's muzzle; in this, not only the bullet is sharply rendered, but the plate also records the waves of condensed air set up by the projectile in the course of its flight. Mr. Carley showed some clever snapshots of the St. Augustine celebration at Ebb's Fleet, and also Jubilee Day at London Bridge; Mr. Kough a striking slide of Addington Jubilee bonfire all ablaze; and Mr. Maclean prints upon Benton's collodio-chloride paper, the tones of which were of a more than ordinarily pleasant hue.

Gospel Oak Photographic Society.—October 4.—The annual Social Evening was held in the lecture hall of the Gospel Oak Congregational Church, Southampton-road. In the first part of the programme songs were contributed by Miss Randall and Messrs. K. Gittens and T. Adams, and a recitation by Miss Brodie. In the interval refreshments were served under the management of Mesdames Hall, Palmer, and Rayner. The second part of the programme consisted of a very fine exhibition of lantern slides, kindly lent by Messrs. Thomas & Co., illustrating the beauties of some of our English cathedrals, followed by songs by Miss Randall and Mr. T. Adams, a recitation by Miss Brodie, and a violin solo by Miss Randall. At the conclusion of the proceedings a vote of thanks to the *artistes* and the ladies who had helped with the refreshments was proposed by Mr. RAYNER and seconded by Mr. SMITH.

Hackney Photographic Society.—October 5, Mr. Rawlings presiding.—A paper on

DEVELOPERS AND DEVELOPMENT,

by Mr. Ethelbert Henry, was read by Mr. A. BARKER. This most interesting subject was treated in a clear and thorough manner. The different developers were compared, and the characteristics of each separately dealt with. Many useful formulæ were given.

North Middlesex Photographic Society.—October 4, Mr. Mummery in the chair.—Mr. Mattocks showed a negative, the film of which had almost completely stripped. It had been intensified and treated with an alum bath, and only slightly washed afterwards. There was a powdery deposit on the glass where the film had stripped, which was supposed to be crystallised alum, and this was said to be the cause of the mishap. The Monthly Lantern-slide Competition brought out some slides of good quality, Mr. Crane gaining first place with *Autumn Haze*. Slides by Messrs. Rutt, Mummery, Mattocks, Pring, and Stuart were also added to the Society's collection. Before the lantern was put away a piece of a silvered lantern screen was tried, which gave a much brighter image than the ordinary screen, and was a decided improvement. In the Outings Competition Mr. Mummery wes placed first with a print in gum bichromate of *Strand-on-the-Green*. Messrs. Marchant and Smith tied for second place.

OCTOBER 11, Mr. Pither in the chair.—Mr. T. Bedding read a paper on

ANIMATED PHOTOGRAPHY.

In a very interesting lecture he gave a history of the subject, and told how before photography was used for this purpose, toys, such as the zoetrope and others, were in existence, which showed apparent motion in a series of pictures which were caused to pass before slits through which they were viewed. He described all the instruments in use at the present time, and said the fault that gave most trouble was the objectionable flicker which was very apparent in some instruments, but an improvement in that respect was now visible. A discussion took place, chiefly regarding the flickering, and several suggestions were made for overcoming it. A hearty vote of thanks to the lecturer concluded the meeting.

Richmond Camera Club.—The autumn session of the Club was opened on the 4th inst. by an exhibition of lantern slides, to which ladies were invited. Mr. Cembrano (the President) was in the chair, and the Masonic Hall at the

eyhound was well filled by members and their friends. The slides shown re a set by Mr. Payne Jennings, illustrating a trip to the Norfolk Broads d the scenery of the district, lent by the Great Eastern Railway Company. ey formed a very interesting series, but it must be said that the slides were mewhat unequal in quality—many were excellent, but some, especially in e first part of the lecture, could certainly be improved upon.

Tooting Graveney.—October 5.—That "go-ahead" railway company, the reat Eastern, having adopted the novel but practical idea of advertising by ie issue on loan of lantern slides representing the many points of interest in iat part of the country served by their system, a set, entitled *A Trip to armouth and Back*, was obtained from them and exhibited by Messrs. eckett and Simmonds. The slides, which were chiefly from negatives by the ell-known artist, Mr. Payne Jennings, were greatly admired. Mr. EDWARDS ntroduced the Cycloidoscope, an ingenious apparatus for tracing geometrical esigns on a disc of smoked glass placed in the lantern, a rotary motion being nparted to it by means of a pinion and cogwheel; the designs can be altered t will by adjustment of the tracing point. He followed this by introducing ves's Kromkcop, which is a device for exhibiting photographs in natural olours. According to the description it appears that three negatives are aken through red, blue, and green glasses respectively. From them transarencies are made, and by a very clever arrangement of these, backed by the espective coloured screens in a specially designed stereoscope containing eflectors, a combination results which is marvellously real, every colour and int being reproduced with great exactness.

Coventry and Midland Photographic Society.—Dr. Hall-Edwards, of Birmingham, who was one of the earliest in this country to investigate the power of the X rays, gave a practical demonstration in Coventry on Wednesday, October 6. Alderman Andrews (the President of the Society) occupied he chair. The lecturer commenced with an expression of pleasure at being ible to chat with his audience on what he described as one of the most wonderful discoveries of the century. The subject was not purely a photographic one, although he was there to lecture to a Photographic Society, but was only so indirectly. It was more an electrical matter than photographic, but in its science it was either. Dr. Hall-Edwards continued to explain the term "matter" as being scientifically something which had weight. So far back as 1816 there had been predicted a matter which would be as different as gas from liquid and liquid from solid. This had been termed radiant matter, and from this a new form of phenomena would come. This was not realised until 1874, when Professor Crookes discovered it. The lecturer next demonstrated the effect of electricity passing through a Crookes' tube, and showed some pretty coloured effects by the use of different kinds of glass. From the discovery by Crookes there were great possibilities, and X rays, the first possibility of radiant matter, were, he thought, as a mere child to what would be done in time to come, the lecturer incidentally mentioning the possibilities in the way of propulsion. Dr. Hall-Edwards continued to trace the progress of knowledge in the matter, until he came to Professor Röntgen's wonderful discovery, and, in regard to this, the lecturer said he had experimented with some thousands of substances, and there was not one that the rays could not go through. It would go through anything and everything. The ray was not a light ray, and there had been many theories as to what it was, and they would have to rest contented without the proof for the present. Dr. Hall-Edwards next proceeded to give his audience a description of the various apparatus required to produce the ray, illustrating his remarks by pointing to his own, which were before him, and following this by giving a general invitation to any one to be photographed by the process. The Mayor at once volunteered to have his hand radiographed, and the lecturer quickly did this, and almost as quickly produced a good negative, showing the bones of the hand, a ring, and several hard substances which had been placed under the hand. By the aid of a lantern manipulated by Messrs. A. B. Clarke and E. M. Iliffe, the lecturer had thrown on the screen many X-ray photographs produced by himself. These included purses, with the gold inside thrown distinctly into prominence; side by side came a picture of an ordinary exterior photograph and an X-ray interior of various objects. This was followed by a hand, round which were wound various pieces of wire; a Lee-Metford bullet; a lady's foot, showing, as the lecturer said, the effect of getting an eight-size foot in a two boot, and various other photographs of scientific interest. There were also several humorous sketches by the lecturer, based upon the absurd fallacies which got abroad on the discovery of X rays being made. One of these was named *A Masher of* 1902, and another of *Persimmon and his Trainer*. On the proposition of the Mayor, a vote of thanks was heartily passed to the lecturer for his interesting explanations and demonstrations. Dr. Hall-Edwards, in reply, said that the more he worked at these X rays the more he became absorbed in the subject. It would not, he thought, be a study which would, to any great extent, be taken up by amateur photographers. Its use to the scientific world was recognised, but it was now being used in other ways: for instance, he had often applied it for finding defects in bicycles and tyres, and he thought the ray would come largely in use for this kind of thing. He further mentioned one of the possibilities of the extension of the process in the way of wireless telegraphy, and remarked that, by the use of a screen, which he showed, he had succeeded in telegraphing a message through forty-five feet in his own house.

Rotherham Photographic Society.—October 5, Annual Meeting.—In the unavoidable absence of Dr. F. B. Judge Baldwin (President), Mr. E. Isle Hubbard, M.S.A. (Vice-President), occupied the chair. The annual report showed that the Society continued its prosperous career, the membership now standing at fifty-four. Increased attention to photographic survey work (the Society having adopted a scheme several years ago) was directed. The programme for the ensuing six months had been completed, and there was good expectation that it would prove of great interest and result in the imparting of much useful information. According to the financial statement, there was a balance in hand of 12*l*. Officers for the ensuing twelve months were chosen as under:—*President:* Dr. Baldwin.—*Vice Presidents:* Messrs. E. Isle Hubbard, J. Leadbeater, and J. Turner.—*Hon. Treasurer:* Mr. A. S. Lyth.—*Hon. Secretary:* Mr. H. C. Hemmingway, Grosvenor-terrace, Tooker-street, Rotherham. These gentlemen, with the following, constitute the *Council*, viz.: Messrs. C. E. Parkin (Assistant Secretary), R. H. Law, J. Clarke, F. Oldham, and F. Moore. Mr. W. Thomas's paper on *Hand-camera Work* (lent by the Affiliation of Photographic Societies) was afterwards read, and the accompanying slides and prints exhibited.

Sheffield Photographic Society.—October 5, Annual General Meeting.—As in former years, dinner was partaken of, after which an adjournment was made to the Society's room, when the chair was occupied by the President (Mr. Tomlinson). The Treasurer presented his report and statement of accounts, which showed a good balance in hand, and was unanimously adopted. The Secretary also read his annual report, and, after various matters had been discussed, the election of officers for the ensuing year was proceeded with, and resulted as follows:—*President:* Mr. George Tomlinson.—*Vice-Presidents:* Messrs. T. Firth, D. C. Brooke, and S. Camp.—*Council:* Messrs. W. T. Furniss, G. H. Day, H. Ellis, J. W. Charlesworth, and C. F. Brindley.—*Librarian:* Mr. T. G. Hibbert.—*Reporter:* Mr. J. H. Lygo.—*Treasurer and Assistant Secretary:* Mr. Joseph Smith.—*Secretary:* Mr. George W. Blackwell. Votes of thanks to the retiring officers concluded the meeting.

Edinburgh Photographic Society.—October 6, Mr James Patrick (President) in the chair.—In his opening address, Mr. PATRICK gave some good practical advice to photographers. He said the word "instantaneous" had a great fascination for some beginners; they made their exposures instantaneously whenever they possibly could. This was a great mistake, as so many subjects were so much better rendered by a slower exposure. For instance, in photographing breaking waves, a much better idea of motion was conveyed by giving a quick hand exposure than by giving a very short exposure with a shutter. The shutter exposure was apt to give the waves a frozen appearance. In speaking of the finished picture, Mr. Patrick held that, as retouching was very generally allowed on the negative, there was no reason why brush work to a certain extent should not be allowed on the print. In winter the truth in nature could be more nearly approached by the landscape photographer, as black-and-white scenes were so well suited to the camera. The Treasurer's report showed the financial affairs of the Society to be in a very good state. The number of members on the roll was over 400. Mr. W. D. MACKAY, R.S.A., gave a lecture on

THE FIGURE PAINTERS OF HOLLAND.

The lecture, which was much enjoyed, was illustrated by a large number of lantern slides.

FORTHCOMING EXHIBITIONS.

1897.	
October 15–Nov.....	Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 15–Nov. 13 .	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
November 1–6.....	Brixton and Clapham Camera Club. C. F. Archer, 1, Gauden-road, Clapham, S.W.
,, 16–18	Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.
,, 22–27	Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.
December 9–11	Aintree Photographic Society.
1898.	
January 17–22.....	Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
January–February...	Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30	National Photographic and Allied Trades Exhibition. A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14.....	International Photographic Exhibition (Crystal Palace). R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—Replying to the letter of "Grateful," in your issue of October 8, I can assure him and assistants generally that my information was based upon actual facts, and, being at one time one of the unlucky individuals who gave up a good situation, have good cause for complaint. "Assistant's" troubles of the first were in fact similar; probably he was engaged by the same firm as the one in question. It is no easy task for an assistant to find sufficient cash to travel a long journey out of London, and at the termination of a fortnight to return or have wages reduced (no railway fare is allowed).

I should like to see a movement pushed forward whereby all nigger-driving firms may be made known to assistants generally. As

we have no union amongst ourselves, it may be possible for the JOURNAL office to keep a list of such firms (providing the names of such firms are verified by at least two complainants), and such lists might be forwarded to assistants on application. I leave this suggestion to some energetic person to place it on a working principle. I enclose you the name of the firm alluded to, which you are at liberty to publish, together with my name, should you feel so disposed.—I am, yours, &c., CRITIC.

October 10, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

Miss Lillias Hamilton, M.D., 1 Barn-street, Ayr.—*Photograph of His Majesty the Ameer of Afghanistan. Photograph of His Royal Highness Prince Habibullah, Khan of Afghanistan.*

RECEIVED.—T. J. BRIANT; J. LEWIS; T. C. NEVRÉ; and others. In our next.

F. DUNSTERVILLE (Madras).—Many thanks; it will do admirably.

ARTISTIC LIGHTING.—Of the Photo Beacon Company, Chicago, U.S.A. Price one dollar.

OMEGA.—*Collotype*, by Dr. Schnauss, published by Iliffe & Son, St. Brlde-street, E.C.

J. W. W.—The initials probably stand for G. W. Wilson & Co., Aberdeen. Forward us a stamped letter and we will address it to the gentleman named.

APPRENTICE and others have not enclosed their names and addresses; hence, according to our rules, their communications have been consigned to our waste-paper basket.

FRILLING.—T. BIDWELL. If the frilling is so slight, it may, doubtless, be avoided by just rubbing round the edges of the glass and film with a paraffin candle or the finger charged with tallow.

IDENTITY OF PROCESS.—The print somewhat resembles a collotype. A solution of bichloride of mercury applied to the surface of one of the prints will settle the dispute between you and your friend. If the print bleaches, it is obviously a silver print.

ALBUMEN PAPER.—H. HARRIS. Both the brands of paper mentioned are American and are not stocked here by any of the dealers, hence you will have to procure them direct from the States. Anthony's or the Scovill Company will, doubtless, supply them.

DRY PLATES.—IMPECUNIOUS AMATEUR. You would certainly find it false economy to prepare your own plates instead of buying them. We very much surmise, in purchasing your glass in small quantities at a time, you would find that it costs nearly, if not quite, what you can get the plates for. If you want to make your own plates for experimental purposes, the difference in cost is not a matter of consideration.

MOUNTING.—MR. H. W. BIBBS writes: "*Re* Mr. E. Penfold's query. If he will use the paper that Messrs. Cadett & Neall wrap their plates in to rub down with, he will be all right. It is a kind of tough glossy tissue paper. If the paper sticks slightly, turn up at one corner and drag along the print, but do not lift up. Place a sheet of blotting or other paper on top of the tissue to form a pad, and rub down."

BOOK ON PHOTOGRAPHIC CHEMISTRY.—F. G. WILLATT says: "Will you please name a good work on photographic chemistry? I have Attfield's *Pharmaceutical Chemistry*, but want one relating more to photographic matters."—In reply: There is no single good book entirely devoted to the subject. Leaper's *Materia Photographica*, Abney's *Instructions*, and Wall's *Dictionary* between them might supply your requirements.

SALARY.—BADLY TREATED. The only remedy you have is to sue for the wages actually due in the County Court. As there was only a verbal agreement, you can do nothing else. Probably, if you issue a summons for that amount, it will be paid into court and thus save you further trouble. Yours seems to be a hard case, but there are many similar ones where verbal agreements are relied upon. We have heard of your employers before.

D. K.—1. The bills would be "protested," that is, the fact of their not being met would be noted. The holder could then proceed in the County Court and recover in the usual way, the bills constituting an *ipso facto* proof of debt. 2. So far as we can judge, you would have a good ground for action against the man for misrepresenting the value of the business. We advise you, however, to be guided entirely by legal advice in the matter.

FLARE SPOT.—F. SNELLING writes: "I have a lens by ——. When I give more than one-fifth of a second exposure out of doors, there is, five times out of six, a flare spot. Kindly say, in your Answers to Correspondents, what is the best way to 'dodge' this fault in the printing."—If it is really a flare spot, there is no successful way of dodging it in the printing. The lens should be returned to the makers for exchange or correction, as it is faulty.

BLINDS FOR STUDIO.—T. SNOW. The material will do very well for the blinds for the north side of the studio, but it will be better to have darker for the south side. The same material will answer, but get it much darker, and, if possible, thicker, to combat the summer sun.

SPURIOUS PLATINOTYPES.—PROVINCE writes: "Is it true that many London photographers are turning out bromides as platinotypes and charging the extra price for them? I have recently been shown some that seem very doubtful."—We do not think that *many* London photographers do so, but we fear that some do, and it is a fraud. The fraud may, however, easily be detected. If the fraudulent print be immersed in a solution of bichloride of mercury, the image will disappear; not so with a platinotype.

DARK-ROOM WINDOW.—RESUSCITATED AMATEUR says: "After giving up photography for over twenty years, I think of having a go at it again with gelatine plates; but is it really necessary to have the dark-room window glazed with dark ruby glass? Will not the orange cambric that was used in the collodion days do if I use a couple of thicknesses more?"—No, not if you employ very sensitive plates. You can, however, obtain deep orange glass that will be perfectly safe, except with orthochromatic plates.

STUDIO.—S. R. W. The design for the studio cannot well be improved upon except that, for general professional work, two or three feet more in its length would at times be a convenience. With regard to the second part of the query, we are very doubtful if the local authorities will allow its erection, unless the major portion of it is of brickwork. Such a structure, in such a situation, would certainly not be permitted in the metropolis, as it would contravene the Metropolitan Building Act. However, that may not apply in your locality.

INTERIOR.—W. & Co. say: "We have to photograph the interior of a large room—a fancy bazaar—next week. The light is fairly good from six side windows and a skylight, and there is a large window at the end which, we fear, will give some trouble, as it cannot be darkened. Can you give us some hint as to exposure and how to proceed?"—The best practical hint we can give is to go the day before and expose a plate or a couple with different timing, and judge from the results the exposure necessary for the picture. Also back the plates, to prevent halation from the windows.

ENAMEL COLLODION.—D. U. S. asks: "Will you kindly inform me, through your Correspondence column, the correct way of using collodion for enamelling, giving the formula for mixing the collodion," &c.—A good enamel collodion is made by dissolving half an ounce of pyroxyline in a mixture of one pint of sulphuric ether and one pint of alcohol, then adding a drachm or drachm and a half, according to the character of the pyroxyline, of castor oil. To give details of the method of enamelling the prints would take up more space than can be accorded in this column. We refer our correspondent to the ALMANAC for 1896, where he will find two or three articles on the subject.

RETOUCHING AT NIGHT.—RETOUCHER writes as follows: "I have an engagement as retoucher, but wages are so small that I can scarcely get along upon them. I am offered some work to do at home at night if I can undertake it. Can you tell me the best kind of light to use, as I naturally do not want to try my eyes more than I can help? I may say that gas is not available"—We can suggest nothing better than a good paraffin lamp, but two or more thicknesses of ground glass should be interposed between the light and the negative, so that it appears to be illuminated, as it were, by a white cloud. With a suitable arrangement of this kind the eyes need not be unduly tried.

EUREKA.—W. H. WALMSLEY writes: "In your Supplement of September 3 is a rather extraordinary paragraph in reference to an alleged production of a gas, named Eureka, from a mixture of calcium carbide, lime, and colophony, with some wonderful claims as to its qualities and cheapness. Had this appeared in any of the ordinary secular journals, I should not have given it a moment's thought, but seeing it in the pages of your respected JOURNAL makes it impossible to dismiss it in so summary a manner. May I ask you if any more detailed account of it is to be had, and what you think of the claim made?"—In reply: We have no other information on the subject. The news came from a fairly reliable source. We will endeavour to procure further particulars.

LANTERN.—S. TODD writes as follows: "I have bought one of ——'s lanterns to amuse my youngsters and their little friends with this winter. It has a three-wick lamp, but the smell from it is at times quite unbearable; at others, there seems none at all. Can you account for it, as I always use the same oil, refined kerosine?"—We do not think the lamp is at fault; but several things may account for the smell. Badly trimmed wicks will do so, or their not being properly adjusted; the burners being dirty will also do so, so will oil on the outside of them, or the reservoir. See that the wicks are even, and wipe off all oil from the burners and from the outside of the lamp with a clean, dry rag each time before lighting, and we have little doubt the annoyance will be got rid of.

AIR BUBBLES IN LENS.—W. RUSSELL writes: "Wishing to possess a lens of the greatest perfection, I have obtained one of the latest construction from one of the German opticians, direct. It is one of their latest inventions, and has been greatly extolled in the English and foreign photographic press. Judge of my surprise, on unpacking it, to find that there are several air bubbles in the glass! Is it not too bad for the inventors to treat English customers, who have remitted cash, like this? What would you advise me to do under the circumstances?"—Use the lens, and you will, doubtless, find it an excellent instrument. The bubbles will do no harm whatever. With some kinds of the new Jena glass it is impossible to avoid them. Probably, if you refer to the optician's catalogue, you will find a note to that effect.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1955. Vol. XLIV.—OCTOBER 22, 1897.

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THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1898.

The thirty-seventh issue of The British Journal Photographic Almanac will be published on December 1 next. It is in course of preparation. The reception accorded to the volume for 1897 was most gratifying, and is an inducement to us to produce its successor on lines that met with such marked appreciation.

We have always welcomed the co-operation of our friends and readers in our task, and, as hitherto, the Editor will be pleased to receive short contributions on subjects of practical interest for inclusion in the pages of the Almanac. The processes of modern photography are so many and varied, that there are probably few workers who are not in a position to communicate some useful hint or suggestion for the benefit of their fellow photographers. The early receipt of the articles and any accompanying sketches will be greatly esteemed.

To Secretaries of Societies we shall be much obliged if they will forward us lists of officers and other details for inclusion in the Directory of Photographic Societies, at the earliest possible date. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade.

A section of the Almanac is devoted to notices of the latest introductions in photographic apparatus. Those firms who desire to take advantage of this feature will oblige us by communicating with us forthwith.

The Publishers wish us to remind Advertisers that most of the advertisement pages of the Almanac are already booked, and that, to insure insertion and good positions, orders and copy should reach them by Tuesday next, October 26.

EX CATHEDRA.

On Tuesday, November 2, a Special General Meeting of the Royal Photographic Society will be held, at which the rules of the Society, as they have been revised by the Council, will be submitted for the discussion and approval of members. To comply with the requirements of the case, a second Special General Meeting, for confirmatory purposes, will also have to be held a fortnight or so after the first. It may be remembered that for two years past it has been sought by a certain section of the Society to introduce a rule whereby a constant stream of "new blood" on to the Council shall be assured. Various minor improvements and alterations in several of the other rules also appeared desirable, and thus the whole subject was some months ago referred to the Council, who, in Committee, effected such revisions as seemed necessary.

* * *

It will be found, upon examination and comparison, that the suggested alterations are not of vital importance. We shall be surprised if they are not, with one exception, accepted without discussion. The exception, of course, is the particular rule rendering it necessary that, if in the Council election there are not sufficient natural vacancies to give the "new blood" the opportunity of asserting itself, the required number of old Councillors shall be compulsorily retired for a year. Over this rule, amended as indicated, there may be a contest. We sincerely trust that the meeting of November 2 will settle the whole of the Society's rules once and for all. The subject has for years past led to a shocking waste of time, wholly incommensurate with its importance, and has alienated many good men from the Society. We earnestly advise the members to insist upon the settlement of the matter forthwith, and thus remove from the Society the not wholly un-

deserved reproof that it gives too much attention to the unprofitable subject of the "tinkering of the rules."

* * *

THE Comptroller-General of Patents, Designs, and Trade Marks has sent us a specimen volume of a series of classified abridgments, covering all photographic inventions patented during the period A.D. 1884–8, recently published at the Patent Office (price 1s. each, including inland postage), and shortly to be followed by similar series for the periods A.D. 1889-92 and A.D. 1893–6. These volumes should be in the possession of all those directly or indirectly interested in photographic patents, as they are extremely valuable for reference and consultation where the protection of an invention is in contemplation.

* * *

THE Comptroller points out, in language almost identical with that which we have many times used in relation to this subject, that the patent laws of this country make no provision for an official search as regards novelty, and that all patents are taken out at the risk of the inventors. It is, therefore, incumbent on any person desiring to obtain a valid patent for an invention, either to cause a search to be made, or himself to make a search, as to the novelty of his invention. By omitting such a search, many a patentee has found, after paying his fees, that his patent is worthless, because it has been anticipated. Of course, in this case, the first applicant or patentee possesses all the patent rights, and the second one has absolutely no rights at all.

* * *

A COMPLETE and exhaustive search through published specifications of patents is a task of considerable difficulty, even for the trained expert, with all the resources of the Patent Office Library, for at this moment the number of printed specifications of patents is well over a quarter of a million. A series of indices and abridgments has been published by the Patent Office as a guide to the specifications themselves, and is distributed to the principal public libraries in this country. The abridgments give a general description of the nature of every invention patented, and the object of their publication is to enable the would-be patentee to carry out, at any rate in some cases, what may be termed a fireside search. By the study of these abridgments he will generally be able to select certain inventions which have already been patented, and which resemble his own invention sufficiently to render it desirable for him to examine their specifications in detail.

* * *

WE congratulate the authorities of the Patent Office on giving publicity to this information. The more widely it is known the better. The Patent Office, as pointed out above, does not, and cannot, give a guarantee against anticipation in the patenting of inventions, but it is within its scope to afford would-be patentees the greatest facilities in searching the official records of previous patents, and we are glad that the new Comptroller-General is endeavouring to make the existence of these facilities as widely known as possible.

* * *

OUR *confrère*, Mr. Dundas Todd, the editor of the *Photo Beacon* (Chicago), sends us the following interesting note relating to the suggested exchange of portrait photographs for exhibition purposes by English and American photographers: "Possibly Mr. H. P. Robinson may have told you that I had selected a number of pictures from our National Convention, and sent them across to the Salon, as illustrative of the present tendency of photographic portraiture in this country. There is quite an art movement afoot here, thanks principally to Mr. Inglis's teaching in lighting, and I want to keep the old country —I am still a British subject—*en rapport* with our ideas here. The American people are go-ahead once they catch on to an idea. All they need is a leader, and that I have been foolhardy enough to provide in my own body. I am more than surprised at the change here in the past year, and I hope to have the pleasure for some years to come to send across specimens of work from our annual Convention. Now, I would like immensely if the courtesy could be reciprocated. Could somebody on your side, in touch with the professionals, send me each spring samples of British work? You might look into this, and see what you can do." The American portraiture at the Salon, like the home productions, has the misfortune to be eclipsed in present interest by the bichromated gum pictures that abound in the Exhibition, but it is, nevertheless, very beautiful, and scarcely inferior in excellence of artistic quality to the best British work. We think it would be an excellent thing if Mr. Dundas Todd's courtesy could be reciprocated, and we shall be happy to assist in furthering his suggestion that a representative collection of British portraiture should be gathered and transmitted for exhibition presumably at the meeting of the American Convention in July next.

* * *

WE are glad to learn that the Glasgow International Photographic Exhibition, which closed last week, was a thorough success from beginning to end. The Hon. Treasurer, Mr. W. J. B. Halley, has been good enough to supply us with the following notes on the subject: "We have 'dropped the shutter' on our Exhibition, and the development has been very successful. I thought that some statistics of attendance and drawings might interest you. From the first it caught on with the public, and gained steadily every day, until latterly we were unable to accommodate the numbers that flocked to us nightly for its last fortnight. We had to display a large poster in the vestibule, 'Standing room only in lecture hall,' every evening shortly after the doors were opened, and one night I noticed particularly it only took ten minutes to occupy every seat we had; still we drew as much for 'standing room only' as what was seated. Many are now regretting its close (not I, however), as it filled up a pleasant evening, which will be difficult to replace. One marked feature of our attendance was the *first*-class audience; rarely did we see any working people, all being of the better and middle class."

* * *

THE following statistics of the Exhibition, for which we are also indebted to Mr. Halley, are extremely interesting. They must make many a southern exhibition executive envy such a magnificent record:—

Exhibition open thirty-seven days.

Day visitors, 4500.
Evening ditto, 24,000.
Total ditto, about 30,000.
Lowest day's drawings (first day), 13*l.*
Highest ditto ditto (fourth last day), 105*l.*
Lowest evening's drawings, 10*l.*
Highest evening's drawings, 70*l.*
Lowest day's attendance, 300.
Highest ditto ditto, 2500.
Average daily drawings, 35*l.*
Total ditto ditto, 1300*l.*
Estimated surplus, 500*l.*
Surplus of last Exhibition, 1891, 250*l.*

We heartily congratulate our Glasgow friends on this really splendid outcome of their labours. What changes photography may have in store for us during the next six years it is hard to tell, but it needs no gift of prophecy to anticipate that, if, in 1903, the Glasgow photographers unite in holding another International Exhibition, the traditions of their past successes will stimulate them to even greater triumphs.

ACETYLENE AND FIRE INSURANCE.

We desire again to approach a subject which, in view of the growing interest it is arousing and the promise it foreshadows of future importance, is of prime interest to a large number of photographers. At a recent metropolitan photographic meeting it was stated that the fire insurance companies permitted the use of a small generator of a certain type on insured premises, provided that it did not hold more than four pounds of calcium carbide, and in our Lantern Supplement is a letter from a manufacturer, in which he states that "there are practically no restrictions on the use of this beautiful light." Now, we should be guilty of a dereliction of duty if we permitted statements of this kind to be made in these pages if they were not thoroughly well grounded, and we have taken steps to ascertain the exact bearing of the matter. As a matter of fact, if any one will examine an ordinary fire insurance policy, he will find that there is no reference whatever to acetylene gas on its face, and hence it might be argued he would be free to use the gas. But that would be a very unsafe assumption, and, before proceeding further, we draw our readers' attention to the two first clauses in a fire-insurance policy, taken at random. They have all a strong family likeness. The italics are our own :—

> "Any material misdescription of any of the property expressed to be hereby insured, or of any building or place in which any of the property is hereby stated to be, or any omission to state the existence of any hazardous trade, or *of any apparatus in or by which heat is produced other than grates in common fireplaces* therein, or any misstatement of or omission to state any fact material to be known for estimating the risk, whether *existing at the time of effecting the insurance or afterwards*, renders this Policy void as to the property affected by such misdescription, misstatement, or omission respectively.
>
> "If, *after the insurance has been effected, anything whereby the danger of loss or damage to any of the property insured is increased* be done thereto, or to or upon or in any building or place in which any of the said property is contained, or if any property hereby insured be removed from the building or place in which it is herein described as being contained, *or if any addition to the risk arise from any other cause whatsoever, without*, in each and every of such cases, *the assent and sanction of the Company*, signified by endorsement hereon, or if the Insured shall refuse or neglect to pay any further premium which may be demanded in consequence of any increase of risk, the insurance as to the property affected thereby shall cease to attach. If a building, or any part thereof, shall fall except as a result of fire, all insurance by this Company on it or its contents shall immediately cease and determine."

It is perfectly clear from this that, if acetylene gas is to be accounted as an additional risk, any one using it or making it on his premises forfeits all rights under his policy; in fact, the policy becomes on the spot so much waste paper.

Hence it would be an act of unpardonable folly for any one to start the manufacture and use, in quantities however small, of acetylene without first ascertaining the views of the office in which he is insured. We have before us as we write letters from thirty of the largest insurance companies in the kingdom, written in answer to an inquiry sent to each as to the position they took in regard to acetylene, their answers to be for publication. With the exception of a few who regard their rules with an absurd secrecy, and decline to commit themselves or publish their rules, the position taken is really unanimous, and is a variation or a verbatim copy of the following rules :—

In all risks in which gas is allowed either with or without an extra charge, the use of acetylene gas for illuminating purposes be also allowed on the same terms, but subject to the following restrictions, which must be the subject of warranties.

1. That the storage of calcium carbide, liquid acetylene, and or acetylene gas, and every apparatus, whether portable or otherwise, for the generation of such gas, must be only in a building detached at least ten feet at the nearest point from every other building.
2. That suitable valves or devices for controlling the pressure of the gas must be placed inside the detached building, and a cut-off provided between such building and the building supplied with the gas.
3. That, in addition to the above, the piping in the building in which the gas is used must be provided with a pipe outlet into the open air controlled by a safety device so arranged as to let the gas escape outside the building whenever the pressure of the gas exceeds four ounces to the square inch.
4. That, pending further notice, in cases where the aforesaid conditions cannot be complied with, offices be at liberty to allow traders in acetylene-gas apparatus and calcium carbide to have upon their premises apparatus, whether portable or otherwise, for the generation of the gas, and a quantity of carbide sufficient for one day's supply, but not exceeding four pounds, kept in hermetically closed packages not containing more than two pounds each, and warranted ninety-eight per cent. pure.
5. That liquid acetylene be in no case permitted to be made, used, or stored upon the premises.

We call attention to Rule 4, which is evidently the ground for the statement made at the meeting referred to, but which has, as a moment's inspection will show, only a most limited application, as it is only traders in the gas who may use it, and they must first apply for and obtain permission.

We trust that we have now made it perfectly clear that any one who uses acetylene gas could not legally claim compensation in case of fire, and that such use would void his policy.

Finally, we may explain that the policy of all the "tariff offices" with regard to acetylene, and all other subjects indeed, is in accordance with a set of conditions laid down by what might be termed the parliament of the insurance companies, technically known as the "Fire Offices Committee." The conditions given above, we may state, are practically the conditions the Fire Offices Committee lay down, and no tariff office dare depart from them. As a last word, however, we may say that this Committee will shortly have a fresh pronouncement to make on the subject of acetylene, and we may hope that the rules at present in force may be relaxed to a considerable extent.

DEVELOPERS.

THE interesting lecture on *Some Little-known Developers*, given by Mr. Edwin Banks before the London and Provincial Photographic Association, affords subject for much thoughtful consideration. Although it is quite true as the lecturer remarked, that we have an almost unlimited choice of developers at the present day and do not require any new ones unless they are better than what we already have, still it is not impossible that some of the comparatively unknown or unused reducing agents mentioned by him as well as others that have been tried and relinquished in past times, may prove in the light of later knowledge to have some practical applications. There is, at any rate, still an opening for a developer of higher power than we now possess, one that will realise the dream of years ago of a simply momentary exposure in any light, however poor. So far as instantaneous photography goes, our plates and developers have reached such a pitch of excellence and rapidity that it would almost seem ungrateful to ask for more speed, but the fact remains, nevertheless, that occasions frequently arise when the highest sensitiveness at command is altogether inadequate.

Some years ago—in 1879, we believe—the late Mr. M. Carey Lea published in these columns an elaborate summary of a voluminous series of experiments he had made in connexion with a very large number of new, or hitherto unknown, developing agents, both organic and inorganic; and, as a measure of the utility of such investigations, it may be pointed out that the ferrous-oxalate developer was the direct outcome of that particular series of researches, the only one considered of any practical utility out of a very large number of substances tried, but surely a sufficient recompense to the indefatigable investigator for his trouble. Incidentally, too, we may mention a circumstance that is probably well-nigh forgotten at the present day, namely, that ferrous oxalate as a developer was independently "discovered" by two different individuals, almost if not actually simultaneously. To Carey Lea is undoubtedly due the credit of prior publication, but it is on record that Mr. William Willis, the inventor of platinotype, had not only discovered its developing powers, but had communicated the formula to the late Mr. Traill Taylor some time previously.

It was, no doubt, in connexion with his experiments in the platinum process, in which, as is well known, ferrous oxalate, formed by the reduction of the ferric salt under the action of light, brings about the development of the platinum image, that the idea occurred to Mr. Willis of applying that reducing power to the development of a silver image for negative purposes. At any rate, he tried the experiment and found it successful, and communicated the result as well as the details of the process to Mr. Taylor on the eve of his departure on a business trip to the States in 1878, begging Mr. Taylor to keep the matter to himself until his return, as he had some improvements in view. Meanwhile, during his absence, Mr. Carey Lea's communication of the process to our pages took place, and, though the two had undoubtedly, unknown to one another, been working simultaneously on the same lines, by the merest accident in the world priority of publication fell to the lot of Carey Lea instead of to Willis, though the credit is none the less due to the latter.

Carey Lea gave attention to a large number of the other ferrous salts, chiefly those of an organic character, but with the exception of the oxalate none at that time appeared to offer any results that placed them in the position of serious rivals of pyro, which at that period held the field alone for dry plates. Amongst the most promising of the ferrous salts dealt with were the borate, citrate, tartrate, and sulphite. The first, although presenting no special features of excellence, was the one which came nearest to the oxalate in general characteristics. The citrate, though inferior, so far as these experiments went, was subsequently found to form a most excellent developer for chloride plates, and we remember a most remarkable series of results obtained by its means that were sent to the country by Dr. Eder in 1880, as well as others produced about the same period by Mr. A. Cowan. With regard to the tartrate, although it did not at that time prove to be of much practical value, Mr. Carey Lea threw out a suggestion which even now might be worth following up. It is well known that the salts of iron in the presence of tartaric and citric acids, but more especially the former, are not precipitated on the addition of an alkali; and Mr. Carey Lea, bearing this in view and from something in the behaviour of ferrous tartrate, was led to throw out the suggestion that it might not be impossible to devise a developer with ferrous tartrate as the basis that should combine the functions of a chemical with a physical developer—in other words, a developer which should be not only capable of reducing the bromide of silver in the film as alkaline pyro and ferrous oxalate do, but should also, either simultaneously or successively, deposit additional silver on the metal so reduced in the same manner as the iron or pyro developers used for wet plates and for intensification.

Many years have passed since that suggestion was made, but, so far, nothing appears to have come of it, but the prospect held out is certainly an alluring one if it could be carried out. We have the methods of intensification introduced by Howard Farmer, and improved by J. B. B. Wellington, in which bromide or nitrate of silver, held in solution by hypo or sulphocyanide of ammonium, is deposited on the developed image by alkaline pyro. This mixture constitutes a developer having the characteristics suggested by Carey Lea, but unfortunately supplemented by the additional power of fixing the plate, which practically deprives it of its utility as a developer; but, if a stainless developer, such as ferrous tartrate may be supposed to form, could be combined with a silver salt without the intervention of the fixing agent, we should have a combination which would develop and intensify simultaneously and which would seem to offer special promise of utility in many directions.

As regards sulphite of iron, we are not quite clear, speaking from recollection, whether Carey Lea used it alone or in conjunction with oxalate of potash as the solvent, in which case probably the developing action would be as much due to ferrous oxalate as to the sulphite. Ferrous sulphite is insoluble in water, but dissolves easily in aqueous sulphurous acid, forming an emerald green solution, in which condition we have used it successfully as a developer for transparencies as well as prints, and with correct exposure it gives the most exquisite "Bartolozzi" red tones. It would, no doubt, have come more into vogue were it not for the difficulty of preparation. We have had no experience with commercial ferrous sulphite, though we see it in the price-lists of manufacturing chemists, but should have doubts as to its ready solubility, though it is easily soluble when freshly made, the following being the plan we have ourselves followed, though, it must be confessed, it is a somewhat troublesome process, especially to those unaccustomed to chemical manipulation.

Hot concentrated solutions of ferrous sulphate and sodium

carbonate are mixed in a capacious glass flask or wide-mouthed bottle. This results in a jelly-like mass of carbonate of iron, white at first, but quickly turning green, and, if exposed to the air, changing to dirty reddish-brown by oxidation. It is hopeless to attempt to wash or filter this mass, so the best way is to ignore the sulphate of soda it contains, and proceed to convert the carbonate into sulphite. The strongest aqueous sulphurous acid will only result in a very weak solution, so the better plan is to pass a stream of sulphurous acid gas into the vessel containing the "jelly" until it just becomes liquid, and then gradually clears.

To carry out this operation will necessitate an apparatus for generating the gas; this may consist of a pickle bottle, failing any better vessel, with a well-fitting bung, perforated with two holes, into one of which is fitted a bent-glass tube to lead the gas into the vessel containing the carbonate, and into the other a small glass funnel. A piece of stick or cane should be sharpened to fit into the neck of the funnel and act as a stopper, or a proper "separating" funnel, provided with a tap, can be obtained at the operative chemists's for a small sum. Into the pickle jar throw a quantity of crystals of sulphite of soda, or, cheaper, hypo, and in the funnel place a small quantity of hydrochloric, nitric, or sulphuric acid, which is to be allowed to dribble, a very little at a time, into the crystals. A vigorous evolution of sulphurous acid gas will ensue, and this must be led, by means of the bent tube, into the ferrous carbonate, which must be kept well stirred. It will be advisable to conduct the operation out of doors, or somewhere where the fumes will not be offensive, as it will be impossible to prevent some of the gas escaping; and, though it is an excellent disinfectant, it is apt to be pungent. This must be continued, replenishing the hypo and acid as required, until the jelly of carbonate of iron is converted into sulphite, and eventually dissolved, when it may be filtered and bottled for use. It keeps well in solution owing to its acid condition, and may be diluted "to taste" for use.

Another form of developer mentioned by Mr. Banks is given as chloride or bromide of copper, though he points out that the developing action is due to the cuprous oxide. The presence of the chlorine and bromine fully suffice to account for the disappearance of the image after development, as mentioned by him. This is another of Carey Lea's developers; but his method of preparation, if we remember rightly, was to dissolve ordinary oxide of copper in ammonia, and digest the solution with copper filings until it became colourless, in which form it constituted the developer when properly diluted. Its weak point was, we believe, its unmanageableness.

Value of Photographs in a Prospectus.—Photography is often made to lie, and lie like truth, too, very frequently. At the Mansion House one day last week, in the case of the prosecution of a number of persons for alleged fraud in connexion with the formation of a pianoforte-manufacturing company, one of the witnesses, looking at a photograph of the works that appeared in the prospectus, said the timber shown there belonged to him, and had nothing to do with the pianoforte business. Another stack depicted there was the property of a timber merchant next door. Any one looking at such photographs as these in the prospectus of a company would naturally take them, as many did, as showing the extent of the manufactory and the stock of material in store. The photograph itself was truthful enough in this instance, but it was put to a misleading purpose. The stacks of timber were there, but they belonged to other people.

The Working Life of a Cinematograph Film.—Under this title *La Nature* has some striking remarks upon a little-thought-of subject—the efforts and work actually spent in obtaining an often ephemeral result, and cites the cinematograph film as a case in point. In a kinetoscope each of the views that pass before the spectator's eye is only lighted, and consequently utilised, for about the $\frac{1}{1000}$ of a second. Now, seeing that each film may be used, say, 4000 to 5000 times before becoming unserviceable, it follows that the real active life of each view is less than a second of time. In the cinematograph the pellicle is illuminated for a longer period, about $\frac{2}{45}$ of a second, seeing that they pass at the rate of about fifteen per second, and each one is exposed for two-thirds of $\frac{1}{15}$ of a second. Further, because of the jerky movement of the film, it cannot pass through the instrument beyond 300 times without being damaged too much for further use. In consequence, its actual life is about a second and a third, less, in fact, than that of a piece of fireworks, which has an existence of several seconds.

A Carbide of Calcium Manufactory.—*La Nature* has a very interesting illustrated article on the calcium carbide manufactory of Notre Dame de Briançon in the valley of the Isère. The electricity required for producing this long-sought-for light accumulator, as it has been called, is generated by the aid of water power, upwards of 500 metres of a fall being available. The interior of the works is cut up with railways, and every convenience made for the packing and dispatching of the carbide. The water is conveyed through culverts resting on the ground, or carried in supports many feet above for a distance little short of a mile, all the work in connexion with it having been done in three months. It is evident, from the extent of the works being constructed here and elsewhere, that the acetylene-gas industry will, at no distant period, be a large and most important one.

Picture Galleries on Sundays.—Nothing shows so well how the Sunday opening of the museums and national picture galleries is appreciated as the return of the numbers of those who visit them on that day. The National Portrait Gallery, which was open on Sundays from April 14 to September 26, was visited by 13,683 persons. The Tate Gallery, which was open only from August 22 to September 26, had no less than 19,955 Sunday visitors. When nearly twenty thousand people visit an art gallery in six days, it shows how pictures are appreciated by the public, and how they avail themselves of the opportunity of seeing them afforded by the Sunday opening of the galleries. It must be borne in mind that the galleries were only open for a few hours in the afternoon; but, if they had been open also in the morning, there is no question that the numbers would have been very much larger than those stated. Possibly, however, as the opening of the galleries for the few hours in the afternoons has been so well appreciated, the time may be extended by opening them earlier in the day next year.

Microscope Cinematography.—Using the last written word in a general sense to represent the "living photographs" idea, it may be noted that Dr. R. L. Watkins, of New York, has adapted its principles to the representation of the motions of minute objects seen under the microscope. His greatest difficulties lay in the selection of suitable lenses, and the effect of the heat of the lamp upon the objects to be photo-micrographed, every kind of life being either destroyed, or impaired, or the object itself dried up; but Dr. Watkins secured a number of excellent pictures, notwithstanding these difficulties. The object to be photographed is put in position and made to lie in a horizontal plane. The illumination is obtained from a small arc light, and the long film is placed in a box over the eye-piece. Running in a belt over an arrangement of wheels, it passes across a small window in the box, situated in the axis of the lens. The requisite motion is imparted to it by a small crank, which enables an exposure of 1600 pictures per minute to be made, though it is possible to increase it to 2000, or 2500 per minute. Dr. Watkins found that the blood corpuscles in a frog's foot moved too

rapidly to permit of their being photographed with his apparatus as at present arranged. It is anticipated that the *micro-motoscope* will actually enable additions to be made to our knowledge of the lower forms of life by permitting us to study over and over again those life incidents that, in the rapidly moving field, might readily escape observation.

Guildhall Picture Gallery.—The City Art Gallery at the Guildhall is greatly to be enriched by the addition of some 200 more pictures. They are mostly by old Dutch, Italian, and English masters, and are the gift of Mr. D. P. Sellar, of Dudbrook, Brentwood. It is not often that an art gallery is the recipient of a couple of hundred works as a single donation. In his letter to the Lord Mayor, offering the pictures, Mr. Sellar said he hoped they would form the beginning of a collection worthy of the City. It is needless to say that the handsome offer was accepted with grateful thanks, and it was referred to the Library Committee to make proper provision for the reception of the pictures at the Guildhall. For some years there has been a nucleus of a collection of pictures in the the Gallery, but it is a small one, and not one worthy of the greatest city in the world. It is to be hoped, now such a munificent start has been made, other donations will follow. It has been said that nothing is thought of in the City but making money. That is not true, as witness the number who visit the loan exhibitions that are held annually at the Guildhall.

Another New (?) Photographic Discovery.—An evening paper that often indulges its readers with information on matters photographic last week, tells them that "photographers will be interested to learn that Captain Colson has devised a method of diminishing the time of exposure of photographic plates in order to get a good image. He states that some of the light goes through the gelatino-bromide plate, and he reflects it back into the film by a screen of white paper or cardboard close behind the film." It is added that "his plan has been adopted by the Société Française de Photographie." It would be somewhat interesting to learn from the Society how they find such plates, when they are developed, in the matter of halation. The idea of backing plates with a white material with a view to shortening the exposure is by no means a new one. In our notice of the late Historical Exhibition at the Crystal Palace, in the issue for September 3, we referred to a letter of the late Sir David Brewster, dated September 10, 1850, relating to the albumen process, in which he says that the exposure may be much shortened "by placing a white ground at the back of the plate."

The Metric System.—We have frequently referred to the metric system of weights and measures, and the convenience it would prove to photographers if it were universally adopted. Thanks are certainly due to the Earl of Crawford for bringing the matter so prominently forward at the Royal Photographic Society the other evening. The result will be looked forward to with interest. Some few years ago the Photographic Club tried to bring about the general adoption of the metric system, and sent circulars to all the principal photographic societies in the kingdom asking their co-operation in the matter. We believe that all the societies that replied were in favour of the system, but nothing came of it. We know that many members of the Club provided themselves with glass measures, graduated on the one side in ounces and minims, and on the other in the litre and cubic centimetres, so that they could be used according to both the English and the Continental systems, but it is a little questionable if they were not more used under the former than the latter system.

THERE seems to be a prevailing idea that weights and measures, graduated according to the metric system, are more costly than those under the English system. This is so at some shops, but there is no reason why it should be so. As a matter of fact, in the trade the glass graduators charge according to the number of graduations, quite irrespective as to whether they are pints, ounces, drachms, litres, or c.c. As regards the weights, fancy prices are charged for them by some of the English scale-makers, and then they are not always to be relied upon. We were recently shown a set for which a high price, compared with foreign makers, was paid, which were self-evidently very inaccurate. For example, when the hundred-gramme weight was placed in one scale pan, and one hundred grammes, made up of the smaller weights, in the other, there was a discrepancy of something like half a gramme between them. The same was the case, more or less, throughout the set. We have a set of foreign make, representing about three hundred grammes, ranging from one centigramme upwards, which we purchased retail for something less than five shillings, that are perfectly accurate. On all the larger weights we have stamped with punches their equivalent in English grains, so that they serve under both systems. We have before now suggested that dealers should stock both measures and weights marked according to the English and the Continental methods. If the Royal Photographic Society were to take this matter energetically in hand just now, there would be some hope of the metric system becoming universal amongst photographers. It would be a boon to most, as all the formulæ we get from the Continent, and many from America, are expressed under that system, and often suffer in conversion into the English one.

A PERFECT NEGATIVE.

UNTIL I read the report of the discussion on Mr. Edwin Banks's paper at the London and Provincial, I was under the impression that it was now accepted that the integrity of the shadows of a negative, that is, their freedom from stain or abnormal deposit was one of the necessary conditions of a good, and certainly of a perfect, negative, and that the old idea that a pyro-stained film added to the printing qualities of a negative had entirely exploded.

In the early days of the use of sodium sulphite or sulpho-pyrogallol as the developer was termed, I know there was a strong outcry in many quarters that the black-and-white negatives so obtained were inferior in printing results to those obtained with pyro alone, and perhaps at that period there was some truth in the allegation, for it took some time for photographers to accustom themselves to the change, and to recognise that what the negative lost in stain required to be made up not only in general density, but in better gradation; or perhaps it would be more correct to say that the finer gradations required to be stronger in order to bring them up to the fictitious strength the stain gave them. But I think the majority of workers have long since recognised and acted upon this fact, and, seeing that the use of the sulphites in conjunction with pyro has become so universal, to say nothing of the introduction of newer developers giving a black-and-white image, it would look as if the great body of photographers were of the same opinion as Mr. Chapman Jones and Mr. Banks, that the perfect negative should consist of "pure silver in clean gelatine."

Messrs. Hurter & Driffield gave another definition of a "perfect" negative, which, if differently worded, practically amounts to the same thing. "A perfect negative," say those gentlemen, "is one that gives a print having correct gradation in the shortest time," or words to that effect. They do not say it must be a quick printer, which seems to be about the only feature that some photographers recognise in a black-and-white negative, but that it must give correct gradation, and it follows, as a matter of course, that of two negatives, each conforming to that condition, the one that does it in the shortest time must have the advantage, and must therefore approach nearer to the character of perfect. We may go further, and argue that of two negatives, each giving correct, or, we will say, equal gradation, the one that has the clearest shadows will be the quicker printer, and therefore the better negative, for it is impossible to conceive that a pyro-stained film can, under any circumstances, give as good a print, in as short a time, as a stainless negative that secures its gradations by honest variations in the thickness of the silver deposit.

But the question may be raised as to what constitutes correct

gradation, and it is not an easy one to answer. There can be but one really correct series of gradations in a picture presented to the eye or the camera when submitted to photometric measurements; but, if half a dozen plates be exposed simultaneously, they will probably give as many different renderings, according to development and other circumstances, and yet each may be claimed to be "correct," according to the point of view from which it is judged. Scientific correctness in this respect as measured by the photometer is a different thing altogether from artistic correctness, which may vary with every individual judgement, and probably does. Even granting this, it seems to me that the argument is still in favour of the black-and-white negative, for even the supporters of the pyro stain must admit that if the same quality of result can be secured without the stain as with a nearer approach is made to Messrs. Hurter & Driffield's ideal.

But there is the "if." I do not know whether it is conceded by the adherents of pyro that the same quality is attainable, even at the expense of a little more care and trouble, or whether they stand out for the absolute superiority of the stain. Personally, I should side with Messrs. Chapman Jones, Banks, and A. L. Henderson, and "plump" decidedly for the stainless film, not only as regards the possibility of getting the same quality, but of getting it without any greater trouble. I would go even further were it not for the uncertainty that hangs about the question of "artistic" gradation, which, as I have said, depends so much upon the personal element, and say that the black-and-white negative gives the better gradation of the two. But I am afraid it would be a difficult, if not an impossible, matter to decide the point, so I will venture on a compromise, and be upon perfectly safe ground. I will put it that the black-and-white negative—the pure silver image in clean gelatine—is absolutely the only one that is capable of rendering "correct" gradation, scientifically measured, and that pyro and its stain are not in it.

It follows almost as a necssary corollary, when we take into consideration "latitude" and the possibilities of variation in exposure and development, that if the uncoloured film is capable of giving correct gradation, and is at the same time amenable to variations therefrom, even taking the pyro-developed film as the acme, the *summum bonum* of artistic perfection, as it seems to be in the opinion of some, then the black-and-white image can imitate it, and with the advantage of greater printing rapidity, which again brings us knocking up against Hurter & Driffield's perfect negative.

One argument, a weak one, I know, that has been brought up in favour of the stain, is that, if it be removed, the negative is deteriorated in quality. That may be, but it only proves that the image is an inferior one to start with, and requires bolstering up with stain to make it print. In the same way, if we have a thin negative, we print it under tissue paper or coloured varnish, or, as some have done, actually stain the film; but we are only resorting to a subterfuge to soften the imperfections of the originals, and in no sense do we attain a result approaching correct gradation attained in a *bonâ-fide* manner by correct exposure and development.

There is another argument, too, upon which the backers of the stain rely, namely, that it is not merely a tinting of the gelatine film, but that it is stronger where the image exists; that it is, in fact, proportionate to the strength of the silver image; in proof of which it has been alleged that the latter may be removed and still leave an image in pyro stain. So far as the existence of an image in oxidised pyro is concerned I am quite willing to fall in, but with regard to its being proportionate to the silver image—in fact, to its presenting any gradation—I have the strongest doubts. That it is stronger where a deposit of silver has occurred is undoubtedly true, and is explained by the greater oxidising action that goes on in those parts; and, though it may be actually strongest in the very highest lights, I very much doubt whether any real gradation exists in the different parts of the image. I have removed many silver images from simple pyro-developed films as well as from others that have been intensified with substances other than silver, and also from various "printing-out" surfaces, and have often been met with a residual image caused by some sort of chemical action outside the reduction of the silver salts. But such image is almost invariably of one even tone, a mere *silhouette* rather than a rendering in half-tone of the subject, and such I believe to be the constitution of the pyro stain.

If this be the case, of which I have very little doubt, it fully explains, amongst other things, why staining the film of a black-and-white negative, or printing through a coloured varnish, does not exercise the same action as staining the film in development. It explains, too, why a pyro-stained negative gives a much more "plucky" print than an apparently equally dense, or denser, black-and-white negative; but it does not constitute "correct" gradation. Looked at from this point of view, it simply serves to emphasise how badly wanting in correctness of gradation the *bonâ-fide* silver image must be without the stain.

The negative, we are all agreed, is only the means by which we arrive at the print or positive, and so long as it produces its result to a certain extent it is immaterial how the end is attained. But let us have a correct understanding of how things are, and not a case of the false usurping the place of the true. Chemically and scientifically, the perfect negative, if such exists, is, as Mr. Chapman Jones says, composed of pure silver in clean gelatine. If Messrs. Hurter & Driffield's description gives its accurate scientific character as giving a print "with correct gradation in the shortest time," we may take the artistic function of the ideal pyro-negative to be to yield a "decent result with the least possible trouble."

All the same, it does not follow that because a negative is "black and white" it is perfect, or even a good one, nor because it is pyro-stained it is necessarily a bad one. I think, as a rule, the vilest productions one sees handed about by beginners are the miserable hydroquinone or eikonogen developed things they try and pass off as negatives, for, curiously enough, beginners, as a rule, fight shy of pyro. On the other hand, I have seen some of the "very loveliest" printers in the shape of unmistakably dubious samples of pyro stain. Then, again, perfection of gradation does not count for much if it is beyond the capabilities of our every-day printing processes; I have met with cases of the most perfect and delicate gradation it is possible to imagine in the shape of metol-developed films that not the "steepest" graded printing surface in existence would do justice to. After all, perhaps, the "perfect negative" is very much like apples and onions—a matter of taste.

W. B. Bolton.

A NEW IRON PRINTING PROCESS.

[Photographische Correspondenz.]

A new printing process, founded on the light sensitiveness of iron salts combined with an organic substance, has just been placed on the market by the Chemische Fabrik auf Actien, vormals Schering. It is possible, by means of this new paper, to produce in two ways a positive with black lines on a white ground, from a positive such as a tracing; it will, therefore, be of considerable value for engineers' and other plans, and it is called the duplex positive paper.

A good stout paper is used, and before exposure it has a faint yellowish glazed surface. After exposure under a tracing, a yellow image is seen on a white or silvery grey ground. The ferric salt is, by exposure, converted into a greenish or white ferrous salt. This faintly visible image possesses such properties that it may be converted into intensely coloured positive images in several ways.

The film of the paper is, in an unexposed state, insoluble in cold water, and does not swell up, or at least only to a small extent, whilst after exposure it readily takes up water. If, therefore, a sheet of paper exposed under a drawing be coated with some colouring matter insoluble in water, such as printer's ink, litho ink, &c., and this be allowed to dry, and the print placed in water, the exposed parts will hold the ink, as these parts are not capable of absorbing water, whilst the exposed parts can absorb water through the back of the paper as well as through the thin film of ink, and it can then be washed away, so that a sharp image of the drawing or tracing will be obtained in black, with all the fine lines of the original, on a white ground. Of course, any insoluble colouring matter may be used, provided it is combined with a suitable vehicle.

The ferrous salt can also be converted chemically into a colouring matter, as, for instance, with tannin, pyrogallol, and gallic acid, in fact, the image may, by means of these, be converted into ink. In an acid gallic acid bath it gives a violet-black image.

The treatment of the paper is, briefly, as follows. If it is required to

produce a print in a fatty ink it should be exposed under a good original for from one and a half to three minutes in the sun, or longer in diffused light, till the ground has become nearly white. The print is now covered with a greasy ink which has been brought to the right consistency by dilution with from two to three times its volume of turpentine; a pad of flannel or soft brush may be used for this purpose. The black coating should appear quite even, and not too thick, as otherwise it makes development more difficult. The print should now be allowed to dry for from seven to thirty minutes, and then pinned to a board or placed in a dish and well washed with running water, preferably with a rose. The black will soon begin to dissolve off the ground, and the drawing appear black on a grey background. As soon as this appears, the print should be rubbed over with a pad of flannel or brush, till the paper appears quite white. Under-exposure will be recognised by the lines being much too broad, and the ground refusing to clear up. Over-exposure gives weak, thin lines, or, in case of very fine ones, they may disappear altogether. After development, the print may be hung up to dry, and, finally, rubbed over with talc or magnesia.

If the print is to be developed in the gallic acid bath, printing must be carried on somewhat further than for the above method.

Dr. Otto Buss.

SOLARISATION.

Much attention has recently been given to the subject of halation and its prevention, and the merits of various plate-backing mediums have been frequently discussed. The fact that a backing, which effectually prevents halation, also very appreciably retards solarisation, seems, however, to have received little notice, though it is of sufficient importance to deserve careful consideration.

If we take a negative showing a fairly lengthy series of gradations, and expose under it a partially backed gelatine dry plate for a time sufficient to solarise the highest tones, we find that the developed result varies very considerably in the backed and unbacked portions of the image. The backing not only hinders the fogging of the lower tones, but it also preserves the density of the upper ones to such an extent that it is evident reflected light must play a very important part in the production of solarisation. It is also noticeable that solarisation does not commence in any tone until after a maximum amount of developable density has been attained, that is, until direct light has penetrated the whole depth of the film, and more or less affected every layer of particles. This condition must also be fulfilled before halation can be produced; hence it is evident that halation and solarisation must, to a certain extent, take place concurrently.

Halation is only generally recognised by the appearance of more or less dense local fog in the lower tones adjacent to the high lights; but, obviously, the high lights themselves must be simultaneously affected in a similar way, and to an even greater extent. The film in the lights is practically illuminated on both sides, by direct light from above and reflected light from underneath, and, if we consider that the intensity of the direct light diminishes as it penetrates the film downwards, while that of the reflected light diminishes as it progresses upwards, it is obvious that, though the lower layers of particles are reached by weaker light than the upper ones, yet they are *more uniformly illuminated.*

There is another point with regard to the lower layers of particles in the high lights; if exposure is long enough to produce partial solarisation, *they remain undeveloped*, though with a shorter exposure they are readily reducible. This fact is generally well known, but it can easily be corroborated by giving a series of varying exposures and examining the backs of the results after development but before fixation.

The question now arises, Can the non-development of the lower layers of particles in the partially solarised film depend upon the fact that they have been submitted to more uniform illumination than the upper ones? or, to put the question another way, is it possible that a particle uniformly illuminated by comparatively weak light can become undevelopable, or solarised, more rapidly than one that is subjected to much stronger light, but on one side only, as is practically the case with the upper particles? If so, it not only follows that the solarisation of a single particle depends more upon the uniformity of the illumination than upon the intensity of the light reaching it, but also that, in an unbacked plate, solarisation must commence near the glass support and progress upwards to the surface of the film.

These assumptions, though apparently quite contrary to preconceived ideas, nevertheless accord very closely with observed phenomena, and a little consideration will show that their truth is by no means improbable.

Speaking generally, there are two theories that have been put forward in explanation of the non-development of solarised particles. The first is that, by the continued action of light, the developable product of subsalt primarily formed by exposure is reconverted into non-developable normal salt. The second theory is that the developer is unable to reach these particles owing to its penetration being in some way hindered or obstructed. If we bear in mind the important fact that, by the use of a very weak developer, the effects of solarisation and reversal may be counteracted (a phenomenon on which much stress has been laid both by Captain Abney and Professor Meldola), it is evident that the developable light product cannot be completely destroyed by solarisation, for this would render the high lights absolutely undevelopable. Hence the first theory, if true, can only apply to a small portion of the light product, and, naturally, only to the outer molecules of the particle. Then, again, the phenomena of reversal are recurrent, positive and negative images being produced alternately; but this fact cannot be reasonably accounted for by the second theory, if we assume the obstruction to be owing to the induration of the gelatine during exposure. If, however, we assume that the obstruction consists of the normal salt reformed under the first theory and that this prevents the developer, not from reaching the particles but from reaching the developable subsalts still contained in those particles, then the phenomena referred to can be readily accounted for.

The recurrent nature of reversal can be attributed to the alternate production of subsalt and normal salt on the outside of the exposed particles, this effect being the most probable result of the action of light of a constant power upon the silver salts in the presence of a sensitive of continually diminishing power; and the correction of the effect of reversal, by the employment of a weak developer, can be understood if the developer is so weak as to be unable to produce any effect upon the particles in the non-image until after it has penetrated the protective coating of normal salt on the particles in the image, and reached the readily reducible subsalts underneath.

The effects of the uniform and unequal illumination of individual particles can now be compared. If a particle is illuminated from one side, some portions will only be reached by an amount of light sufficient to produce a minimum quantity of subsalt, but not powerful enough to rehalogenise it, and the particle cannot be absolutely undevelopable as long as a single molecule of subsalt is accessible to the developer. On the other hand, in the uniformly illuminated particle, if the light is powerful enough to rehalogenise the subsalt at all, it will do so uniformly, and the whole will be equally well pretected from the developer. A particle uniformly illuminated by even a comparatively weak light may therefore become completely solarised more quickly than one reached by much stronger light upon one side only; consequently, if the plate is backed, the uniform illumination of the lower particles being more or less effectually prevented, solarisation is retarded.

As before pointed out, the acceptance of this theory necessarily involves the admission that solarisation must commence at the bottom of the film and progress upwards, at any rate in the case of an unbacked plate. This affords an explanation of the more or less complete disappearance of halation, which results from giving a full exposure. If the exposure is full enough for this purpose, there is invariably a slight diminution in the density of the high lights, and both effects can be attributed to the same cause, viz., the occurrence of solarisation in the bottom layers of the film.

It is, of course, possible that solarisation may progress in both directions in the film, for the greater intensity of the light may, to a certain extent, compensate for the inequality of the illumination in the uppermost layers of particles. The evidence, however, all tends to show that, with an unbacked plate, it first appears in the lower layers and that a very powerful effect is produced in them before the upper ones are affected. If halation is entirely abolished, solarisation still takes place, though very slowly, but it is doubtful if the same ultimate effect can be attained as with the assistance of the reflected light. It is also probable that development is, to a certain extent, hindered by the induration of the gelatine; but, if it be remembered that a considerable degree of solarisation frequently results from a very brief exposure while a very long exposure is necessary to produce any marked effect of induration, it is obviously impossible that the attainment of solarisation can depend solely upon this factor. The gelatine becomes appreciably non-absorbent only when a very distinct printed-out image is obtained and an exposure long enough to produce this effect is, as a rule, a great deal longer than that necessary to produce solarisation. It must also be considered that induration of the gelatine, due to oxidation during exposure, may possibly be counteracted in some degree by the developer's oxidising power of the developer. A film that is impervious to plain water need not necessarily be so to the developer.

C. Welborne Piper.

REFRACTORY X-RAY TUBES.

The publication of a method of, if I may use the term, reinvigorating X-ray tubes by the simple expedient of attaching to the cathode end a ring or band of tinfoil has naturally led to the plan being adopted by some workers when dealing with tubes, which, by reason of much use, or extreme exhaustion, become difficult or impossible to work. Tinfoil is rather a troublesome thing to apply to any glass surface; use the thinnest layer of glue, and the time taken to dry is appreciable. Tinfoil, if I remember rightly, was going to make a boom in old broken filament lamps. Why, said some of the quid-nuncs, buy an expensive X-ray tube when an ordinary incandescent lamp with a disc of foil on the end will answer the purpose? But did it answer? For myself I say, Not at all. But tinfoil applied to a properly made tube certainly does make it easier to work, the improvement being in the direction of a steadier fluorescence. Whether the plan is likely to prolong the life of the tube is another matter, for the glass is extremely thin in some of them.

How best to apply the foil is the question. I may say I have tried gold paint (so called), but I understand that these compounds vary greatly, and that some makes give very poor results. It would be interesting to know the best "brand" to use for the purpose. In the mean time I venture to suggest the following as a simple method of applying foil. I may say that my first trial was made with a dental amalgam, a fine platinum stopping, which answered the purpose admirably. Take a piece of tinfoil, roll it into a ball, and powder in a mortar, using the smallest necessary quantity of quicksilver; when partly done, let it stand a few hours; it may then be finely powdered. Store it in a dry bottle, or mix at once with a little quick-drying varnish. Paint the mixture on with a soft brush, putting on two or more coatings if required. The varnish supplied with "gold paint," or gold size, answers very well, or we may use rather thick gum, but, of course, that will take a longer time to dry. Really the best way to apply the powdered foil—and it can be powdered very finely, is to *sift* it over the gummed or varnished surface; the deposit is much more uniform. A suitable sieve for the purpose is easily made out of a "chip box and a piece of muslin," in the manner well known of all chemists. I put a band three-quarters of an inch wide round the tube, two-thirds of this being in advance of the cathode disc; the tube can be used practically at once.

Franklin plates, Leyden jars, &c., should be easily made in this way. The foil paint mixed rather thick answers also very well for temporarily making contact with wires, &c.

It may be as well to remark that, the diluents used with these paints being generally very inflammable, great care should be used, and, if necessary to go over a big surface, it is better done by daylight.

J. Pike.

AN ADAPTATION OF TELESCOPE LENSES FOR PHOTOGRAPHY.

Mr. Henry Skillman Curtis describes, in a recent number of the *Photographic Times*, the following adaptation of a telescope to photographic purposes:—

The difference between a telescope lens and a photographic lens lies chiefly in the degree of correction for chromatic and spherical aberration. The former is ground to give an image free from visible aberration, and of extreme sharpness, capable of being magnified by an eyepiece. The field, however, is somewhat curved, so that only a small portion can be in the focal plane of the eyepiece at one time. A glance at fig. 1 will explain this more clearly.

Let A represent the telescope objective, the convex crown glass, *a*, and the concave flint glass, *b*, being placed as indicated, the usual position in lenses of this type. Also let B represent any distant object. An image of B will then be formed at the point, C, but will be curved somewhat, as indicated, only the middle portion being available for observation by the

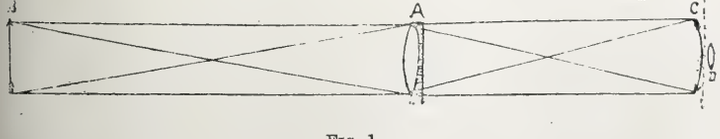


Fig. 1.

eyepiece, D. The field, therefore, of such a lens is limited, but, as astronomical objects are usually small, their images in the telescope rarely exceed the limits of clear definition. If, however, the image is of considerable area, it is evident that it cannot be focussed sharply on a plate at C, for, if the centre be in focus, the edges will be blurred, and *vice versâ*. In photographic parlance, "the field is not flat."

A few years ago it was the writer's good fortune to come into the possession of a fine telescope lens, two inches in diameter and thirty-six inches in focal length. The flint and the crown glasses were not cemented together, but were detached, thus inviting experiment. In the course of a research on certain properties of lenses, under the direction of Professor Rood, of Columbia, it occurred to me to try how good a photograph such a lens would make.

It already had been ascertained that, if the concave lens were placed in front of the convex lens, the area of sharp focus in the image would be much increased. The objective was set up in this manner, and a picture taken, but without any expectations of clear, sharp results, as I had laboured always under the mistaken impression, so common to amateurs, that good results could be obtained only by the use of fine and expensive apparatus. The results, however, were so satisfactory that it seemed worth while to follow the matter up. A series of experiments followed, the outcome of which has been a good deal of valuable knowledge concerning lenses and their ways, and the addition of an excellent photographic objective to the writer's outfit.

To sum up the matter, it was found that the defects of curvature could be effectively corrected by changing the relative position and distance apart of the components of the objective. A reference to fig. 2 will show how this may be done. Let the same letters represent similar objects as before.

The concave lens, *b*, is placed in front of the convex lens, *a*, the concave surface turned outward. The rays of light coming from the object,

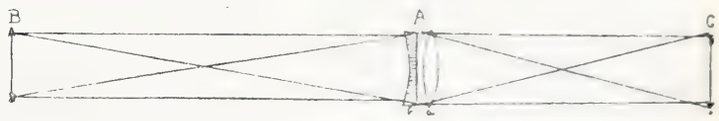


Fig. 2.

B, are bent outward, and made more converging, and this, in turn, tends to bend back the edges of the field and render it more flat.

When a telescope objective is to be used for photographic purposes, it is necessary also to alter the correction from that of visual to that of actinic rays. This is accomplished, in the case of large glasses, by adding a secondary convex lens of crown glass. This slightly counteracts the action of the flint lens, rendering the objective under-compensated for visual, but correctly adjusted for photographic purposes. The use of an additional lens is unnecessary for the correction of small glasses and for such purposes as an amateur would wish to accomplish. The desired result is obtained by the degree of separation of the flint and crown glasses.

The correcting power of the concave lens decreases the further it is removed from the convex lens. Consequently a point can be found where the former will act as a corrector for the actinic or chemical rays. This point can be determined readily by experiment. In the adjustment of the objective described above, about one millimetre, or one twenty-fifth of an inch, was found to be the right distance apart of the components.

A working aperture of slightly more than one-half the diameter of the lens was the largest that could be used. This, however, was sufficient for instantaneous work, while with a smaller stop the definition was perfect. An 8×10 plate was covered without difficulty, while with small stops larger sizes could be used. With lenses of comparatively short focus the greater curvature of the surfaces causes a decrease in the defining power, and smaller plates and stops must be employed.

In many instances the components of telescope and spyglass lenses are cemented together by means of Canada balsam. Separation can be effected by soaking the objective in warm alcohol. This operation had better be performed by an optician, as there is much danger, both from the alcohol exploding while it is being warmed, and the risk of cracking and ruining the lens.

PHOTOGRAPHY THE HANDMAID OF EXPLORATION.

Such was the title of an admirable discourse, last week, at the Camera Club, by one well qualified to judge of the value of camera work for exploration purposes. Professor Flinders Petrie is known all over the civilised world as one who has done as much as any one to unearth the antiquities of Egypt, and who probably knows as much about the Valley of the Nile and its half-revealed secrets as any man living.

Egypt has often been described as a country where there is an entire absence of picturesque scenery, a land where all natural attributes are tame and commonplace. Its great and only glory is its architecture, which has attracted visitors from all corners of the earth.

To the student, however, the Nile Valley—which is only another expression for Egypt—is full of interest as one of the first seats of civilisation, dating back to at least 3500 B.C., and probably earlier; as a country possessing a religion of its own, in which figured between seventy and eighty divinities, besides animals which were the subjects of adoration, and as a place whose history has been gradually unearthed from the sands by patient exploration during the present century.

Professor Petrie is one of the foremost of these explorers, and had the sagacity to see how useful photography would be to him in making records on the spot of his discoveries, and in preserving copies of such treasure-trove as was likely to pass out of his own possession, for, by an understanding with the Egyptian Government, no one is allowed to

dig for antiquities except on the condition that the State has first choice of the things found. In this way the pick of the articles unearthed, whether they be statues, mummies, pottery, or what not, go to swell the collections at the Gizeh Museum.

Like most enthusiastic workers, Professor Petrie does not burden himself with ornamental apparatus, indeed his camera is quite a primitive affair, but of excellent form for the particular purpose which he has in view. It is made of tinplate, and consists of a box-like structure, with a horizontal division midway. The upper part is the camera proper, furnished with a good rapid symmetrical lens, while the lower compartment will hold 200 films, with a loose partition in the centre to separate those which have been exposed from the others. A light tight bag, or sleeve, completes the arrangement. The hand is inserted in this sleeve after the object has been focussed, a film is slipped in front of the ground-glass screen, exposure is made, and by the same means the exposed film is replaced in its proper receptacle.

This arrangement does away at once with the necessity for double backs or changing boxes, and the camera is self-contained. Moreover, it is made of a material which an Egyptian porter cannot very well break if he tries; and let it be noted, in passing, that the Egyptian banger of luggage is even more merciless than his brother of the English railway stations.

Professor Petrie explained at the beginning of his lecture that he had a very different object in view in taking up photography to those which held the attention of his audience. He had no desire to make pretty pictures, he merely wanted records. Sometimes, however, he was beguiled by a beautiful sunset, or other atmospheric effect, to take a snap-shot or two, and his examples showed that he knew the value of that which was picturesque. He also showed a genuine moonlit scene, in which Diana herself shone out bravely, but he laughingly confessed that there was a good deal of dawn about at the moment. Under the circumstances, he might have quoted the well-known lines—

> "The moon is up, and yet it is not night,
> Sun*rise* divides the sky with her."

The lecturer quickly showed that such opportunities as the barren hills and gorges bordering upon the Nile offered for picture-making he was keenly alive to, and some of his examples were much applauded.

But our readers, some of whom may possibly be contemplating a future photographic tour in the land of the Pharaohs, will probably be more interested in hearing how this intrepid explorer carried out his work.

Let us remember that he was not a mere tourist, with nothing to do but to take pictures and change his plates each evening. His day was pretty well filled up in looking after his workers—a hundred or more—who required constant supervision. Then, he had books to keep, records to make, specimens to mark, and, in addition to all, he had to cook his own meals. How on earth he managed to do any photography at all under such conditions is a problem very difficult of solution.

A man of scientific training invariably takes up any fresh pursuit in a systematic manner, and this is the way in which our Professor attacked photography. The Egyptian sunlight is so intense that he made use of the slowest films he could procure. He invariably confined himself to two stops—*f*-25 and *f*-100—and with the latter an exposure of two seconds was generally sufficient. The open aperture he occasionally made use of for moving objects, and he controlled it, by the way, with an instantaneous shutter, which he fashioned out of an old meat tin. This contrivance, together with his tinplate camera, he showed at the lecture table, and they aroused much interest, as well as a smile or two. He had no dark room, and therefore his developing had all to be done at night. For two years he lived in a tomb, and in that cheerful residence he seems to have had quite a good time. Cut out of the living rock, it was always at about the same temperature, the variation between day and night being very small. His great difficulty was shortness of water; but, by economising the precious liquid, he was able to get through his work. When residing at an hotel, he was much better off; but, still, shortness of water was his bugbear.

He developed with pyro, and kept two developing dishes and two fixing dishes going at the same time. These were screened with yellow paper from the candle light, but of diffused light in the room he took no heed—a testimony this to the slowness of his films. His washing apparatus consisted of one basin and half a dozen soup plates, all full of water; and the films were transferred, face downwards, from one to the other until they reached the last of the series. After rinsing twenty films in this way, three of the soup plates were given a fresh supply of water. These operations he preferred to carry on after dinner at the table at which he had dined, as he could then work in what he considered great comfort. Think of it, ye fortunate ones, with your sink tap and constant supply of water.

Some capital pictures of the Egyptian natives, his own workpeople, and others, gave Professor Petrie an opportunity of mentioning the dislike—common to other Eastern peoples—which the Egyptians had to being photographed. The men were indifferent; the boys less so; but the girls and women invariably did their best to hide their faces. The wily Professor thereupon determined to be even with them. He made a diagonal mirror to fit over his lens, and, while the natives were interested in seeing him apparently take a picture of the landscape in front of his camera, they were unwittingly sitting for their own portraits. Another difficulty experienced in photographing the natives was found in the circumstance that they invariably screwed up their eyes in sunlight.

One or two hints the Professor had to give about lantern slides. He liked these pictures of Egyptian scenery and life to be developed much thinner than the ordinary English lantern slide, for he considered that in that way they imitated better the effect of intense sunshine. He marked his slides with their titles by a little slip of paper on the edge of the picture, so that lying in their box they could easily be arranged in order with a minimum of trouble. Possibly he was not aware that professional makers of slides invariably mark their sets in this same way.

The major part of Professor Petrie's discourse dealt, as may be readily understood, with the antiquities which he and his workers had unearthed, and most interesting were his lucid comments on these finds. The most perishable things are perfectly preserved in the dry sand of the Egyptian deserts, and he was able to show photographs of some of these objects which had lain in the ground for close upon 5500 years. It would be beyond our province to give any detailed account of this part of the lecture. Our chief purpose in calling attention to Professor Petrie's doings is to show what good work can be achieved by an earnest man under extraordinary conditions and difficulties.

Our Editorial Table.

List of Copyright Photographs of Celebrities.

Messrs. Elliott & Fry, the well-known photographers of Baker-street, send us their supplement "G" to their list of photographs of celebrities since January, 1897. Six lists between January, 1894, and December, 1896, have previously been issued. The lists are compiled for the use of those desirous of purchasing the photographs for sale or for purposes of reproduction. Colonial celebrities and troops, and naval and military celebrities monopolise list "G." We note that in January a complete list of all their portraits is to be issued by Messrs. Elliott & Fry.

The Commercial Uses of Coal Gas.

By Thomas Fletcher, F.C.S. Fletcher, Russell, & Co., Warrington, Manchester, and London.

Mr. Fletcher's book is a collection of papers and articles that have from time to time been communicated to societies or published in the press. The book pre-eminently appeals to those who use coal gas for commercial purposes, and it points out the most economical and effective methods in which it may be employed. Among the many industries for which its uses are discussed we may particularly cite enamelling on metal, japanning, lacquering plates, pottery firing, &c. Those photographers who use gas muffles for ceramic enamels may possibly derive some serviceable information from the book, which is obviously the work of an expert of many years' experience.

Historical Review of the Introduction of the Electric Light into England.

The Edison & Swan United Electric Light Co., 53, Parliament-street, S.W.

This handsomely produced pamphlet gives first of all a brief historical review of the Company, illustrated with portraits of Mr. Edison and Mr. Swan, and then describes the interesting exhibits which the Company made at the recent Crystal Palace Victorian Era Exhibition. The chapter on the introduction of the electric light into England is instructive and informative. The illustrations are admirably done.

The Autotype Tissue Colour Chart.

Published by the Autotype Co., 74, New Oxford-street, W.

Some months ago we noticed the Autotype Company's Colour Chart illustrating eight favourite tissues. At the suggestion of several of the Company's customers a complete chart, illustrating the whole of the stock tones of carbon tissues which the Autotype Company manufacture has been prepared, and a specimen has been forwarded to us. Sixteen portraits of children from negatives made by Mr. Byrne of Richmond have been selected for the carbon prints, and the chart is thus both pretty and useful. To workers of carbon tissue it should form a capital guide in the choice of a pigment.

Catalogues Received.

Levi, Jones, & Co., Limited, 78, Farringdon road, E.C.

The catalogue of optical lanterns and accessories which Messrs Levi, Jones, & Co. have sent us extends to over one hundred pages,

and is replete with illustrated particulars of a large assortment of lantern goods. A section is devoted to kinematographic apparatus and films. At this season of the year, when activity in lantern work is at its greatest amongst photographers and others, this catalogue should be very useful for trade references.

MESSRS. W. WATSON & SONS, of 313, High Holborn, send us a price-list of the Motorgraph, films and accessories for animated photography. Some hundreds of positive films for the Motorgraph are also listed. This catalogue should prove especially useful, as it details all the requirements for this interesting branch of photography.

News and Notes.

FOR their exhibit at the Brussels International Exhibition the Autotype Company have been awarded a Grand Prix, the only photographic award.

THE HACKNEY EXHIBITION.—The Hon. Secretary writes: "Will you kindly remind your readers that entry forms for the Hackney Exhibition are to be sent in by the 23rd inst?"

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mrs. Barton, The Grove, Wishaw, Warwickshire, for her negative, *Studies of Children*.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, October 26, at the Gallery, 5A, Pall Mall East, at eight p.m. *Photo-micrography from 2 to 2000 Diameters*, by Edmund J. Spitta, L.R.C.P., M.R.C.S.

MR. DUNCAN C. DALLAS, of 5, Furnival-street, E.C., informs us that he proposes to issue a book of instructions for working the secret processes of Dallastype and Dallastint. The terms and fees can be had on application to Mr. Dallas at the address given.

THE EXCELSIOR PLATE.—This is the well-chosen title given by Messrs. B. J. Edwards & Co., of Hackney, to a new plate of great rapidity at popular prices. It is adapted for studio and professional work as well as for fast exposures out of doors. In the JOURNAL this week is published the reproduction of the negative of a yacht taken on the plate by Mr. Edwards in the fiftieth of a second at *f*-16.

PHOTOGRAPHIC CLUB.—Wednesday evening, October 27, at eight o'clock. Travellers' Night, *The Châteaux of France*, by Mr. J. J. Vezey. The slides by Commander Gladstone. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

WE are sorry to learn of the death of Mr. F. W. Edwards, the well-known photographer of Bellenden-road, Peckham. The deceased gentleman, who was forty-nine years old, will be chiefly remembered for his excellent architectural and reproduction work. Since its foundation he was President of the second South London Photographic Society. He was of a most genial disposition, and was highly esteemed by a large circle of friends.

WATERLOW AND SONS, LIMITED.—The above-named Company has been registered by Messrs. Linklater & Co., of 2, Bond-court, Walbrook, E.C., with a capital of 1,350,000*l*., in 10*l*. shares, of which 54,000 are preference, 54,000 preference ordinary, and 27,000 deferred ordinary. The objects of the Company are to acquire and take over, as a going concern, the business now carried on by a Company of the same name, and to enter into two agreements, dated October 4, 1897, with the said Company, and to carry on the business of stationers, printers, lithographers, photographers, photographic art printers, engravers, die sinkers, envelope manufacturers, &c. The subscribers are:—P. H. Waterlow, 26, Great Winchester-street, E.C.; J. Bass, 26, Great Winchester-street, E.C.; G. S. Waterlow, Finsbury Stationery Works, E.C.; C. H. Waterlow, Blomfield House, London-wall, E.C.: D. S. Waterlow, 15, Hill-street, Finsbury; P. L. Waterlow, Skinner-street, Finsbury, E.C.; E. L. Waterlow, Finsbury Stationery Works, E.C.; F. A. Bell, Finsbury Stationery Works, E.C.; R. J. Smith, 26, Great Winchester-street, E.C.

A COPYRIGHT CASE.—At the Eastbourne County Court, on the 14th inst., before his Honour, Judge Martineau, a case was set down for hearing in which Thomas Bradbridge Rowe, trading as G. & R. Lavis, photographers, of Terminus-road, Eastbourne, sued Mr. Parsons, proprietor of the *Eastbourne Standard*, to recover the sum of 1*l*. 1*s*. in respect of a copyright photograph produced by the defendant. Upon the case being called, there was no appearance on plaintiff's behalf. Mr. Lawson Lewis, who appeared for the defendant, explained that the claim was for the improper production of a photograph, which the plaintiff alleged was a copyright photograph belonging to him. The publication took place on February 12, and plaintiff, whom he (Mr. Lewis) knew very well, called upon him and assured him that the photograph was registered for copyright prior to this date of publication. On this assurance, Mr. Lewis told plaintiff that the defendant could have no case, and by his advice the defendant handed over the guinea. It was subsequently ascertained that the receipt for the registration of the photograph was dated February 13. His Honour: Do you mean to say that after the claim had been made you settled it? Mr. Lewis: Yes, under a misapprehension. He understood, however, that the plaintiff was willing to have the case thoroughly gone into, and that Mr. Hillman would represent him. Mr. Hillman said the plaintiff had been there, but, having received the guinea, he was content to let matters rest. His Honour said he was afraid he could not help Mr. Lewis. If the plaintiff had been present, he could only have made one order, and that was that, the money having been paid, the case should be struck out with costs. He did not see how he could make an order for the money to be refunded, as the defendant's only remedy was to bring an action against the plaintiff in respect of the guinea, which he alleged had been paid under a misapprehension.

THE EASTMAN EXHIBITION.—This Exhibition opens at the New Gallery on October 27, remaining open till November 16. The object of the Exhibition is to show the increasing extent and importance, and the distinctive qualities and advantages, of film photography. The four spacious galleries at the New Gallery are each made use of for a special purpose. In the central hall there will be Kodak appliances, including novelties of the greatest importance in the rapidly increasing popular use of film photography. In the second room will be included the results of a large Kodak Film Picture Competition, and in respect of which section alone the Company have received far more than 20,000 exhibits, from which those shown are selected. In a third room will be found a number of enlargements from photographs by the best-known photographic exhibitors in Great Britain. The fourth gallery is devoted to technical exhibits, which will be made instructive and interesting to the general public by the aid of explanations and comments attached to the pictures. Amongst the topics illustrated in this section will be the use of the Kodak and film photography in illustrated journalism, examples of the long rolls of film pictures used in animated photography, X-ray records taken upon special paper several copies at a time, and many other interesting subjects. Two of the galleries, in which the pictorial photographs are hung have been specially decorated, and the picture frames all made to suit the respective schemes of colour and ornament of the rooms. The Company have also been honoured with permission to make pictures from Kodak film negatives by their Royal Highnesses the Duchess of York, the Duchess of Fife, and the Princess Victoria of Wales.

BATTERSEA POLYTECHNIC, Battersea Park-road, S.W.—Session 1897–8. The Evening Classes in Photography commenced on September 27, 1897. The teacher is Mr. Edgar Senior (Honours Medallist, City and Guilds Institute), and the following are the courses:—Elementary (25 lessons): Lectures, Mondays, 7.30 to 8.30; Practical, Mondays, 8.30 to 10. Fees: Trade Students—Lectures, 4*s*. per session; Amateurs, 6*s*. per session; Trade Students—Practical, 7*s*. per session, 3*s*. 6*d*. per half-session; Amateurs, 10*s*. per session, 5*s*. per half-session. Advanced (30 lessons): Lectures, Thursdays, 7.30 to 8.30; Practical, Thursdays, 8.30 to 10. Fees: Trade Students—Lectures, 5*s*. per session; Amateurs, 7*s*. per session; Trade Students—Practical, 10*s*. per session, 5*s*. per half-session; Amateurs, 12*s*. per session, 6*s*. per half-session. A reduction of 1*s*. per class is made to members. The Advanced Course prepares students for the City and Guilds Examinations. The new regulations of the City and Guilds Institute require students to pass a local practical examination before admission to the written examination in the ordinary grade. The photographic department contains a studio and well-fitted dark rooms for developing and printing. The equipment includes a studio camera ($8\frac{1}{2} \times 8\frac{1}{2}$), with stand and background, a Joel arc lamp with reflector, enlarging apparatus, accessories, and a special camera for lantern slides, so that ample provision exists for practical work. The classes are primarily intended for trade students, but other students are admitted upon payment of higher fees. Students are provided with necessary chemicals and apparatus free of cost, but must provide their own plates, sensitive paper, &c. A special class for enlarging is held on Mondays, 8.30 to 10. Fee for 10 lessons, 9*s*.; half-course, 6*s*. Prospectuses for all classes held at the Institute gratis on application to Mr. J. Harwood, Secretary, Battersea Polytechnic, Battersea Park-road, S.W.

INGENIOUS AND IMPUDENT FRAUDS.—Robert Wheeler and Fred Burke, two respectably dressed men, were charged on remand at the Warrington Police Court with stealing two bottles of champagne, and with stealing, by means of a trick, 1*s*. 6*d*. from Thomas Timmins, of Catherine-street, Warrington. Wheeler was further charged with stealing 2*s*. from Elizabeth Ashton and Esther Cook, of Selby-street, Warrington. The chief constable stated that the prisoners were first charged with stealing the champagne, and that led up to the discovery of their having committed a multiplicity of photographic frauds. It appeared that Burke went to Miss Timmins's shop, and asked her if she would like her photograph taken. She replied that she would if the terms were reasonable. He then showed her a large framed photograph, and said he represented Messrs. Brown, Barnes, & Bell, of Liverpool, and that firm would supply her with three cabinet photographs for 3*s*., in addition to a framed photograph. They said the reason the firm offered such reasonable terms was because they had purchased the business of Mr. Birtles, of Warrington, and they wanted to advertise the business. Miss Timmins, after asking her father's consent, gave the prisoners 1*s*. 6*d*. on account, Burke saying that she would have to pay the other 1*s*. 6*d*. when she sat for her photograph at Mr. Birtles' studio. Wheeler then looked into the shop, and said, "Are you going to be all day?" and Burke replied, "I shall only be a minute, sir." Burke then said to Miss Timmins and her father, "That is our superintendent." He gave her what purported to be a receipt, and which was really a canvassers' counterfoil of Messrs. Brown, Barnes, & Bell, which had been cleverly and neatly altered by pasting paper over a printed note, which said it was not a receipt for the money. When Miss Timmins went to have her photograph taken at Mr. Birtles', she found that she had been defrauded. The other cases were similar. In some cases Wheeler told people that they would have to pay their own fare to Liverpool, but that the firm would give them a good tea when they got there. The poor people who had parted with their money could ill afford to lose it, and, when they went to Liverpool, they found that they had been defrauded. The men had been in the employ of the well-known Liverpool firm, but, after obtaining possession of the books, &c., they disappeared. In addition to the photographs, the prisoners carried blank billheads of different firms. They were men of good education and attainments, which might have brought them success if they had been rightly used. Mr. Stevenson, of Messrs. Brown, Barnes, & Bell, said his firm had been put to a great deal of inconvenience and annoyance through the prisoners' conduct. Wheeler especially had done them a great deal of harm during the last two years. The prisoners pleaded guilty to the charges, and Wheeler asked for leniency, on account of his age and his thirty-eight years' experience as a commercial man. He had only been in the hands of the police once, and that was about a month ago in Liverpool, when he was discharged. The chief constable said that prisoner was charged with two offences at Liverpool a month ago, and in one case he was convicted, being sentenced to one day's imprisonment. Burke

said he had been out of work for a considerable time, and, being lame, he could not compete successfully with other men. Wheeler was sent to gaol for six months, and Burke to four months. The chief constable said the prisoners were "wanted" by the Liverpool police.

Patent News.

THE following applications for Patents were made between October 6 and October 13, 1897:—

PRINTED MATTER ON PLATES.—No. 22,701. "Improvements in Photographic Apparatus relating to Means for Obtaining Photographic Impressions of Written or Printed Memoranda on Undeveloped Plates and Films." J. B. LEE.

ANIMATED PHOTOGRAPHY.—No. 22,763. "Improvements in Apparatus for Displaying a Series of Representations of Moving Objects." A. B. LANGHAM.

ANIMATED PHOTOGRAPHY.—No. 22,747. "Improvements in connexion with the Projection of Photographs of Animated Subjects, and Methods of taking the said Photographs." J. BONN.

ACETYLENE GAS LANTERN.—No. 22,776. "A Compact Optical Lantern Outfit for Acetylene Gas." V. HYDER.

WASHING PRINTS.—No. 22,789. "An Improved Device for Washing Photographic Prints." A. N. B. MUIR.

CAMERAS.—No. 22,946. "Improvements in or relating to Photographic Cameras." H. W. Teed.

PHOTO-ENGRAVING.—No. 23,187. "Improvements in or relating to Photo-engraving." J. B. STOKES.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
25	Bradford Photo. Society	*Hints on Copying.* F. Cowburn.
25	North Middlesex	*Some Remarks upon Development.* S. H. Fry, F.R.P.S.
25	Richmond	Acetylene Gas Demonstration. The Acetylene Gaslight, &c., Company, Limited.
26	Brixton and Clapham	Members' Open Evening.
26	Hackney	Excursion Work: Judges' Criticism.
26	Royal Photographic Society	*Photo-micrography from 2 to 2000 Diameters.* Edmund J. Spitta, L.R.C.P., M.R.C.S.
27	Borough Polytechnic	*Photography of Interiors.* J. T. Sandell.
27	Croydon Camera Club	Trial Night for Lantern Slides to be Displayed at the First of the Season's Public Lantern Shows.
27	Kingston-on-Thames	*Cloud Photographing.* A. Horsley Hinton.
27	Leeds Camera Club	*The Gentle Art of Making Failures.* P. E. Newstead.
27	Leytonstone	*Glasgow and the Vale of the Clyde.* M. D. Kerr.
27	Photographic Club	*The Châteaux of France.* J. J. Vezey.
27	Polytechnic	Enlarging Night. F. Parker.
27	Southport	*Elementary Optics.* R. Child Bayley.
28	Ashton-under-Lyne	Conversation on the 1897 Exhibition Pictures.
28	Darwen	*The Riviera and Monte Carlo.* J. T. Lees.
28	London and Provincial	Open Night.
28	Manchester Amateur	*Printing on Bromide Paper.* Rev. H. W. Dick.
28	Woolwich Photo. Society	*Intensification and Reduction.* John McIntosh.
29	Borough Polytechnic	*Flashlight Work.* W. J. M. Nunn.
29	Croydon Microscopical	Discussion as to *Soirée.*
29	Wakefield	*Architectural Photography.* H. W. Bennett, F.R.P.S.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 19,—Photo-mechanical Meeting, Colonel J. Waterhouse in the chair.

LUMIÈRE'S CINEMATOGRAPH.

Mr. JULES FUERST exhibited MM. Lumière's Cinematograph, which he said was the first instrument of its kind introduced, and explained the method of exposing the negative film, printing the transparency, and projecting the pictures by means of the lantern. The exposures could be made at the rate of fifteen per second, or nine hundred per minute, the latter period exhausting the film, which was about fifty-five feet in length, and perforated either according to the Lumière gauge of one hole to each picture, or to the Edison gauge of four holes. The focussing screen consisted of a piece of uncoated matt film, which Mr. Fuerst said answered the purpose better than any other screen. The easiest method of developing the negatives was to suspend the spool of film above two pails filled with developer, and to pass the film repeatedly from pail to pail as rapidly as possible, fixing being performed in a similar manner. The projecting apparatus enabled the views to be changed in a few seconds, so that about twenty-five series of pictures could be shown in half an hour. It was announced that a demonstration of the cinematograph would be given at the Exhibition at Pall Mall on Monday evening, November 1.

THE HELIOCHROME PROCESS.

Mr. Paul Waterlow was unfortunately prevented by indisposition from being present at the meeting, but Mr. J. D. GEDDES read his paper, entitled *The Heliochrome Process applied to Artistic and Commercial Illustration.* Mr. Waterlow said he was convinced there was a near and important future in the world of illustration for the processes of colour printing by means of typographic blocks produced by the heliochrome and kindred systems. Until recently, the only methods available for the *facsimile* reproduction of paintings or objects in colour were the chromo-lithographic printing process and its allied process of chromo-typography, the principles of working being the same in both cases. By these methods, however, a number of separate drawings and printings might be necessary to produce the effect of the original, the artist or "chromist" required a long experience and artistic training, and his work called for the highest qualities of skill and judgment. When such skill was available, and time and considerable expense were not an object, the results were entirely satisfactory, but, if one or other of the conditions were modified, the result would be only approximately correct, and would be dependent upon the idiosyncrasy of the chromist. Heliochrome would not overcome this at once and for ever, but the time was not far distant when it would do so, and it had already taken a place amongst the foremost methods for colour-reproduction; it solved all questions as to number of printings, the three negatives—of the yellow, red, and blue—being sufficient to reproduce any subject in all its colours, and the blending of the colours was so artistic and refined that it was small wonder lithographers and artists were startled when the results were first shown. Much remained to be done in regard to the selection and perfection of colour screens and sensitisers, and particularly in the direction of improving the transparency and purity of inks; ink manufacturers had accomplished much, but varnishes and oils were frequently so crude and impure that it was extremely doubtful whether, when they were applied to delicate tints, a disturbing element was not introduced. Chromo-lithography was not likely to be ousted by the new processes, which would probably only affect some of the finer art reproductions, but heliochrome had already had its influence upon the lithographic artist, who had learned from it how to obtain better effects in fewer colours. Commercially, there appeared to be no limit to the application of the method, and as soon as manufacturers realised what a power there was in a catalogue illustrated in colour as against one in black-and-white, there would be another such revolution in catalogue and special list illustrations as occurred when the half-tone block took the place of the woodcut.

A large collection of specimen prints were passed round for examination, the originals in many cases being also shown for the purpose of comparison, and, in the short discussion which followed, the excellence of the work was unanimously remarked.

Mr. W. GAMBLE, while thoroughly recognising the value of the process, did not see that it could ever be commercially successful unless operators appreciated the importance of correct mathematical conditions. There was too much "rule of thumb" in the process work of to-day, and it was hopeless to expect that any method of this kind could be satisfactorily worked unless there was a change in that respect. If it were possible to produce the three negative images from one lens at one exposure, a great step forward would be made; and it was also very desirable that a plate sensitised with cyanine, or something equivalent to it, could be obtained, instead of sensitising for oneself, and that ink-makers should make three standard inks which could always be depended upon.

Mr. SANGER SHEPHERD said plates were on the market which would give the three negatives without unduly prolonged exposure; and he thought it better to use such plates than to attempt any home-made manufacture, which would vary in every batch.

Mr. W. E. DEBENHAM protested against the assertion that yellow, red, and blue were primary colours. It was a common notion that they were primaries, because, used as pigments, all colours could be obtained from them; but, in that case, the process was one of subtraction from the white paper behind the pigment; whereas, in the consideration of colour on the screen, the real primaries were used, which was a case of addition.

Mr. MARTIN COHN replied to some questions asked in the course of discussion. He said fine etching would be necessary so long as half-tone was employed. Nothing would be gained by taking the three negatives simultaneously, for the successive exposures could be made very rapidly, and the method was quite satisfactory. He disagreed with the statement that there were plates on the market which obviated the necesity for sensitising oneself, because the sensitisers and colour filters must be selected according to the inks at one's disposal. From the commercial standpoint the primary colours were not necessarily the scientific primaries, but those which gave a result which proved commercially satisfactory.

Mr. GEDDES added a few remarks referring to some of the specimen prints, and the meeting closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 14,—Mr. Philip Everitt in the chair.

The HON. SECRETARY read a letter from Mr. York, in which he asked that the prints sent therewith should be examined by daylight, when it would be seen that they were stained in parts, for which he asked expressions of opinion as to the cause. Although, in the absence of daylight, the defects were not particularly obvious, an animated discussion ensued, based upon the information contained in the letter.

REVERSAL.

Mr. WRIGHT drew attention to a case of reversal in a negative which had received a treatment something like the following. Having been fully developed, the negative, apparently a good one enough, was placed to wash for ten or fifteen minutes, at the end of which time it was found to have undergone a fading action; it was fixed and redeveloped, and then exhibited the positive effect shown.

Mr. A. MACKIE passed round an almost identical example.

The CHAIRMAN considered it to be a case of under-exposure combined with forced development, and in this opinion Mr. Beckett joined. So far as the under-exposure went, further particulars pointed to such a state of things, and after a short discussion the matter dropped.

A Good Negative.

Mr. E. J. Wall opened a discussion on the definition of a good negative. The question, he said, could be answered in three ways. First, according to Messrs. Hurter & Driffield, who define a good or perfect negative as one which reproduces in silver the varying gradations of light which are reflected from the subject. The second answer might be according to Mr. Chapman Jones: A perfect negative is one composed of pure silver only, without any "mud." The third answer is that of the practical photographer: A good negative is that which will give what he wants. Personally, he did not care whether the negative represented correctly all the gradations of the light reflected from the subject, whether there was little or much mud, or whether it was all mud, as long as he got what he wanted. In the first place you have to consider the subject, which may be a landscape—extremely flat. By intensifying the contrasts in your subject, you may get a negative which will give a good print; on the other hand, you may have a subject which has strong contrasts, and, by reducing the contrast, get what you want. So it is necessary to give the subject consideration. For example, take a line subject, a diagram, something in black-and-white. You wish to copy it, but what would be a good negative for that class of thing would be totally wrong for a half-tone subject. For this reason it is impossible to define what is a good negative. Next comes the printing process to be considered. All printing processes do not yield absolutely the same gradation; that was very well known. In the few following lines is a list of printing methods approximately in the order in which Mr. Wall would use them. With a flat negative, and desiring a print strong in contrast, he would use the cold-bath platinum process. With a weak negative, for a strong print, he would take gelatino-chloride or collodio-chloride. Carbon or albumen would print fairly well in the case of a normal negative, and he ventured to think albumen was not yet dead. For a flat print from a harsh negative the hot-bath platinum paper would be preferable. In the event of having the option of using one paper only, his choice would be bromide paper. Any desired result could be obtained with this paper by using either slow or fast brands, exposing nearer to or farther from the source of light, and developing with stronger or weaker solutions, as the case may require. After what he had said, he did not see how he could possibly define a good negative, but every man must do that for himself. His own idea was, that it was one absolutely without bare glass anywhere, and yet without any absolute opacity. There were some schools in photography to whom a good negative implied one with absolutely nothing in it sharp. Others, perhaps, would consider the negative just passed round in the same light. Then the happy medium—some things sharp and some fuzzy, and the old school who wished to be able to read distinctly every sign or notice. However, he knew what he wanted and tried to get it, considering, first of all, what plate he was going to use (always a colour-sensitive plate), and then the question of the yellow screen, its use or not, according to the subject. He invariably took with him an exposure meter, estimating just one or two exposures to get the right gauge, after which he relied on guesswork with tolerable success. Coming to the development, he looked over his notes, if any, and then started to modify his developer accordingly. This was always now pyro, and metol, and carbonate of soda, and he knew exactly its capabilities. If necessary, he was not above intensifying or reducing, locally or altogether, and even faking on the negative. After all is done, and he has got a print which satisfies him, he says he has got a good negative. The practical photographer, be he professional or the man who amuses himself, seldom cares for the science of the subject, but tries for the negative which gives him what he wants, and this is the good negative.

After some discussion on the question of the alteration of the gradations in development, in which the Hurter & Driffield investigations took considerable part,

The Chairman agreed that every man was his own standard.

Mr. Welford exhibited some examples to show that the good negative was that which produced the good print. Some of them he thought might please Mr. Banks, and others not; but they all gave, when properly treated with the proper process, very good results. They included types of all kinds: hydroquinone, pyro-soda, and one of the dark-room-window variety.

Mr. Beckett asked whether Mr. Wall would match his bromide process against albumenised paper for adaptability to any kind of negative. He found the latter, suitably sensitised, gave every facility in this respect.

Mr. Wall pointed out that his remarks referred to ready-sensitised papers; but, if it came to sensitising by the worker himself, he should throw over every process but platinum. He was prepared to make this answerable to any class of negative whatever. It was possible to reduce twelve tones to four or five, or get the whole or intermediate numbers. He still thought, of the ready-sensitised papers, bromide was far preferable; but, no doubt, on the other hand, *i.e.*, sensitising at home, a lot could be done with albumenised paper. Platinum, however, was a long way ahead. In reply to the Chairman, who thought bromide paper would break down over a hard negative, Mr. Wall said a rapid paper exposed close to magnesium would give a flat result; but, as Mr. Beckett pointed out, there was the question of colour.

Mr. Rapson looked at the matter from the professional's point of view who has to please all comers. He may be called upon to print in any process, in summer and in winter, and with little time to waste; and he thought the yellow negative, even though it might give a good print in summer, was all that was bad. With a clear negative it was possible to get all the gradations one wanted.

PHOTOGRAPHIC CLUB.

October 13,—Mr. Lewis Medland in the chair.

This being the Convention night, there was an excellent attendance of members, conventioners, and ladies to see the lantern display.

Messrs. A. Bridgman and Sidney Keith were elected to audit the accounts in readiness for the forthcoming annual meeting.

Mr. Bridge had quite a record number of slides, considerably over two hundred, contributed by Messrs. W. G. Watson (London), Harvey George (Great Yarmouth), A. Brooker (Hastings), Sherborn (Newmarket), Catherine W. Ward (London), Sidney Keith (London), J. H. Walker (Leeds), G. Powell (Bath), W. M. Ashman (Bath), A. Bridgman (London), Godfrey Bingley (Leeds), A. Priestley (Egremont), F. W. Hindly (London), F. York (London), and F. A. Bridge (London). The display was quite up to the average Convention standard.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The annual business meeting was held in the rooms, 44, Mosley-street, on the 14th inst, the President (Mr. T. Chilton) in the chair.

The Hon. Secretary read the report of the retiring Council:—

In submitting this the forty-second annual report of the Society, the Council beg to draw your attention to the following short *résumé* of the year's work. There have been seven indoor meetings, three excursions, and an Exhibition (two nights). The Exhibition being on the March meeting night accounts for the meeting being short, and the August excursion not carried out accounting for the other. In November, 1896, Mr. H. M. Whitefield exhibited and demonstrated the use of an Incanto Acetylene Gas-generator, and Messrs. A. E. Casson and Harry Wade showed the results of their experiments with the negative paper of Messrs. Wellington & Ward. December: The meeting took the form of a discussion on Lantern-slide Making, the subject being introduced by Messrs. James Wood and W. G. Coote. January, 1897: Mr. F. Edwards brought before the members his apparatus for the Rectification of Converging Lines when enlarging architectural subjects. He also introduced the subject of enlarging. February: Mr. T. Morley Brook read a paper on *Figure Studies and Pictorial Photography*, followed by Mr. Harry Wade with a flashlight demonstration. April: Mr. A. E. Casson demonstrated on the Autotype Company's platinotype paper, also platinotype toning processes with two makes of gelatino-chloride paper.

The March meeting night was taken up, as being the first night of the Society's Exhibition. A charge for admission was made for visitors on both nights, and sufficient money was received from the sale of tickets to cover a great part of the expenses incurred therein. Mr. Casson gave a Lantern Exhibition on the first night, and Mr. James Wood on the second, the prize slides being shown on both occasions.

The meetings of May, June, July, and August took the form of outdoor excursions, the first and last of which, however, were not well supported.

The Lantern Section have during the winter months held monthly meetings as follows:—October, 1896: Slides exhibited at the Royal Photographic Society. November: Mr. A. Brothers, *Among the Fiords of Norway*. December: Members' slides. January, 1897: Messrs. S. L. Coulthurst and J. W. Wade. February: Mr. Hermann Woolley, *Two Journeys in the Central Caucasus*. March: Members' slides. These meetings have not been supported by the members and their friends as the Council think that they should have been. In point of numbers, the Society's membership roll has decreased. There have been twelve resignations and six new members, thus leaving a loss of six members during the year. There are at present seventy-six members.

The Society has now completed its first year's tenancy in its new quarters, and a more settled feeling seems to have prevailed.

The thanks of the Society are due to The British Journal of Photography and the *Manchester City News* for publishing reports of the meetings, and also to Mr. Harry Wade for reporting the same.

The Council would like some of the less active members to come forward during the coming session, and so relieve a few of the active ones, and at the same time to be a means of infusing new blood into the working of the Society. There is no doubt that, in the present advanced state of photography, it is a difficult matter to find something new to bring before the meeting; but, what with new processes, developers, makes of plates, apparatus, &c., there should never be a lack of interesting matter that any of the members might not bring forward.

In retiring from office, the Council trust that the members generally will do all in their power to support the officers, whom you will elect this evening, firstly, by coming forward with subjects for the monthly meetings; and, secondly, by doing their best to obtain new members to fill up the places of those who are constantly dropping out from one cause or another.

The Hon. Treasurer then presented his balance-sheet, showing a bank balance of 20*l*.

The election of the new Council then took place, resulting as follows:—*President:* Mr. Jas. Wood.—*Vice-Presidents:* Messrs. A. E. Casson, T. Chilton, F. Elwards, W. Tomlinson, and J. C. Wolfenden.—*Council:* Messrs. W. Blakely, J. G. Chapman, J. Evans, G. Grundy, W. Hughes, S. Knowles, J. Peddie, H. Wade, J. Wild, W. B. Wood.—*Hon. Librarian:* Mr. F. Edwards.—*Hon. Curator:* Mr. W. Tomlinson.—*Hon. Reporter:* Mr. J. G. Chapman.—*Hon. Treasurer:* Mr. W. G. Coote.—*Hon. Secretary:* Mr. C. H. Coote, 10, Holmefield, Sale.

Brixton and Clapham Camera Club.—October 12.—A show of animated photographs was given by the Prosser-Roberts Company of Camberwell, after which a discussion on *Under-exposure and its Treatment* was opened by Mr. J. Price. The discussion seemed to indicate smashing the negative as the best treatment; but, if this course was objectionable, pyro-metol or rodinal were likely to make the most of development.

Kingston-on-Thames and District Photographic Society.—October 6.—Lecture on

Photographic Advances of the Last Few Years,

which was read by one of the secretaries. Mr. Price, who also filled the hair, manipulated the lantern. The lecture was listened to with great attention, and much valuable information was derived from it on the scientific and commercial applications of photography. Thirteen new members were elected, and the names of several fresh candidates, read for the first time, stand over for election until the next meeting. The membership roll now numbers nearly ninety names as compared with thirty-five at the corresponding period of last year.

Richmond Camera Club.—October 11, Mr. Archer presided.—A lecture by Mr. T. C. Hepworth, entitled

PHOTOGRAPHIC ADVANCES OF THE LAST FEW YEARS,

was read by Mr. Alabaster, and proved to be exceptionally interesting, besides being admirably illustrated by judiciously selected slides. Among the subjects treated upon were process work, the so-called animated photographs, and the Röntgen rays.

South London Photographic Society.—At the last meeting of this Society, held at Hanover Hall, Hanover Park, Peckham, Mr. W. F. Slater (Vice-President) in the chair, Mr. Harold Baker's Affiliation lecture, illustrated by lantern slides, was read and discussed.

Bradford Photographic Society.—October 11.—Mr. H. Mortimer, of Halifax, delivered an account of a tour which he and some friends had taken in the Pyrenees, most of the travelling being done upon bicycles. Mr. Mortimer illustrated his remarks with over one hundred lantern slides made from negatives taken by himself with the hand camera during the pilgrimage, and some of these were much admired for their brilliancy and clearness, while the *naïve* way in which he described how and where the negatives were exposed created no end of amusement. At the close of the lecture Mr. D. Stevenson proposed a vote of thanks, which was seconded by Mr. G. R. Thistlethwaite. The chair was occupied by Mr. W. Halstead.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—The first meeting of the winter session was held in the Association's room, Arts Club, on October 12, Mr. John Watson (Vice-President) in the chair. Nominations were made for officers, to be elected at the annual meeting on October 26. The formation of a programme for the session was then proceeded with. The Association's premises have been newly decorated, and the dark room now adjoins the meeting room, which will conduce greatly to the comfort of members.

Preston Scientific Society (Photographic Section).—The Annual Meeting of the Photographic Section of this Society was held at the White Horse, on Monday evening, October 4. There was a capital attendance of members, and the chair was occupied by Mr. G. Rigby. The election of officers for the session resulted in Mr. J. Busby being appointed Chairman, Mr. F. Ketton, Secretary, and Messrs. H. Atherton, J. Atherton, C. E. Gray, C. Carter, and J. Marsden, and Dr. Derham, Committee. Votes of thanks were awarded to the retiring Chairman (Mr. H. Atherton), the Secretary (Mr. Ketton), and the Committee.

Scarborough Photographic Society.—October 12, Annual Meeting.—The report stated that sixteen meetings had been held at which papers were read on various photographic subjects, and illustrative examples were shown on the screen. A special lecture on Wensleydale was given by Mr. J. E. Little which was much enjoyed. A very successful excursion, under most favourable conditions as regards weather, was made to Staithes and Runswick Bay. The financial statement showed that fifty-three members had paid the annual subscription, leaving a balance in the hands of the Treasurer of 3*l.* 3*s.* Commenting on the report, the President alluded in appreciative terms to the exhibition of high-class photographs lent by the Royal Photographic Society, and the collection of pictures by Mr. J. Craig Annan, also the circulating lectures, which had proved very instructive and helpful. The election of officers for the ensuing season was next proceeded with, Dr. Frederick Dale being appointed President in the place of the Rev. W. T. Reeder, who is leaving Scarborough, and Mr. J. H. Rowntree, Vice-President. Mr. H. Wanless was elected Hon. Secretary, and Mr. J. G. Megginson Treasurer. The following members constitute the Committee: Miss M. McCallum, Miss Graham, Dr. Harvey, Mr. J. C. Thompson, Mr. J. Whitfield, and Mr. E. R. Cross.

Sunderland Photographic Association.—October 13, Annual Meeting, the President (Mr. William Milburn) in the chair.—The HON. SECRETARY (Mr. Charles E. Cowper) read the report of work done during the past year. The lectures during the winter season had been fairly well attended; outdoor meetings also fairly attended, &c. The HON. TREASURER (Mr. Thomas Walton) read the balance-sheet, showing a fair balance in hand. The rules of the Association having been read, the election of officers took place, resulting as follows:—*President:* Mr. William Milburn.—*Vice-Presidents:* Messrs. Charles E. Cowper and William Bartram.—*Council:* Messrs. William Pratt, W. Horan, G. Bartram, A. Peddie, R. G. Posgate, A. G. Bolton, E. R. Kirkley, and J. W. Broderick.—*Auditor:* Mr. W. C. Brown.—*Hon. Treasurer:* Mr. Thomas Walton.—*Hon. Secretary:* Mr. W. J. Pope, New Arcade, Sunderland. The Council have arranged to hold an exhibition (this month, in the Café, Fawcett-street) of pictures by some of the leading pictorial workers of the day, and also some by the Royal Photographic Society, and each evening during the exhibition there will be limelight lantern shows by the President and other members, also living pictures by Mr. R. G. Posgate. The Council have also arranged to hold several lectures during the winter season, which will be instructive, &c., to the members (lectures lent by the Royal Photographic Society). There will be several prize slide exhibitions, also compositions, slides, pictures, &c., by the members. Votes of thanks to the President, Secretary, and other officers, having been proposed and replied to, the meeting closed.

FORTHCOMING EXHIBITIONS.

1897.		
October 22–Nov.	Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 22–Nov. 13	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
November 1–6	Brixton and Clapham Camera Club.	C. F. Archer, 1, Gauden-road, Clapham, S.W.
November 16–18	Hackney Photographic Society.	W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.
,, 22–27	Ashton-under-Lyne Photographic Society.	The Secretary, Town Hall, Ashton-under-Lyne.
,, 29, 30	Durham City Camera Club.	R. Hauxwell, The Avenue, Durham.
December 9–11	Aintree Photographic Society.	
1898.		
January 17–22	Blairgowrie International.	Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
January–February	Photographic Society of India.	Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30	National Photographic and Allied Trades Exhibition.	A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14	International Photographic Exhibition (Crystal Palace).	R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE BICHROMATED GUM PROCESS.

To the EDITORS.

GENTLEMEN,—Your correspondent, Mr. Mansfield, may rest assured that what Mr. Maskell advises will not turn the carbon process upside down.

The saturation of the plain paper by the bichromate in solution *before* applying the pigmented gum is neither new nor revolutionary. Being addicted to bichromate poison when making my own paper, I am, through sheer necessity, obliged to saturate the plain paper with the bichromate before applying the other materials, and I believe with Mr. Maskell that I not only get a better paper, but much more sensitive.

The rationale is simply this, by saturating the pores of the paper with the bichromate, and the subsequent coating with pigmented gum, which greedily combines therewith, the full action of light is captured and secured to a larger extent than when only one solution is used, for the simple reason that the chromic salt is at the bottom of the film, and holds in its grasp every atom of insoluble matter that action of the light creates.

I have not had the pleasure of seeing Mr. Maskell's book, but I may say that my first photo-lithographic specimen, done in the year 1842, was made with gum arabic and bichromate of potash; I have also used the bichromate and gum in a state of fine powder with much advantage.—I am, yours, &c.,

JOSEPH LEWIS.

Dublin.

ON VARIOUS SUBJECTS.

To the EDITORS.

GENTLEMEN,—I was intending writing to you last week, but was so busy I could not find the time; seeing your notice about a photographer of world-wide reputation being so void of business, and seeming rather jealous of the provincial one you spoke about the week previous being so busy, perhaps he would like to hear of another provincial photographer being extraordinarily busy, as I am.

I opened here at the beginning of this year, and did not know a single person, had been managing a high-class business in the Midlands, and, in spite of three other photographers being in the same street, I can get as many as nineteen lots of sitters in a day, and at good prices. My maxim is good work at moderate price (18*s.* a dozen cabinet vignettes), and keep your promises with your customers, and turn out your work as quickly as possible. This year has been to me a wonderful year for business, so can hardly understand how this high-class man should be without sitters.

While I am writing, I would suggest to that correspondent, Mr. E. Penfold, that if he makes a pad of wash leather, and wipe the P.O.P. prints over after they are mounted, they will adhere to the mount and be perfectly clean; of course, the leather must be wet, and the prints will require no further rubbing down.

Re Interior this week (W. & Co.) cannot they block the window up by tacking brown paper on the window frame inside, or else paste tissue paper on the glass, this I have found most effective.

Re Retouching at Night, Marions supply a splendid lamp for 5*s.* 6*d.* complete especially for it.

Re Lantern Smelling, if Mr. S. Todd would try keeping it strictly clean about the wicks, and also steep the wicks in ordinary vinegar, and allow to dry before placing in lamp again, this I find does away with all smell, and gives a very clear light.

Hope you will pardon me bothering you about these little things, but felt I must write and give my humble experiences.—With compliments and thanks, I am, yours, &c.,

F. W. TASSELL.

Devonshire Chambers, Devonshire-street, Carlisle, October 10, 1897.

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—In looking carefully at the Salon and the Royal Photographic Society's Exhibition this year, one is, I think, bound to admit that the latter displays both better work and better taste. And why, oh! why, after four years, should the unobtrusive and artistic draping and hanging at the Dudley Gallery be exchanged for a study in drab, on which stand out specimens of the "obscure and unbeautiful," to say nothing of "ideas" for the photographic poster, with utter disregard of fitness, talent, or beauty?

Why should the place of honour be reserved for a foreigner, whose many specimens of inferior merit crowd the line, while the work of such men as Robinson, Horsley Hinton, Craig Annan, Hollyer, Crooke, and others, is scattered in obscurity?—I am, yours, &c., P. S. LANKESTER.

Great Hall Studio, Tunbridge Wells.

To the EDITORS.

GENTLEMEN,—The Linked Ring, for the sake of themselves, ought really to consider whether the ground on which they found their existence has not been cut from under them by themselves; and whether, judging by the present Exhibition, instead of living down the opposition, as they claim to have done, they have not rather been living down to it.

Their early idea was to leave to Pall Mall all matters of "process" as their proper sphere, and concern themselves solely with results.

The artistic decorative effect of a photograph is not entirely dependent on the width or quaintness of the frame; but, remembering this, look round the room at the Dudley Gallery, what are the results? How many—how few rather—of the results can claim to be artistic, either decoratively or otherwise? Of those few it is pretty safe to say they either follow in the old ways as to process, showing indeed great manipulative skill and considerable artistic feeling, or the process adopted produces someting so closely resembling the results of manual work in other branches of art as to go far to dislodge the Linked Ring from their position, viz., that the realm of art which photography can claim as its own is new and peculiar to itself; to let photography lose its individuality is to give up the game.

The assumption that photographers should themselves be capable of fixing the standard of merit of their own pictorial work, without appealing for assistance to experts in "other arts," is surely a little dangerous. There should be no plural to the word Art. Are they, after all their bravery, wincing under the criticism of former years? "Art?" say they, in the Napoleonic formula; "Art? Photography is art!"

They are to be thanked for the impetus they gave to artistic photography; and the former exhibitions, with some twenty pictures in this Exhibition, clearly show that their courage was justified; but, to maintain their position, they must be prepared to select and reject without fear or favour.—I am, yours, &c., TRAVERS J. BRIANT.

39, *Studley-road, S.W.*

To the EDITORS.

GENTLEMEN,—Has it, I wonder, ever occurred to "Cosmos" that the things that have been greatest are just those that have received the least notice or excited the most ridicule at the time? John Milton sold for 40*l.* *Paradise Lost;* Tintoret painted some of his masterpieces for the cost of colours and the sake of fame, because he could not obtain commissions at all if he charged for his services; Browning's work was ridiculed and his public recognition retarded at least ten years by an ignorant and inappreciative critic, whose critique consisted of one word—"Balderdash;" Mr. Ruskin pointed out the beauty and subtlety and truth of much of Turner's work years before that work occupied the place in public estimation which it now holds; and the greatest Teacher the world has known was scorned and ridiculed, and, humanly speaking, His life was a complete failure, yet how far-reaching are the effects of that life on our modern civilisation!

"Cosmos" appears to think that the criticism of certain of the newspapers which cater for the non-photographic public is to be taken as the measure of success which the Salon has achieved. I have always thought English justice demanded that a man should be judged by his peers, and no one will maintain that the ordinary individual to whom the critics of the dailies appeal is the artistic peer of the men who contribute to the walls of the Salon. Probably no one would appreciate all the works hung—tastes differ; but there is a greater probability that each work represents earnest endeavour on the part of the photographer, and all earnest endeavour demands our respect. I think it was Carlyle who said the critics were the men who had tried and failed, and it is much easier for "Cosmos" to indulge in fancied smartness, in cynicism, sneer, and ridicule than it is to produce the works he sneers at. I should like to suggest that "Cosmos" and others who ridicule the Salon should read what the late Professor Blackie wrote on sneering and the "cultivation of the barren graces of the *nil admirari*."

One can hardly help wondering that you should publish "Cosmos's" suggestion that Mr. Coe's defence of the Salon is a bid for election into the Linked Ring. It would be difficult to imagine an imputation more insulting to Mr. Coe and to the integrity of the Salon Committee. A man may have a right to express his opinions on art and on photography, but he has no right to impute ulterior motives.—I am, yours, &c.,

C. H. HEWITT.

Catherine-terrace, Gateshead-on-Tyne, October 19, 1897.

SPECIMENS—THE ROYAL AND THE SALON.

To the EDITORS.

GENTLEMEN,—The question of the return of specimens is one that has always interested me, and on more than one occasion I have seen prints from the same negative exhibited in different show-cases, but the photographer who takes the cake in this particular game of cribbage is one living not a hundred miles from Liverpool; his show-case is filled with specimens of bromide and other prints taken from THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC and other year-books. What do you say to that?

Apropos specimens, "How is it that thare hangs in a photographer's show-case, at Camberwell, a print exactly like one now hanging on the walls at the Royal, and both under different names?"

And now a word about "Cosmos." I agree with him as a rule, but this year I have a picture hung at the Salon, and I cannot allow his remarks to pass. I am proud of my picture, and I now intend calling myself a "high art" photographer, for have I not earned for myself that title? My picture has a history, rather a romantic one, I think. I will tell you the story:—I have a friend whose name is well known on the art side of photography, he puts his heart and soul into the thing. One day he was very busy, and he asked me just to drop in, if I had a few minutes to spare, and develop a few plates he had exposed. Personally I am very fond of developing, and he knew it. His dark room is in the top part of a building, in the basement of which is a gas engine that drives a little machinery underneath my friend's office. There were six plates to develop, and I was beginning the fourth when my friend came up just to see how I was getting on. "Oh, look here," I said, "every blessed one of them helplessly fogged, what on earth have you been up to?" "Oh, I haven't fogged them," he said, "Well, look here," I said, "you stay while I do the next two." The fifth was also fogged. I was about to begin the sixth when my friend began, "Do you know I have an idea, I really do believe the fogging is caused by the constant jar of that gas engine. I am not very good at chemistry, but it strikes me there is a chemical action caused by the constant vibration—any way I'll go and see if Brown will stop the engine for a few minutes while we develop the last plate." The engine was stopped, and we proceeded with the development, but it was no good, the plate was fogged—if anything, worse than the others. My friend Smith was disgusted, and threw them in the dust-bin; but, when his back was turned, I took them out and put them in my pocket, as I wanted the glass for my cucumber frame. My little son—an intelligent lad of three summers—however, got hold of the negative, and, with some old, discoloured matt paper I had thrown away, played at making pictures. One print I thought very effective, so I simply fixed it, &c., and now, I am proud to say, it hangs at the Dudley Gallery—wrong way up, but that's a minor matter. After all that trouble, don't I deserve to be hung?—I am yours, &c., P. R. S.

P.S.—My friend Smith is looking out for a dark room that has no gas-engine within a mile. If you hear of one, you might let me know.

THE RETURN OF SPECIMENS.

To the EDITORS.

GENLEMEN,—In reply to "Critic's" letter, published in your issue of October 15, may I, as an old reader of the JOURNAL, suggest the revival of the "Black List," which you published some years ago. I am sure from the many letters which you have so kindly printed from time to time, detailing the sweating, bullying, and non-return of specimens, that if you could see it in your power to revive the "Black List," the firms who are at present a terror to assistants would soon be made to feel their positions. I have had, I am sorry to say, like many other assistants, a bitter experience while in the employ of a London firm, and whose name I enclose, and which should be placed on the list.

To publish the names of such firms is the only way to bring them to book, and so bring about a satisfactory settlement of this question, and so place the vast army of photographic assistants upon a more humane condition.

Could not Mr. Randall, who has used his pen so often on behalf of assistants and their grievances, do something to bring this matter to a head? Trusting you will consider, Gentlemen, the question of the revival of the "Black List," and thanking you for always opening your columns to ventilate any just grievances,—I am, yours, &c.,

October 18, 1897. LATE 9 TILL 8.

[We will keep our correspondent's suggestion with regard to the re-establishment of the "Black List" before us. The idea was originally availed of some eight or nine years ago, but it fell through owing to the apathy of those on whose behalf it was put forward.—EDS.]

THE SANDERSON CAMERA—A CHALLENGE.

To the EDITORS.

GENTLEMEN,—You will pardon my trespassing upon your valuable space if in so doing I can protect the credit of the gentlemen who came to Cambridge, last May, to witness some tests made with the camera which bears my name.

It has just come to my knowledge, through one of the largest photographic dealers here, that a gentleman, the inventor of a special camera, recently paid a visit to this town, to introduce his invention. I am given to understand that he points to the results with which my camera was credited as having been from "faked" negatives, and also that I had used a lens of much greater covering power than was used on the other cameras taking part in the tests. He also advances the information that this opinion is largely shared by the London Photographic Clubs.

The "faked" test photographs referred to (reproductions of which were produced by this gentleman) were those of the West front of King's Chapel, which illustrated the report of the event in the *Photogram* for July last.

I think I have a right to speak on behalf of all concerned, more especially as Messrs. George Houghton & Son, the promoters of the test, took every precaution against any chance of fraud by inviting some of the best known gentlemen in the photographic world, who I am sure would have been the first to expose the whole thing had it not been *bonâ fide*, and I can only trust that the names of those gentlemen, which were published in the leading photographic journals will be a sufficient guarantee to your readers of the genuineness of what took place here.

If there is any doubt in the mind of the gentleman herein referred to, I herewith challenge him to duplicate the result obtained with my camera under the same conditions with his camera and the lens used by me, and, should he succeed in doing so to the satisfaction of a competent board of Judges, I will pay to the said Judges the sum of ten pounds, to be devoted to some deserving object (photographic or otherwise), on the condition that he shall forfeit a like sum should he fail to do so.—I am, yours, &c., F. H. SANDERSON.

48, *Bridge-street, Cambridge, October* 11, 1897.

THE METRIC SYSTEM.

To the EDITORS.

GENTLEMEN,—I am glad to see that Lord Crawford has, in his annual address to the Photographic Society, advocated the use of metric weights and measures by photographers. Cordially agreeing with him in his object, I wish to point out that he has not been able to avoid the confusion arising from our two ounces.

First, let me remark that the troy ounce of 480 grains is not now used by those who deal in drugs; it is purely a bullion weight, and the ounce as supplied by our weight-makers is the avoirdupois one ot 437·5 grains. Again, the gallon contains 160 fluid ounces, and as it also weighs 10 pounds of water, at the normal temperature, it follows that the fluid ounce weighs exactly the same as an avoirdupois one.

One grain to an ounce in a solution therefore corresponds to $\frac{16}{7}$ grammes to a litre of 1000 cubic centimetres. Sixty grains in a pound of water, in the formula first translated, thus corresponds accurately to 8.57 grammes per litre, and not 7·812. The error arises from having assumed that the ounce consisted of 480 *grains*. The confusion is an outcome of the adherence of the weight-makers for the photographic dealers to the (disused) apothecary's weight. If a grain were the weight of a minim of water, Lord Crawford's estimate would be right. How long the English people will continue to use weights and measures so liable to cause error as ours is a question for themselves. Let photographers avail themselves of the liberty which the new Act of Parliament gives to them and join all scientific men out of Britain and all, with a very few exceptions, in it.—I am, yours, &c., J. F. T.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

L. G. Maclean, Market-place, North Walsham.—*Photograph of the interior of old schoolroom at Paston Grammar School, showing place where Nelson sat at school.*

B. DUNN.—We believe that dry ferrotype plates are to be obtained at Fallowfield's, Charing Cross-road.

EDWIN.—Better consult the formulæ section of the ALMANAC; such information as you require is given there very fully.

FRED MORLEY (Lafayette, Ind., U.S.A.).—Dr. Rudolph's address is Jena. The number you mention is long since out of print.

F. A. JOHNS (Birkenhead).—We can give no further information on the subject. We do not answer questions through the post.

TONES.—W. STONER. The cold tones you desire may be obtained by the platinotype process, or the bromide process. You will not be able to obtain them with ready-sensitised albumen paper, or P. O. P.

BARYTA.—According to an advertisement on p. 24 of the ALMANAC for 1897, Messrs. Otto König & Co, of 27, Cross-street, Finsbury, E.C., are the agents for Steinbach & Co.'s baryta paper. We can give no further information.

ARTIFICIAL IVORY CELLULOID.—The firm you have tried make it, but we believe they only supply it in wholesale quantities. Try Guiterman & Co., 35, Aldermanbury, E.C. If you cannot get it there, we are unable to say where you can obtain it.

INSURANCE. — LEEDS. We should say, under the circumstances, that the proposed increase of the premium is not warranted. Try another office—say the Westminster, which is credited with being very liberal with photographers in the matter of premiums.

CARBON TRANSPARENCIES.—R. WICKS. The markings complained of are by no means uncommon in carbon transparencies that contain a large quantity of pigment in proportion to the gelatine. Coat them with plain collodion, and the marks will not then show.

SPOTS ON PRINTS.—N. W. The mounts are printed in bronze powder, and a close examination shows that particles of the powder are adhering all over the mounts. But there are other causes that produce spotty prints, therefore we cannot say that the bronze is the actual cause in this instance.

MOUNTANT.—A. J. BLISSARD. The mountant mentioned is a trade preparation, and its composition has not been published. We cannot, therefore, give the formula for its manufacture. For the same reason we can give no opinion as to the probable effect it may have on photographs mounted with it.

EARLY PHOTOGRAPHY.—C, A. W. If you want information on the early processes of photography you had better get Hunt's *Manual of Photography*. It has long since been out of print, but copies are often to be met with on second-hand bookstalls. Failing that source, an advertisement would probably bring one.

YELLOW MARKINGS.—T. BULL. The yellow stains are clearly due to the prints being allowed to stick together while in the fixing bath, so that the hyposulphite solution did not have free action. The stains cannot be removed now. In future, keep the prints in continual motion while they are in the fixing solution.

FILMS.—C. H. The peculiar smell of which you complain is due to the celluloid itself, and not to antiseptics added to the gelatine emulsion as you surmise. The solvents used for the solution of the nitro-cellulose, of which the film is composed, are all more or less odorous, and take a long time to entirely evaporate. The smell of pear is due to amyl-acetate. Camphor is also present.

TRANSFER.—T. C. N. (Ballymena). We presume you require transfer paper, such as that employed by lithographers. If so, you will find it better to purchase it than attempt to make it yourself. It may be obtained from any of the dealers in lithographic materials. Messrs. Penrose & Co., Upper Baker-street, W.C., or Winstone & Son, Shoe-lane, E.C., will, doubtless, supply what you require.

SOLUTION.—C. HOWE. A saturated solution is of varying strength, according to the temperature. What may be a saturated solution at one temperature may not be so at another. Saturated solutions are not often quoted in this country, though they often are on the Continent, more particularly in France. You will find a table in the ALMANACS that gives the solubilities at a certain temperature, which are the points of saturation at that temperature. But you had better adopt definite proportions instead of relying upon "saturated solutions."

SPOTS.—CONTRIBUTOR says: "Will you kindly tell me the cause of the spots and stains on the enclosed print? I have tried a clearing solution and a potass-ferricyanide solution on the negative whence the evil arises, but with no result, although the negative is, apparently, now quite spotless. I have never had this before. I am under the impression that in examining the print, whilst printing, I spat some saliva mixed with tobacco of the cigarette I was smoking at the time. Is there any remedy?"—If all the prints are spotty like this—that is the spots appear in the same place—wash the negative well, and then dry and varnish it. We should then expect the evil will be remedied.

COPYING PAINTING.—A. LÉVY writes: "Could you give me a satisfactory answer to the following: I am asked to take two negatives of a painting (a portrait). I took them, and in both the same defects appear—spots on the face and neck, due probably from two different colours used (red), which difference is not apparent to the eye? Can this be naturally cured on the negative? By natural I mean directly in the taking of it, and not by retouching. Will isochromatised plates cure this? I think not."—Without seeing the painting and the negatives it is impossible to say definitely. Orthochromatised plates will certainly help, particularly if used with suitable colour screens. To get the best possible results, it may be necessary to prepare the plates specially for that particular picture. That is frequently done by the leading art reproducers on the Continent.

TAKEN ON AN "EXCELSIOR" PLATE.

EXPOSURE $\frac{1}{150}$ Second, F/16.



Negative by B. J. EDWARDS.

FOR PARTICULARS SEE OPPOSITE PAGE.

B. J. EDWARDS & CO., HACKNEY, LONDON.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1956. Vol. XLIV.—OCTOBER 29, 1897.

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EX CATHEDRÂ.

The most notable event in photographic circles during the past week has been the opening of the Eastman Exhibition at the New Gallery in Regent-street. With characteristic enterprise, the Company appear to have spared neither trouble nor expense to make the display not only creditable to themselves but to the art and industry of photography. If the Exhibition may, in a sense, be regarded as the apotheosis of film photography, it also illustrates other branches of work in an astonishingly complete manner. There is something to appeal to all photographic tastes in the Eastman Exhibition, and we trust that a large attendance will reward the efforts of the Company to popularise photography by such a beautiful and instructive exposition of its many possibilities as they have organized at the New Gallery.

* * *

The following notice relating to acetylene appeared in the *London Gazette* of October 19: "Explosives Act, 1875.—Notice is hereby given that, after the expiration of forty days from the date hereof, it is proposed to submit to Her Majesty in Council, in pursuance of the above-mentioned Act, the draft of an Order in Council declaring acetylene, when liquid, or when subject to a certain atmospheric pressure, and when not specially exempted by an order of the Secretary of State, to be an explosive within the meaning of the Explosives Act, 1875, and prohibiting its being manufactured, imported, kept, conveyed, or sold."

* * *

Last week we announced that the Autotype Company received the award of the Grand Prix for their exhibits at the Brussels International Exhibition. The Company have since sent us a picture in half-tone of their exhibits as they hung in the Gallery. Besides reproductions of well-known paintings by Turner, Greuze, Henry Ryland, Sir Joshua Reynolds, and others, Autotype enlargements from negatives by Bulbeck & Co. (*South Processional Aisle, Winchester*), Paul Martin (*The Alhambra Theatre by Night*), Byrne & Co. (*Studies of Children*), Major Nott, and other photographs familiar to Exhibition-goers were included in the display, which was evidently a very fine one.

* * *

In opening a new picture gallery at Reading last week, Lord Herschell delivered an address, in the course of which he made one or two observations on criticism in art, which, as they are not inapposite to photography just now, we here reproduce. "By gazing upon good pictures," he said, "they learned to see more in nature than they ever saw before. It was not always what was generally called the picturesque that impressed them most. The tendency of art critics nowadays was to discover that, if an artist was able to please a large number of people, his art must be very poor; that the real artist must so paint that only a limited number of people could appreciate him. The same applied to musical criticism. His idea was that art of every kind was very various, that it appealed to many sides of our nature. He did not mean to say that there was no such thing as false sentiment, or false sense of art, but he did urge them to judge somewhat for themselves. There were beauties which the artist's eye only could see. On the other hand, while he saw defects, the public had a certain advantage over the critic in their wider appreciation."

* * *

Hot-weather troubles have long since ceased to have the terror for photographers that they formerly possessed. We are reminded by a note in a recent number of the *Journal of the Photo-*

graphic Society of India that our Indian brethren, in hot weather, carry on their dark room work under exceptional difficulties. "The troubles of developing in a dark room in hot weather," we are told, "are at least mitigated by the punkah. The absence of twilight, too, is a not infrequent advantage. An hour before dinner can often be profitably spent in the dark room with windows freely opened, and ice is plentiful enough in most stations. The deterioration of chemicals and speedy deliquescence of salts is a constant source of difficulty and expense to the worker. If the dealer loses heavily in stock from the same cause, he at least has the advantage of free and rapid sales, the amount of chemicals sold by him being probably six times the amount needed if his goods had more lasting properties. With regard to the photo-mechanical processes, collotype work is now practically given up in favour of photogravure, as being the more easily manipulated process in this climate."

* * *

Mr. E. Dockree, who has had the task of organizing the Invitation Section of the forthcoming Exhibition of the Brixton and Clapham Camera Club, to be held at the Clarence Rooms, Brixton, November 1 to November 6, informs us that the following gentlemen have accepted invitations to contribute examples of their work: Messrs. Bernard Alfieri, Craig Annan, Harold Baker, A. Burchett, W. Crooke, George Davison, A. Horsley Hinton, Karl Greger, Fred Hollyer, H. P. Robinson, J. A. Sinclair, and J. B. B. Wellington. Twelve was the chosen number of workers. We congratulate Mr. Dockree and his Committee on the wisdom and discretion of their choice. A collection of photographs by twelve such men cannot fail to form a highly attractive and informative feature of the Brixton Exhibition.

* * *

The Natural Colour Photographic Company, Limited, of 36, College-green, Dublin (Professor Joly's process), inform us that they are now in a position to offer a limited number of screens for photographing in the colours of nature, in sets containing one taking and five viewing screens. A brief but clearly written pamphlet, descriptive of the process and the method of using the screens, is also issued.

* * *

The Reliance Dry-plate Company is the title of a new firm which intends devoting itself to the manufacture of gelatine dry plates and rollable film for the cinematograph. The premises of the Company are situated at Oakleigh-park, N. Mr. W. Cobb, who has had many years' experience in the preparation of gelatine emulsion, is at the head of the Company.

* * *

We are glad to hear that the principal provincial firms of photographic apparatus makers are extending a hearty support to next year's International Photographic Exhibition, to be held, under the auspices of the Royal Photographic Society, at the Crystal Palace. Already, 3000 square feet in the Apparatus Section alone have been taken, although the applications have not been officially dealt with. An important exhibit from Greenwich Observatory will form a feature of the Exhibition, the prospects of which are looking decidedly promising.

* * *

The Council of the National Photographic Record Association are issuing an appeal for support in bringing together a national record of all existing objects of interest, as well as scenery, life, customs, and history of the time. They point out that photographers and others can assist by contributing photographs (which must comply with the regulations set forth in the by-laws), or by acting as Hon. Agents and Collectors in their repective localities. The Council also look for generous support from photographic and camera clubs throughout the country, as well as from individual amateur photographers. The Council wish it to be understood that there is no thought of competing or clashing with the excellent work of the same kind which is being done by the several County Photographic Survey Associations, such as those of Warwickshire, Worcestershire, Yorkshire, Cheshire, &c., but rather a hope is entertained that such useful work may be encouraged by loans being made from time to time from the National Collection, before being deposited in the British Museum, of interesting pictures from other localities for the purposes of exhibition.

WARM TONES IN COLLODION LANTERN SLIDES.

Allusion was made, in an article on *Development and Toning* a few weeks back, to the fact, well known to the users of collodion plates, that the application of a weak and well-restrained developer in conjunction with a more or less protracted exposure usually results in the production of warm tones. We say "usually," because, as a matter of actual experience, many of our readers may have discovered that such is by no means invariably the case, for, unless the plate is of such a character as to admit of what really amounts to over-exposure, the only result will be a thin, flat image, veiled in the lights, and heavy and blocked up in the shadows.

It is well known to practical workers that warm tones obtained in this manner are only to be secured upon slow, or comparatively slow, plates; but, as a rule, the slower the plate, the more easily does it lend itself to the production of a wide range of tones. This, however, is scarcely a sufficient explanation of the circumstance, as it in no way describes the manner in which the conditions operate upon a slow plate when, with a more rapid one, proportionately over-exposed and correspondingly restrained in development, they altogether fail. On the other hand, slowness, *per se*, is not necessarily an infallible element in the successful production of warm tones, for a collodion emulsion that has proved itself incapable of rendering anything but black tones may be made many times slower by the addition of soluble bromide or other means, and yet prove not one whit better.

The fact is, in considering this subject, one very important element, if not the most important, is usually overlooked, namely, rapidity of development. Those who are familiar with the working of collodion plates must have noticed that, whatever the character of the film as regards rapidity and the ultimate colour of the developed image, the first faint signs of development invariably show a warm tone, which, as development proceeds, passes more or less rapidly into the grey or black stage. The same thing probably happens in a modified degree with gelatine, but in the light usually employed for gelatine plates it is not so readily recognised as in the case of collodion. Now, with a plate properly suited to warm tones, whatever the exposure may be, if the development is correctly adjusted to it, the action proceeds as rapidly as if a normal exposure and development were used, the only difference being in the colour of the final image; but, with an unsuitable film,

if the development be sufficiently restrained to hold the half-tones and shadows in check, the action is so slow that the image, although possibly warm in colour to start with, passes into the grey stage long before development is complete.

In accounting for this difference of result, we must look, first of all, at the sensitiveness of the preparation, and, secondly at the molecular condition of the silver bromide, independently of the effect which that condition exercises upon the sensitiveness. We believe we are stating an invariable fact when we say that, as the general sensitiveness of the plate increases, whether it be collodion or gelatine, so does its scale of gradation decrease; or, to put it in another way for our present purpose, the disparity between its sensitiveness to powerful and to feeble light becomes less. In the case of a film possessing a high degree of sensitiveness—we speak now comparatively, and the remark applies equally to collodion or gelatine—if we give a normal exposure and use a normal developer, we get, we will say, a result that shows perfect gradation from the lights to the lowest desirable shadows; but, if we take another plate, two, four, or ten times as slow, and expose it sufficiently long to give an equal result as regards the high lights, we shall have an entirely different scale of gradations in the half-tones, and especially in the shadows; the result will, in fact, be under-exposed.

If two similar plates be now exposed for double or treble the respective periods, and the development so modified as to give the best result possible with each, we shall find that, while with the slower plate the outcome is an improvement, with the other we shall experience a constantly increasing difficulty, in proportion to the increase of exposure, in preserving the due gradations of the image, and preventing the half-tones and shadows from gaining, as it were, upon the high lights. The action of soluble bromide in the developer has been shown to be to retard and not to arrest development; and, if we, in the case of the rapid plate, decrease the strength of the pyro or reducing agent in order to avoid too great density or too energetic action, the result will be that, whereas the high lights soon arrive at a fixed point, beyond which the solution is incapable of taking them, the half-tones and even shadows will go on increasing in strength, and so destroy the correctness of scale.

If we apply this method of treatment to transparency purposes, we find that, with the rapid plate, the extent to which the exposure can be increased without losing gradation altogether is extremely restricted, owing to the ease with which, in spite of any increase of restrainer, the half-tones encroach upon the shadows and the lights become veiled; in fact, the power of modifying the tone in this manner may be said to be non-existent.

But, with the slow plate, and we speak now especially of collodion, the increase of exposure is in every way beneficial, since it affords the opportunity of bringing out the more feebly impressed portions of the image without any forcing, while the greater "latitude," or the disparity, between the action of strong and feeble light, offers a far wider range of extension.

But, in order to secure the advantages arising from over-exposure, we must have rapid and simultaneous development over the whole range of tones, not the usual gradual action, commencing with the more strongly impressed portions. In order to arrive at this, we must have the film acted upon throughout its whole thickness in those parts that constitute the image. Then, when the developer is applied, its action commences instantly and simultaneously in both shadows and lights, and must be stopped long before it is anything like complete, and before the restrainer present has lost its power to keep clear those portions of the film that are not to be reduced.

This condition of things can only be secured by a thin, transparent film, in which the silver bromide is in an extremely fine state of division, and this is precisely the description of the collodion plates that are used most successfully. In the case of either wet collodion or emulsion films that are dense and opaque warm tones are extremely difficult, if not impossible, to obtain, and those gelatine plates which prove capable of giving an approach to warm tones are, without exception, slow and fine in grain.

We are told that warm tones with collodion emulsion plates are more rare at the present day than formerly, and the above, no doubt, explains the fact. The up-to-date collodion emulsion made for speed is comparatively coarse in grain—not so coarse as gelatine, but sufficiently so to present considerable resistance to the passage of light and development. Some washed emulsion we have been recently using refuses to show an image at the back of the plate, no matter how long the development is continued. Even an unwashed emulsion, *not* made for speed, attains a certain amount of coarseness or aggregation of the particles in the course of keeping, technically known as "creaminess of film;" whereas, when freshly made, and for some hours or a day or two afterwards, it is so transparent as to be almost invisible in the dark room when dried upon glass; and this is the condition in which the earlier workers used it and in which it gives the much-desired warm tones if properly exposed and developed. Mr. Mawdsley's method of working, alluded to in an article by Mr. W. B. Bolton last week, no doubt, owed the special quality of its results to the infusion of new, fine emulsion introduced by the daily re-sensitising.

That the warm tones produced in this manner partake of the character of solarisation is, we think, undoubted. The late Charles Breeze, in some of his famous stereoscopic slides representing sunset scenes, obtained similar results—almost blood-red in tone—by greatly over-exposing the cloud negative and developing with very weak pyro and silver.

Acetylene and Insurance.—At present the only alteration we hear of in regard to new regulations from the Fire Insurance Committee, as referred to in our last, is as regards the amount of carbide permitted to be stored—by traders in the apparatus and carbide only—which is now increased to five pounds, with a minimum purity of ninety-eight per cent.

Explosibility.—The explosive properties, under various conditions, of this gas continue to be studied by MM. Berthelot & Vieille, and it cannot be said that their results present it under any safer aspect than has hitherto distinguished it. It is always desirable to bear in mind the essentially different character of acetylene compared with ordinary coal gas. The only danger of explosion from the latter arises when it is mixed with atmospheric air or oxygen; when compressed, it is just as safe as oxygen. But with acetylene it is quite different, for, being what is termed an exothermic compound, that is, one that gives off heat when decomposed—it is akin to nitro-glycerine—it is capable, under certain conditions, of decomposing with great violence without any admixture whatever with oxygen, and, when liquified or compressed, can be exploded, even without heat. Nothing can take from it its exothermic character; all that can be done to minimise its danger is to ensure the absence of any but the slightest pressure.

Mixed with Acetone.—It is capable of dissolving in this liquid, and, at a temperature of 15° C., under absolute pressures of 7, 12, and 20·5 kilos, it was found that there was dissolved per kilo of pressure from 23 to 24·6 volumes. Pressure of 10 kilos produced a harmless solution when an incandescent wire was placed above the liquid, or when a fulminant was exploded. When, however, the pressure in dissolving was raised to upwards of 20 kilos, decomposition took place, with production of several thousand atmospheres of pressure.

The result of these and other experiments went to show that it is not possible to fix a limit below which propagation of explosive force will not take place, and above which it certainly will take place. The probability of an explosion increases continuously with the pressure. For practical purposes, it would seem that there is very little danger of explosion by ignition when the pressure does not exceed the normal by more than 520 mm., and of explosion by detonation when the pressure is not more than 170 mm. above normal.

Meteor Showers.—We have on a former occasion referred to this topic, and those who have any thoughts of taking the matter up will have their work facilitated by reading a pamphlet, by W. F. Denning, which has just been published. It is a reproduction of a series of articles (by Mr. Denning) in the *Observatory*, and is illustrated.

The Largest Telescope in the World.—On Thursday last week the largest telescope in the world, which has taken years to construct, and has been installed at Chicago, was formally presented by Mr. Yerkes to the Chicago University, and accepted on its behalf by President Harper. This magnificent present by Mr. Yerkes, the railway magnate, beats the record of all large telescopes, and great things, photographic and otherwise, are expected from it by astronomers.

Forthcoming Exhibition at Glasgow.—An Exhibition of an international character is to be held at Glasgow in 1901, and it is announced that the guarantee fund has already reached 200,000*l.* If the same energy and enthusiasm are brought to bear upon it that was the case with the recent photographic exhibition, there will be little need for a guarantee fund. The financial result of Glasgow's photographic show must be a matter of envy to the most pretentious of photographic societies, as we said last week.

Multitudinous Applications of the X Rays.—According to a paragraph in the *Standard*, the X rays have had a curious result in Paris. It seems that the authorship of a painting was in doubt; so it was "radiographed," whereupon the great artist's name (Albert Dürer) was discovered beneath the accumulated dirt of many years, thus establishing the authenticity of the picture. This may have been the case; but, if it was, there is no novelty in it. If we mistake not, we have read more than one similar report in the lay press as to the Röntgen rays revealing the names of artists', hidden signatures on old paintings, as well as other more or less extraordinary things in connexion with the X rays.

The Royal Society of Painters in Water Colours.—Who is to fill the Presidential Chair of the Royal Society of Painters in Water Colours rendered vacant by the death of Sir John Gilbert, R.A.? According to the *St. James's Gazette*, it has been offered to Mr. Alma Tadema, R.A., and to Sir E. Burne-Jones, but both these gentlemen have declined to occupy it. However, it adds that the choice of the Society will, it is believed, fall upon Mr. Hubert Herkomer, R.A. Mr. Herkomer, it will be remembered, is, or was, the exploiter of an engraving process, although, but a brief period before, he decried all photo process work as a "hideous thing amongst us." Since then the public have been enabled to judge, from the few examples published, of the results by Mr. Herkomer's process and that of photogravure.

The Paris Bazaar Fire.—The lamentable cinematograph accident in Paris is not to be forgotten, for, last week, it was made a peg on which to hang a paper before the Architectural Association. The paper, however, had nothing whatever to do with the cinematograph, but to the structure, and similar ones, in which entertainments generally are given. The cinematograph, under its many titles, has, in a very short time, become very popular, and it is unfortunate that the Paris catastrophe, which was due to gross ignorance, has been followed by several minor accidents, through want of care. These have led the public to believe, unfortunately, that animated photography is a more or less dangerous exhibition. We are told that the exhibition of "animated photographs" at the Crystal Palace was stopped through the terms exacted by the insurance companies. The recent accident near Bradford, occurring just at the commencement of the lantern season, will not tend to reassure the general public that, with even ordinary care, there is no more danger than with any other entertainment.

Argentaurum.—This, as our readers may remember, is the new substance so like gold that the United States Mint buy it, and pay for it, as gold, but which is alleged to be made from pure silver. A syndicate appears to have been formed to work it, and at present is engaged in issuing large and costly advertisements, offering prizes of 100*l.* in value for the best essays written on certain lines which bear on the theory of argentaurum production. Four prizes are offered, the first being for "the best compilation of statements published by men of science of the present century respecting the unity of matter and the theoretical possibility of producing gold from so-called elements." Another is for the best account of erroneous doctrines taught in scientific text-books, &c. The whole tendency of these prize-givings is foreshadowed in the closing words of the advertisement: "Faraday was a Luther, he dared to openly pronounce himself as follows: 'To decompose the metals, then to reform them, to change them from one to another, and to realise the once absurd notion of transmutation, are the problems now given to the chemist for solution.'"

Röntgen-ray Work.—As dull weather and dark days approach, we find prominence being given to X-ray work. The Röntgen Society will hold its opening meeting on November 5, at St. Martin's Town Hall, W.C., when it is arranged that Professor Sylvanus Thompson will deliver an address. There will be an exhibition of Röntgen apparatus, photographs, and methods.

Dr. W. J. Collins writes that there is some caution necessary in making use of the newly acquired means of diagnosis. Referring to a recent case, he says: "This case again leads me to the conclusion that, while gratefully acknowleding the valuable additions to our methods of investigation which Professor Röntgen's discoveries have placed in our hands, it is a mistake to suppose that, even in the limited region to which the new method is applicable, it has reduced surgical diagnosis to the mere contemplation of pictorial effects."

Then, again, in the *Lancet* we have an interesting article from Drs. J. Mackenzie Davidson and W. S. Hedley, describing a method they have devised of getting rid of probable errors in diagnosing the position of a foreign body. They point out how the shadows, when photographed, give no correct indication of the size, form, or relative position. They have worked out a method of cross wires and duplicate or triplicate exposures from slightly different standpoints of the tube, and then, by means of weighted needles and pieces of silk thread, so localising the exact position of an object that, in an experiment they made with a pellet embedded in a mass of hard paraffin, they were enabled in the first incision of a needle to exactly reach the pellet.

The National Portrait Gallery.—The fortieth annual eport of the Trustees of the National Portrait Gallery was issued ne day last week. It appears from it that there are 1085 portraits xhibited, which consist of 933 pictures hanging on the walls, 123 orks of sculpture, and 29 miscellaneous portraits in cases. Already, ne report tells us, the Trustees meet with a difficulty in finding pace on the walls, and screens have had to be put up to take some f the pictures. The number of visitors to the Gallery has been, rom April 4, 1896, to April 3, 1897, considerably over a quarter of . million, the actual figures being 254,942; the highest number in ny one year while the Gallery was at South Kensington was but 46,178, and this was the year of the Fisheries Exhibition. These igures show the advantages of the more central and accessible ituation.

There are some new regulations in connexion with the Gallery hat relate to art students. For instance: "Parties from schools wishing to visit the Gallery for educational purposes can be admitted 'ree on students' days, on notice being given to the Secretary, stating the number of the party." Photographs are not allowed to be taken in the Gallery without permission having previously been obtained, and then only on students' days—Thursdays and Fridays. It is forbidden to take into the Gallery without permission any sort of photographic apparatus, and the curators and police have instructions to see that this regulation is strictly enforced. Some time back it will be remembered that there was an outcry from a small party because amateur photographers were not allowed to amuse themselves with the pictures in the National Gallery, and great things were threatened; but the idea quickly "fizzled" out, as might well have been surmised.

We have before now mentioned that a National Portrait Gallery can never be complete when it has to rely entirely upon paintings and sculptures, from the simple fact that many whose portraits should have a place in such a collection have never had a portrait of themselves made in those ways; or, it may be, if they have, their families will not part with them. Few there are, however, of modern times who have not been photographed, and photographic portraits would be forthcoming, and they could also be printed by one or other of the permanent processes, or they might be photo-engraved. In a National Portrait Gallery *portraits* and *likenesses* of the individuals should be one of the chief considerations, and not the methods by which they were produced. By all means let us have the finest paintings and sculptures if we can get them, but, if not, let us have the portraits, even if they be the humble photograph. They might have a place separate from the paintings, but, from the report just issued, it would seem there would be no room for them at present in Trafalgar-square, and, perhaps, no inclination to have them there if there were.

DIGRESSIONS.

No. XXIII.—The Teaching of the Exhibitions.

The lesson of the year has again been taught by the Salon. That lesson is, shortly, that coffee-and-milk colour, if not the worst, is one of the worst for a background on which photographs can be hung. To quote the admirably written "forewords" of the catalogue, "An endeavour has this year been made to show that the colour and character of the wall upon which the picture hangs are quite as important factors in its framing as the mount or moulding which immediately surrounds it." This is marvellously true, and is exquisitely shown in a curiously original and self-sacrificing manner by the walls of the Salon itself for an unexpected but most praiseworthy purpose.

The Salon was begun as a teacher, has continued as a teacher, and is a teacher still, a greater teacher this year than ever, and it is always original in its teaching methods. I don't think that the enormous influence it has had for good over not only the pictorial world of photography in general, but also the Royal Photographic Society of Great Britain in particular, is properly appreciated, but, so that its lessons strike home, it does not mind at what sacrifice, for sacrifice is the soul of art. In former years it has taught by success, tempered with a little eccentricity; this year it conveys its lesson by splendid failure tempered with catastrophe, and I hasten to warn our Pall Mall friends and most conscientious imitators against following any of this year's peculiarities, but to take them as they are intended, as friendly warnings.

The Salon, from the day it took its earliest breath, has been always in luck, and it can afford to teach. This year the combination of members and circumstances, added to the advent of a great genius in decoration, has conspired to produce a splendid failure, and an example for all exhibitors, especially the Royal Photographic Society of Great Britain, of what not to do.

Perhaps it may be as well to mention one or two points that should not be overlooked from the lesson to be derived from the unsuccessful point of view, and really I glow with satisfaction when I think of the eminently practical use to which I am putting the failures for the sake of an ungrateful world, which is too apt to smile at misfortunes and yet take advantage of them.

Everybody remembers the dilapidated old drapery on the walls of the Dudley Gallery. It was ragged and faded, but it was warm, and comfortable, and cosy; it showed up the photographs, and, if there were holes here and there, they were easily covered by pictures. This drapery, mellowed by age, and the original overgarish colour, faded and modified by light, is now covered up by new drapery. The upper part is of sackcloth, the lower part, on which the photographs are hung, mourns in coffee colour, if not in ashes. We are not without poetry. Perhaps we are stricken with the prevailing disease in art—hysteria. The upper and lower portions are divided by a nearly white shelf, supported on brackets, that runs round the room. Here we come to a charming bit of symbolism. On this shelf are placed crystal vases, holding bunches of the decorative plant, "honesty," showing that the intention was good, any way. It is very pleasant to find that a bit of modern decoration has a thought in it. However, I am told that it was not done intentionally, and I cannot help thinking it was suggesting too much to arrange the honesty so very irregularly. There is evidence, on the upper part, that a rapid stenciller had passed that way, and stopped occasionally to drop a pattern. There is no dado, once so popular, now out of fashion, but I am told by a very high authority that the floor and wall are to be taken as one in effect. The floor is one, and the wall is one, and the two are one, and, if we do not believe that one is two, and beautiful and indivisible, we are in danger of something very unpleasant. I hereby confess my individual belief to save consequences.

Now a word about the pictures. The system of hanging—for there must have been a system if we could only see it—is "not as plain as the old hill of Howth" to the uninitiated, but the ruthless distributor seems to have passed along dropping a frame here and there and filling in with anything that didn't fit, leaving, however, plenty and varied spaces between; these, again, are filled with bits of so-called ornaments, irritating little bits of ill-drawn patterns, which distract the eye, suggest the pavement artist, and give the photographs no chance. But the Salon must be cruel to be kind. The lesson must be taught, and the very latest idea in hanging a gallery seems to be to decorate a room rather than show the pictures to the best advantage. The result is that all the decent pictures look ashamed of themselves.

The lesson, however, has been given at a great sacrifice to the teachers. Is there one picture, except those we can scarcely call photographs, that has not suffered? It must be remembered that many of the pictures provided have been specially provided, in many cases at great cost and trouble, with no thought of profit, for this Exhibition, yet they have been sacrificed that others may be permanently taught the exact tone of colour that has the most deleterious effect on photographs. It has been my good fortune to see many of these photographs before they were sent in to this gallery. In most cases how blooming they looked! Yet how sick and sad they appear now. Again, I have never before experienced how flabby, uncombed, and ragged-edged an exhibition without a "line"

can look, or how low it was possible to hang pictures without calling forth indignant outcries from the unfortunate exhibitors. It was once suggested, I am told, as part of the scheme, that cushions should be supplied to enable enthusiastic amateurs to see some of the lowly gems comfortably.

The first general effect on entering the room is that of shock at the poverty-stricken effect of the gallery. You feel the apparent inexperience of the hangman, but you give him credit for trying to do his best with an insufficient supply of pictures; yet I have heard the supply was better and larger than usual, large as it has always been. There is ample room for at least another hundred pictures, and they would have been a great advantage to the general effect. The visitor gets no leading suggestion, the bays, once so admired and eagerly imitated by the Royal Photographic Society of Great Britain, are abolished; there are no "centres," except the one that holds up the woman with a cigarette to be worshipped as the acme of photographic art and taste.

That the distributor has not much cared what pictures were hung, or in what places, is amply shown by the character of the occupant of what was once known as the place of honour at the end of the gallery. In former times, visitors, desirous of finding what was probably the most interesting picture of the year, paid their earliest attention to this spot. What do they find there now? It is occupied by what is entitled an *Idea for a Poster*, one of the vulgar and detestable French posters, which the thoughtless have substituted for the late lamented æsthetic lily, and worship as art. Taking this poster in connexion with some of the nakeds (wrongly called nudes), a member who cares for pictorial photography and decency may well quote that choice bit from Ezekiel, "Thou hast defiled my sanctuary with all thy detestable things." This picture is by a true artist, whose works I have admired, more than any done abroad, for their technique; but his frivolous subject in this case is absolutely unworthy of occupying so prominent a position. It is desperately clever and very difficult, but you cannot help feeling sorry it was possible at all. A representation of a "lady" in a public-house, smoking a cigarette, and "having a drink" is not a decent Englishman's idea of the proper occupant of the place of honour in one of his national exhibitions. Trivial ideas should be left to trivial men. M. Demachy's genius is worthy of serious art; but, good as some of his other pictures may be, I see nothing to justify the enormously larger number exhibited of them than of any single English photographer, or that they should be grouped together, while others are squandered. Indeed, foreign photography is vastly overdone this year, and the garish and gaudy-coloured prints by a mongrel process in another part of the room are neither "fish, flesh, fowl, nor good red herring," and only act as incongruous and ruinous "notes" among the more modest but more genuine monochromes.

Nobody could welcome more joyously than myself a few of the best foreign pictures, but the Salon is certainly not the place for every little experiment done abroad, nor is the Salon the place in which to exploit a process, however promising. The annual proportion of exhibits from all countries outside Great Britain has rapidly increased, until, out of a total exhibit this year of 231, there are 89 from beyond seas, many of them attempting to rival in eccentricity Mr. Nicholson's *Cricketer* of two or three years ago, which was found *not* to be hung upside down, after all. This was a well-appreciated joke, only very poorly followed now by his foreign imitators.

It is possible that the style of decoration may suit many of the light and frivolous foreign photographs, but was the game worth the candle? Perhaps some of these curious photographs were not really intended as foreign "comic relief." If they are, I regret that I can see nothing better among them than a melancholy failure to be humorous, to which the gum-bichromate process, it must be confessed, seems eminently fitted.

The Pall Mall Exhibition also teaches a useful lesson. The lesson is that, by assiduity, attention to, and careful imitation of, the best model, which the Salon has been up to this year (showing blind faith that may do mischief if not stopped), a really interesting Exhibition may be got together, even if the best pictures are not to be secured.

The Exhibition of the Royal Photographic Society is this year one of which the Salon should be very proud. It contains nothing great, but nearly every picture is good. In fact, the "usual thing," as so admirably pointed out by the *Times*, is levelling up, and the hanging, modelled on former shows of the Salon, is well done. The Society often deplores the raggedness of its walls, and tries to hide the tears and stains with pictures and brown paper, but the self-sacrificing Salon this year teaches that a dilapidated wall of good colour is better than a new one that ruins the photographs.

Just one word in conclusion. I don't object to a little eccentricity, we owe much progress to it; but, if we must go so far as to let it entirely supersede true art, let us embody it in our own individuality. We need not go abroad for second-hand new impulses, otherwise we shall have to be content with worn-out French *chic* (or is it cheek?). Progress, if you like, but let it be in the right direction. It is possible to become too eccentric. We seem to be drifting in the direction of habitual offenders, and are beginning to find ourselves wallowing in the slough of Whistlerian muddle.

H. P. Robinson.

P.S.—The educational intention of the decoration of the Salon will be still clearer to those who visit the Eastman Photographic Exhibition, opened since the Salon, and decorated by the same clever artist this time to demonstrate what *should* be done. In the arrangement of the rooms, to suit the needs of various kinds of photographs, Mr George Walton has shown himself the great artist he really is in adapting decoration to purpose. In one gallery he has treated serious pictorial photography most successfully, and in another he has made Pocket Kodak photography look (and, I have no doubt, feel) comfortably at home in one of the greatest temples dedicated to painting and sculpture.

COLLODION BACKING FOR PLATES.

Of late there has been considerable discussion on the subject of backing plates, which, I am glad to see, is gradually becoming an acknowledged advantage for all kinds of work. That it should have been slighted by professionals for so many years is rather difficult to understand. Of course, with those who only take a few negatives occasionally, the trouble of backing plates overcomes the somewhat supposed doubtful advantages of doing it; but, as the plate-makers, year after year, improve the rapidity of their emulsions, I am inclined to think, with increased tendency to halation, so the necessity for backing will become more and more evident. If all plates were issued with a *good* backing, one that is *easily* removable and innocuous in the developer, it would, no doubt, help to the production of more perfect negative work. Until this happens it only remains for the user to back his own plates. There are two methods, both of which seem to meet the requirements of the case, and, when one is found too difficult of application, the other can be substituted. The neatest method is, I think, the collodion method, although I have seen that several correspondents complain of the trouble and waste of time, with the possible damage to the film in addition, by bits of backing getting on to the surface and sticking there unnoticed until too late, giving rise to oratorical display, emphatic if not parliamentary.

The late Mr. W. Bedford used collodion backing, home-made, as a vehicle for colouring matter to prevent halation and blurring, that was free from all the faults that have been so liberally bestowed on it. I can say, from considerable experience with it, that it was all that a backing should be, after it was once satisfactorily applied.

Coating the back of the plate without getting any on the face was the crux, and necessitated one or two precautions. The collodion must not be too thin; it should be of a creamy, easily flowing description, compounded with more spirit than ether, and the pyroxyline should be powdery, of the kind usually termed high-temperature cotton; about five or six grains to the ounce of spirit is sufficient; both the ether and spirit may be the methylated kind. When the cotton is dissolved, add sufficient aurine to make it a good deep orange colour. The aurine, if powdered small, is easily soluble.

The plates themselves should possess smooth edges. Now, this is one of the most troublesome things about it; if the edges of the glass are rough, the chances are the backing will take a short cut across the face of the plate, to its utter destruction, and its removal at this stage is quite out of the question. In coating it is best not to go *quite* to the edges with it, and pour it off at the corner in the usual way, then set up on edge to dry. Backing made in this manner does not stick to the plate, or

k up into inconvenient little bits to cause trouble, but directly it is ed, at any rate in a few minutes, can be most easily rubbed off with finger. For my own part, I had used to put the negative into the and develop without taking any notice of the backing, which com- icated its colour to the solution, and so made the plate more safe the action of light during development; a wash under the tap after- ls, with the least friction, cleaned it all off—collodion, colour, every- g. I can only suggest, if the sample of cotton or collodion should be adherent, a little wax solution rubbed over the glass, prior to coating, ld probably remedy the fault of sticking, but with the backing I e just described nothing of the kind was at all required, it almost oved itself under the tap, and I feel sure any one trying it would like r its anti-halation qualities and neat appearance, for, save and except care required in coating, it is unexceptionally good.

'he alternative method of backing is with a mixture of burnt sienna, amel, gum arabic, and diluted methylated spirit. A small quantity of n. is required, just sufficient to keep it from being powdery and sing dust specks on the surface of the plate with shaking about in dark slide. It can be applied in two ways: if thin, it can be shed over the glass with a flat hog's-hair tool; or, if thicker, a little ared on to a slab and used with a soft roller squeegee, like a printer s up his type. This is a very neat way of doing it and answers very ll, a much less quantity of backing being required to cover a definite a of surface. Like the collodion, it will not injure the developer, hough, being opaque and somewhat messy in comparison, I generally it off under the tap with a piece of rag before commencing develop- nt.

In the application, I rest the plate on its lower edges, holding it m with the left hand by pressing the fingers on the upper edge whilst e composition is applied with the right hand, in preference to laying the ate flat on its face on a piece of soft paper, and then applying the cking; however, it is of slight consequence, taking care not to finger e surface of the plate or lay the backing on too thickly. The less used e better, so long as the glass is covered. The room in which the plates e left to dry should be quite dark, or there is a chance of an unpleasant rprise by finding streaks and markings on the negative where the light s acted on it through the thin or bare parts that happen to be un- vered with backing, brush marks, in fact. It is always best to put ay the plates as soon as dry, which, if there is a fair amount of spirit the backing, will not be a very protracted period.

EDWARD DUNMORE.

THE TWO EXHIBITIONS VIEWED FROM A COMMERCIAL STANDPOINT.

THE OTHER SIDE OF THE QUESTION.

I HAVE read with great interest the article in these pages of October 15 nder the above heading, and I can quite appreciate that the sentiment of sappointment which you attribute to the provincial professional photo- apher visiting this year's Exhibitions is a true description of his first elings; but, acting on the old proverb that the looker-on sees most of e game, I venture to think that the impression made is not quite a true ne, and that, probably unconsciously, a certain amount of prejudice is troduced into his judgment.

The average professional photographer, working in his studio day by ay, produces a certain average stereotyped result, which is demanded the average customer, and, just as we all fail to realise that there is ny other world outside our own—that bordered by our own vision—so e unconsciously comes to the conclusion that his is the only true photo- raphy—not that his personal work is the best, but rather that the finest orker in his individual style is the finest of all photographic workers; nd, coming up to London for his annual trip to the Exhibitions, and, eing no such superior work of his own school, is naturally disappointed. e asks the question, "Would the general public purchase work of ne same character of so many that are shown at Pall Mall and at iccadilly?"

Now, in the ordinary way, I am quite content to accept the opinion and erdict of the general public, so long as it has seen both sides of the uestion, and has a fair opportunity of judging; but I suggest that the eneral public of to-day is not in this position. During the last fifteen r twenty years the professional photographer has gradually built up his leal of what a photograph should be, and, almost without exception, he as forced this on the market until the average outsider has gradually een persuaded to accept it as the only production possible. He has reated a special universe of his own, solely independent of nature or eason, in which the laws of lighting are at variance with that of our own, in which those of anatomy are equally opposite, and he has decreed that, if you venture within the boundary of this world, you must immediately be moulded in its general pattern. And, as an instance of a similar pliability of the general public, I suggest the similar acts of a well-known caricaturist, Harry Furniss, who, only a few years ago, transmogrified many characters of the political world in the same way. Lord Randolph Churchill was represented as a short, little bulldog fellow, with a perky nose and aggressively curled moustache, whereas the man man in real life had none of these characteristics; Mr. Gladstone was always, *in the sketches*, hidden behind enormous limp collars, which completely enveloped his venerable head, until finally the public came to believe that these characteristics were true, and were very much disappointed and annoyed, just as the provincial professional is, that the men themselves were comparatively ordinary individuals in appearance and didn't play up to their parts.

If one studies the earlier photographic portrait work—and I have that of Rejlander in my mind—one finds none of the marked characteristics of the present commercial article; the brilliant surfaces were absent; the fearful and wonderful strained lighting was never attempted; ladies' waists failed to excite anatomical curiosity; the lines of the face were rather welcomed as aids in delineation, than retouched out with the fateful pencil; there was no stereotyped pose or mode of treatment.

Now, to my mind, the great merit of the professional work at the two Exhibitions, in past years, has been that it has been produced without the limitations of this *unnatural* public taste, according to the individual taste of the men who, in the eyes of the provincial professional, are his leaders, and who, if it is demanded, can produce his ideal work. Let him, therefore, consider this fact, and I am sure he will appreciate that there must be something worth studying in the pictures which they send in as specimens of what they—these leaders in the professional—consider as approaching their ideal; and if we take the opinion of one of them—as I did yesterday—he will probably tell us that, as the public get further opportunities of seeing various styles of treatment, they are glad to exercise their choice, and that it does not always incline towards what I may call "the good old usual," and that those who choose outside it are not the least wanting in cultivation or taste—that the appreciation of Mr. Harold Baker's *Lily Hanbury* and *Andante dolcemente*, for instance, portraits is not confined to the producer only.

And, with regard to landscape work, this conclusion seems to me even more marked. If we wander to Whitby, we shall see some of Mr. Frank Sutcliffe's well-known carbon prints, probably all of which have been exhibited at the Royal or Salon, and we shall find that there is a continuous demand for these at about five times the price of the stock view and that, as they depend only to a very minute extent on their topographical interest, there must be something beyond—I suggest it is the general artistic treatment, and the individuality of the producer which prompts the appreciation and opens the purse.

Only the other day I was visiting, and had the monthly portfolio of my Correspondence Club sent on; the majority of the members are well-known professional and amateur workers, the intentions of the Club are avowedly pictorial, and the work certainly not stereotyped. One of my fellow visitors—a man of distinct taste in, at least, other matters, and a connoisseur of beautiful things—was surprised and delighted with the prints (pictures he called them), and he asked me if I could obtain him replicas of some of them. I pointed out to him that the price would probably be ten times as much as he would give for a stereotyped "good old usual" of the same size, but he was quite content, as "his appreciation and pleasure in seeing them was far more than ten times."

And, if we take the results at the end of the Exhibitions, what do we find? That many of the pictures are sold, and some of them more than once over, and that these are, in the majority of instances, when the producer has not limited himself to the usual thing. Probably no one will suggest that Mr. Horsley Hinton's landscapes are within this category, and yet, I believe, many copies of *Day's Decline* were bought at the Salon of two years ago, and the price was certainly larger than the commercial one.

Recently there was an Exhibition in the town in which I was staying, and I sent in some prints, one of which won the prize. It was, I think, extreme in its mode of treatment, but that did not deter the buyer, and since then the local picture dealer has had two inquiries for further copies.

But the idealist may say, "You are always measuring appreciation by £ *s. d.*" Well, in the instances I have given, I am surely cutting my suit according to my cloth, for it is monetary appreciation which the "provincial professional" wants, and, as far as I am concerned, I am content to consider it very expressive.

I am not suggesting by these or any other instances that the professional photographer should be an extremist—rather that he should not be one—either for glazed P.O.P. or rough-mounted carbon; but what I should like to see, and what I prophesy the public would appreciate, would be that advantage be taken, in the production of the commercial photograph, of the variations and powers of the different processes of photography, and that the professional photographer should exercise these rather than build up artificial limitations of his own. This is the lesson, I suggest the two Exhibitions should teach to the provincial professional photographer, and, if he take note of them without prejudice and in an open-minded way, I believe his trip to London will not be a disappointing one, and that, if he does not forget the lesson so taught, he will find that it has brought him advantages, the not least important being monetary ones. Endowed, as he generally is, with a complete knowledge of his craft, and freed from the Frankenstein of conventionality, which he has built up, and which now threatens to destroy him, both a monetary and artistic reward is well within his reach, and his average good taste, and that of the general public, will prevent any excesses, either in diffusion of focus or anything else.

W. J. Warren.

PHOTO-CERAMICS.

The members of the Leeds Camera Club evidently expected a treat at their weekly meeting on Wednesday evening, the 13th inst., for they turned up in large numbers to witness Mr. Elliff, one of their members, give a most practical lecture and demonstration on the subject of "Photo-Ceramics." The table in front of the lecturer was most plentifully bedecked with beautiful examples of the lecturer's work.

Mr. Elliff regretted that photo-ceramics was so little worked by the amateur photographer, for the process was very simple and fascinating. The materials and chemicals are very few, thus making the process easy to understand and work. Any one with a lot of patience and a little perseverance should be able to do some good work, and if he should make a failure or two—well, all that is lost is a little chemical, and sometimes a bit of temper. One of the greatest difficulties formerly was in knowing where to obtain the necessary materials, but they can can now all be purchased from one firm, thus ensuring greater success than would be obtained if one had to go to a dozen houses for the materials. When we remember that this was one of the earliest photographic processes, the wonder is that photo-ceramics is not more popular with the public. Decoratively, it is capable of universal application, such as on lids of boxes and jewel cases, put on opal, and framed for pictures, and for decorating china, tea services, and every kind of crockery. Her Majesty has many beautiful specimens on her bracelets, &c., and the Princess of Wales has decorated her table ware by this process with pictures from her own negatives. In considering the means by which a vitrified photograph may be made, we are confronted with a condition which forbids the use of the ordinary photographic printing. The image must be formed on some non-combustible material, which will not perish by the great heat to which it is subjected in the furnace. In fact, it must be formed of such matter that at the time of fusion nothing else is present save that which forms the image. This is obtained by what is known as the powder process, which is dependent on the fact that a film of certain gummy compounds, in conjunction with a bichromate salt, loses its power of absorbing moisture according to the degree it is acted upon by light. The parts most acted upon lose their affinity for moisture, while the parts least acted upon retain their great propensity for moisture to the presence of which it is extremely sensible. From a negative (which should be crisp and full of detail) a transparency is made, and it is from this the image is taken. Now, having got the transparency, the sensitising solution is next prepared. This is really two solutions, one of which is known as the sensitiser, and the other as the organifier. These are mixed in equal proportions just before use. The formula is as follows:—

No. 1. The Organifier.

Le Page's fish glue	1 ounce.
Glucose	4 ounces.
Water to	10 ,,

No. 2. The Sensitiser.

Ammonium bichromate, or potassium	1 ounce.
Water to	10 ounces.

This is the only chemical formula required. The lecturer strongly recommended this preparation, not because it was cheap, but because it is undoubtedly the best; it flows evenly, it is easily made, keeps any length of time, and so is always ready for use when required. In the mixed state it is not advisable to use it after it has stood four days. Mr. Elliff demonstrated the process by actually working a picture before his audience. After lighting a cheap folding spirit lamp, he cleaned a piece of glass of a rather larger size than the desired picture, proceeded to heat it by holding it over the spirit lamp, keeping up a circular motion, so that the heat would be gradual and thus avoid breaking the glass, heating it until it could just be borne on the back of the hand. In the course of his remarks during the demonstration, he said: The mixed solutions, after being filtered, are then taken and made to flow evenly over the glass support in somewhat the same way as varnishing a negative, and continuing to hold over the lamp it soon dries, and is ready for exposing behind the transparency, which is put into a printing frame in the usual way, and exposed before a piece of magnesium ribbon about one foot long, or five minutes' daylight. By the aid of a camel's-hair brush, known as a mop, you proceed to apply the ceramic powder and the parts of the bichromatised film which are protected from the action of light, still having its affinity for moisture, will at once begin to absorb the dust from the powder, and the image will gradually appear. The dust should be brushed upon the film until the image is the very least darker than what is required in the finished picture. The film is next coated with Mawson's enamel collodion, mixed in equal quantity with methylated sulphuric ether. This very soon dries. The picture is then trimmed to the desired size, when it is placed in a dish of clean cold water, and allowed to remain until the film leaves its support and floats on the surface of the water. This also washes it free of all extraneous matter, but in order to make sure that it is properly washed, carefully bring the support in contact with the film again, lift it out and drain, and place it into another dish of clean cold water. The depth of this dish should be such that, when the film floats off its support, you can get underneath the film with the article on which it is finally to rest, and bring it out of the water again. It is then thoroughly drained of water, and held over the spirit lamp and gradually dried. Be very careful to avoid blisters or bubbles caused by the evaporation of the moisture. The article is now ready for the kiln, in which it is placed, and subjected to a great heat. In order to give some idea of the required heat, supposing its final support be a piece of opal, you bring it to such a heat that the glass is nearly soft, but not hot enough to melt and run. A furnace or kiln suitable for amateur work may be made out of a piece of stout sheet iron, twelve inches by eight inches. Bend this over narrow way of the iron into the shape of an oval tube, making the flange secure by means of three or four rivets. Now cut another piece of iron of an oval shape, of a size suitable to form a bottom, or rather an end, for the tube, which is held in its place by a rivet or two. The kiln is now complete, and, to use it, insert the closed end between the two bottom bars of the kitchen fire until the masonry at the back is reached. A good fire is then made up, and in a short time our impromptu furnace will be at a very red heat. Another piece of iron (which should be much stouter than the iron forming the furnace), eight inches by four inches, will form a plate on which the ceramic opal is placed and inserted in the furnace. After the ceramic powder has fluxed by the great heat of the furnace, the opal is withdrawn and placed in the oven, or some warm place, to anneal. The picture is then finished and ready for adorning the article for which it is intended, or it may be mounted and put into a suitable frame.

SOME REMARKS UPON DEVELOPMENT.

[Paper read before the North Middlesex Photographic Society.]

I do not think that any excuse is needed in the selection of my subject to-night. However fully the subject of development may have been treated, and however freely discussed, it may be taken as the iteration of a truism, that a knowledge of the practice of development is the fundamental essential to a successful practice of photography.

At the first glance it may seem impossible to touch upon the subject of development without trenching upon controversial ground; but that I shall avoid. Whatever other advantages it may have, photography has this one, viz., that its rules in the dicta of its scientific exponents may be observed or disregarded, it doesn't matter, the picture's the thing. "Respice finem" is the pictorial photographer's motto. As a matter of fact, in photography there are no rules, no accepted rules, or, at least, very few, and the difference between a successful and an unsuccessful photographer is not seldom the difference of temperament in a careful, perhaps a rule-of-thumb, worker and—a less careful one. Still, if there be no generally accepted rules, every worker is entitled to have his own notions, and to make the best he can of them, and some of mine I propose to put before you to-night.

I have spoken of the practice of development as the fundamental essential of the successful practice of photography. I think that is a true statement. Regarded from a business point of view, I would have the would-be photographic aspirant thoroughly grounded in the practice of development before I allowed him to make any other photographic operation of any sort or kind. I have found that lads who have had two years' training in the developing room quickly master all the difficulties of exposure and management of the camera. They have learnt what defects to avoid, and, more important still, they have learnt the relative value of time in exposure. No table, no exposure meter, no actinograph yet constructed, can compare with the instinct which teaches a man the difference in value between one light and another, between one class of subject and another. The average tyro, nay, the average worker, never masters these difficulties, these admitted difficulties of

time of exposure, perhaps because, in practising photography, he is working with two unknown factors, exposure and development. Men who are adepts at the latter find the variations in the former a sufficient tax upon their judgment.

Let me make a suggestion, then. The North Middlesex Society possesses some excellent workers, and holds annually, and within a few weeks from now, an excellent pictorial Exhibition. Might not the Society find the encouragement of the teaching or practising of development amongst its less advanced workers not only an advantage to some of its present members, but an excellent "draw" to young photographers in the district who may desire to become members.

But this by the way, and only because, in a general sense, photographers, both amateur and professional, get very little training that may be called training, and not because I suggest that any of your members are not most proficient in development.

I have spoken of a two years' training in development. This is for an intelligent lad working with the intention of adopting photography as a trade or business. The period is not too long, but an enthusiast with good educational training would acquire the principles of development in less time. Nothing but practice, however, will enable any one to successfully cope with irregular or incorrect exposure, or even the best treatment of normal exposure. In the full sense of the words, of course the effects of incorrect exposure can only be partially compensated for. Only the correct exposure gives the best result. Let me put it another way. The exposure which makes the best result is the correct exposure, and no other, however careful, however skilful the treatment in development, is so good. But it may be good enough; some are easily satisfied. With that I have no concern. I am stating a notion of mine, as I said I should, and that is that there is one exposure—all others are compromises. Sometimes one deliberately selects a compromise exposure, but for reasons indicated by the pictorial effect required. These modifications are easily acquired by practice and by instinct when development is learned as a first step to photography. The effects of over-exposure are observed, the amount of under-exposure gauged and decided by the photographer who learns development first, and bases his subsequent exposures upon the judgment previously acquired.

It must not be assumed from these remarks that I am stating that a photographer has no power, no control in development. On the contrary, he has enormous powers. The Hurter & Driffield position that the exposure finds the opacty ratios is only, I think, asserted by them when development is carried to its completion and light action practically exhausted by development. This hardly ever obtains in practical work. When it does happen, the result is a negative which looks better than it prints. As a matter of opinion, it is insufficiently exposed according to rule of thumb. It is a safe notion to put forward, therefore, and I put it forward, that nearly all exposures are compromises—compromises on the full side—and that the best sensitive material is that one which permits the widest margin of compromise (Hurter & Driffield period of correct exposure) in exposure with control in development.

What is control in development? Not so much, I think, the compensation for errors in exposure as the time regulation of the order in which the tones appear and strengthen, and the possibility of completely restraining or partially restraining the deepest shadows at will. Some sensitive preparations are more amenable to this control than are others. When the practice of photography is commenced by learning development, the value of the essential potentiality of effective control is quickly appreciated, and a plate which can't be controlled is regarded as impracticable. No material which veils under the action of normal development is of any use unless the exact exposure is hit upon, and this I have stated, seldom happens, most exposures being compromises. It is one of my notions, then, that a plate, or other sensitive material, should be selected with a view to its amenableness to control in development, and disregard of this has often, in my case, spelt failure. Obviously, the higher the sensitiveness the less the possible effective control, probably the most effective argument against the general and unnecessary use of very highly sensitive emulsions.

Having given you my notion of what control in development consists in, let me go a step further, and inquire how this control is best effected. It is not, as before stated, so much a control over large errors in exposure as a regulation of the order in which the image appears, and the depth to which the reduction is carried. No doubt, we have all heard tales or statements of the marvels which can be effected in development. I specially remember one gentleman who, at a London Society of which I am a member, enlarged upon what he could do, and finally stated that, given a series of similar exposures made with all the differing sizes of stops in a lens, he could produce a number of negatives which should be alike and indistinguishable. I envy that man not only his knowledge of photography, but his other powers. Practically, my notion is that an error of double exposure can hardly be controlled to get a result comparable with that which a correct exposure would have given. The resulting negative might possibly yield a print worthy to be placed upon the line of our premier exhibition; that does not affect the facts. There is no necessity to label one's pictures, "Effect obtained by accidental over-exposure." To return to the method of control. This largely depends upon whether the character of the exposure—that is to say, whether it is correct, over, or under—is known for certain. With under-exposure a weak developer and patience is the best resource. With known over-exposure a plentiful use of bromide before development is generally effectual, and this must be followed by an energetic developer very highly restrained, which will, with suitably selected sensitive material, permit the shadows to develop at the expense of, and well before the details appear. With normally exposed plates, by ringing the changes between the use of restrained strong solutions to increase contrast, and diluted and unrestrained solutions to produce details, all useful control can be effected. The point to remember is that the use of these modifications enables development to be stopped at a desirable and satisfactory moment; but that, if development be continued to its finality with any developer, then the Hurter & Driffield theory comes into operation, and the result is over-exposure.

S. Herbert Fry.

THE EASTMAN EXHIBITION.

One of the most remarkable photographic Exhibitions yet held was opened to the public at the New Gallery, Regent-street, W., on Wednesday last, October 27. It will remain open until November 16. There is no charge for admission, tickets or visiting cards sufficing to pass one into the Exhibition. The entire suite of rooms of the New Gallery has been taken by the promoters of the Exhibition, which may roughly be divided into four sections—competitive, pictorial, technical, and apparatus. Thus there is both variety and interest in the display, which possesses all the attractiveness that can possibly be imparted to a photographic Exhibition.

For the Eastman Photographic Exhibition is no mere trade display of the contents of a shop window. In what we may term the Art Section, placed in the chief gallery, the visitor has before him a number of works by the principal pictorial photographers of the day, constituting in itself as good, beautiful, and interesting a collection of photographs as could well be brought together. This feature alone amply suffices to render the Eastman Exhibition notable. Moreover, in this gallery and in that devoted to the competition prints, Mr. George Walton, the art decorator, has apparently been given *carte blanche*, with the happiest of results. The special hangings of the former gallery are in purple Congress cloth, with white draperies stencilled with the word "Kodak" as a bordering design, and the frames have been specially designed to harmonise with the colour scheme and ornament of the room. The competition gallery is hung with white linen, with stencil ornaments, and the photographs are placed upon screens or panels, having backboards covered with Dutch blue fabrics. Both galleries have a most refined appearance, and the plan of placing the thousands of small prints in separate large panels was a decidedly good idea of Mr. Walton's.

The Judges were Messrs. G. A. Storey, A.R.A., A. Pringle, and H. P. Robinson, and the following are their awards:—

Class A.—Contact Prints. Snap-shots.

(*Any size above Pocket Kodak.*)

Prize No.	Name.	Cat. No.		£	s.	d.
1	Owen, E. B.	1064	Cash	31	10	0
2	Bingham, Mrs. A. Y.	168	,,	21	0	0
3	Calland, E.	841A	,,	10	10	0
4	Janes, Geo. J.	567	,,	5	5	0
5	North, E. R.	33	,,	5	5	0
6	Hitchcock, D. H.	66	,,	5	5	0
7	Wiggins, Miss M. A.	700	,,	5	5	0
8	Brion, Madame, A.	911	No. 4 Cartg. Kodak	5	5	0
9	Doran, R. E.	1052	,, ,, ,,	5	5	0
10	Juessen, E.	325	No. 4 Bullet	3	3	0
11	Trescott, Mrs. E. W.	129	,, ,,	3	3	0
12	Bougenan, E.	244	No. 4 Bull's-Eye	2	10	0
13	Brien, E. F.	268	,, ,,	2	10	0
14	Bouffet	293	,, ,,	2	10	0
15	Dawes, H. B.	401	No. 2 Bullet	2	2	0
16	Buchler, M. W.	441	,, ,,	2	2	0
17	Roberts, Ll.	505	,, ,,	2	2	0
18	Behmer, F.	621	No. 2 Bull's-Eye	1	13	0
19	Carrier, F. A.	801	,, ,,	1	13	0
20	Spiriti, Dr. Joseph	590	,, ,,	1	13	0
21	Gaskell, Miss	829	Pocket Kodak	1	1	0
22	Peile, F. M.	528	,, ,,	1	1	0
23	Fuzier, Paul	1027	,, ,,	1	1	0
24	Keppel, Lady Mary	223	,, ,,	1	1	0
25	Jennings, W. N.	520	,, ,,	1	1	0

Class B.—Contact Prints. Time Exposures.

(*Any size above Pocket Kodak.*)

Prize No.	Name.	Cat. No.		£	s.	d.
1	Calland, E.	1236A	Cash	31	10	0
2	Martin, J. S.	1168	,,	21	0	0
3	Vallean, G. E.	1234	,,	10	10	0
4	Steadman, F. M.	1236	,,	5	5	0

Class B.—(*Continued.*)

Prize No.	Name	Cat. No.		£	s.	d.
5	Miner, W. H.	1216	,, ...	5	5	0
6	Welford, Mrs. Jeanie ...	1209	,, ...	5	5	0
7	Welford, Walter D.	1174	,, ...	5	5	0
8	Smithard, Frank C. ...	1147	No. 4 Cartg. Kodak	5	5	0
9	Ellsworth, Miss C.	1148	,, ,, ,,	5	5	0
10	Toy, H. W.	1149	No. 4 Bullet ...	3	3	0
11	Moulthorp, G. E.	1172	,, ,, ...	3	3	0
12	Blair, Alex.	1186	No. 4 Bull's-Eye ...	2	10	0
13	Cadby, Will A	1197	,, ,, ...	2	10	0
14	Dawson, W. E.	1213	,, ,, ...	2	10	0
15	Dumont, John E.	1236B	No. 2 Bullet ...	2	2	0
16	Baldry, W. F.	1169	,, ,, ...	2	2	0
17	Aston, W. Smedley	1232	,, ,, ...	2	2	0
18	Pope, Miss	1235	No. 2 Bull's-Eye ...	1	13	0
19	Ramsden, Miss R.	1230	,, ,, ...	1	13	0
20	Longest, W. B.	1182	,, ,, ...	1	13	0
21	Abrams, W. L.	1151	Pocket Kodak ...	1	1	0
22	Dawes, H. A.	1133	,, ,, ...	1	1	0
23	Cripps, Ham D.	1187	,, ,, ...	1	1	0
24	Lee, Frank	1157	,, ,, ...	1	1	0
25	Darrah, H. J.	1166	,, ,, ...	1	1	0

Class C,—Enlargements, any Process.

(10 × 12 *inches or larger.*)

Prize No.	Name.	Cat. No.		£	s.	d.
1	Barraclough, Fred.	2462	Cash	31	10	0
2	Proessdorf, R.	2479	,, ...	21	0	0
3	Burgess, P.	2471	,, ...	10	10	0
4		2455	,, ...	5	5	0
5	Grindrod, Dr.	2469	,, ...	5	5	0
6	Spiriti, Dr.	2464	,, ...	5	5	0
7	Battersea, Lord	2481	,, ...	5	5	0
8	Dresser, Dick	2450	No. 4 Cartg. Kodak	5	5	0
9	McClure, Lady	2501	,, ,, ,,	5	5	0
10	Hankinson, C. J.	2499	No. 4 Bullet ...	3	3	0
11	Blair, Alex.	2463	,, ,, ..	3	3	0
12	Howard, Cecil	2467	No. 4 Bull's-Eye ...	2	10	0
13	Chapman, Master	2487	,, ,, ...	2	10	0
14	McKeckine, G. W.	2477	,, ,, ...	2	10	0
15	Gaskell, Miss	2512	No. 2 Bullet ...	2	2	0
16	Thield, Ewald	2449	,, ,, ...	2	2	0
17	Beavis, Dr. C.	2468	,, ,, ...	2	2	0
18	Molyneux, Lady G.	2476	No 2 Bull's-Eye ...	1	13	0
19	Calland, E.	2483	,, ,, ...	1	13	0
20	Newton, W. M.	2456	,, ,, ...	1	13	0
21	Gack, Réné	2494	Pocket Kodak ...	1	1	0
22	Dresser, A. R.	2448	,, ,, ...	1	1	0
23	Davis, Dr. T.	2472	,, ,, ...	1	1	0
24	Baldry, W. F.	2475	,, ,, ...	1	1	0
25	Pugos, R.	2484	,, ,, ...	1	1	0

Class D.—Lantern Slides.

(*Any Subject.*)

The Prize Lantern Slides are shown in the Technical Room in a covered tunnel specially built for convenient inspection of the transparencies.

Prize No.	Name.	Cat. No.		£	s.	d.
1	Lysaght, Major	521	Cash	21	0	0
2	Déxlée, René...	55	,, ...	15	15	0
3	Breux, Hy.	399	,, ...	10	10	0
4	Tyler, J. E.	74	,, ...	5	5	0
5	Greerson, Dr.	103	,, ...	5	5	0
6	Darbishire, B. V.	186	No. 4 Cartg. Kodak	5	5	0
7	Spencer, G. F.	28	,, ,, ,,	5	5	0
8	Bowers, A. S.	425	No. 4 Bullet ...	3	3	0
9	Roberts, L.	112	,, ,, ...	3	3	0
10	Howe, A. W.	451	,, ,, ...	3	3	0
11	Warnerke, Miss	282	No. 4 Bull's-eye ...	2	10	0
12	Bennett, —	387	,, ,, ...	2	10	0
13	Welford, W. D.	231	,, ,, ...	2	10	0
14	Robinson, M. R.	12	No. 2 Bullet ...	2	2	0
15	Barnes, Rev. H.	221	,, ,, ...	2	2	0
16	Descamps, E.	263	,, ,, ...	2	2	0
17	Dawson, W. E.	201	No. 2 Bull's-eye ...	1	13	0
18	Harrison, W. H.	238	Film or Bromide Paper to value of	1	10	0
19	Gibbs, S.	250	,, ,, ,,	1	10	0
20	Turner, E. P.	440	,, ,, ,,	0	15	0
21	Hertzog, Rudolph	509	,, ,, ,,	1	10	0
22	Wilms, Geo. L.	469	,, ,, ,,	0	15	0
23	Newton, W. M.	273	,, ,, ,,	0	15	0
24	Gray, Ed. P.	477	,, ,, ,,	0	15	0
25	Mayes, G.	34	,, ,, ,,	0	15	0

Class E.—Pocket Kodak Prints.

(*Any Subject.*)

Prize No.	Name.	Cat. No.		£	s.	d.
1	March, O.	1767	No. 5 Folding Kodak, &c....	21	0	0
2	Stoiber, A. H.	2193	No. 4 Foldg. Kodak	12	12	0
3	Teed, Miss Isabella L. ...	1285	No. 4 Cartg. Kodak	5	5	0
4	Gumpert, L. D.	1749	No. 4 Bullet ...	3	3	0
5	Corrilhon, G.	1341	,, ,, ...	3	3	0
6	Millar, Miss E.	1305	No. 4 Bull's-eye ...	2	10	0
7	Drinkwater, W. R.	1404	,, ,, ...	2	10	0
8	Bowers, A. S.	2176	No. 2 Bullet ...	2	2	0
9	Fischer, O. E.	1282	,, ,, ...	2	2	0
10	Wise, J. J.	1309	No. 2 Bull's-eye ...	1	13	0
11	Taylor, Miss M.	1437	,, ,, ...	1	13	0
12	Young, Miss A.	2293	Pocket Kodak ...	1	1	0
13	Warburg, Miss A. B. ...	2112	,, ,, ...	1	1	0
14	Delage, H.	1932	,, ,, ...	1	1	0
15	Cadby, Mrs.	1964	,, ,, ...	1	1	0

Class F.—Pocket Kodak Enlargements.

(4¼ × 6½ *inches or larger. Any Subject.*)

Prize No.	Name.	Cat. No.		£	s.	d.
1	Stoiber, A. H.	2520	No. 4 Folding Kodak, &c....	21	0	0
2	Motterman, W. C.	2532	No. 4 Foldg. Kodak	12	12	0
3	Cluzeau, Bernard	2560	No. 4 Cartg. Kodak	5	5	0
4	Rosenheim, O.	2588	No. 4 Bullet ...	3	3	0
5	Kuchlé, Mdlle. Marie ...	2536	,, ,, ...	3	3	0
6	De Pulligny	2589	No. 4 Bull's-eye ...	2	10	0
7	Rhoades, W. E.	2517	,, ,, ...	2	10	0
8	Roberts, John T.	2533	No. 2 Bullet ...	2	2	0
9	Barton, G. A.	2575	,, ,, ...	2	2	0
10	Spiriti, Dr. J.	2541	Film or Bromide Paper to value of	1	10	0
11	Dunn, H. E.	2519	,, ,, ,,	1	10	0
12	Baldry, W. F.	2587	,, ,, ,,	1	10	0
13	Warnerke, Miss	2586	,, ,, ,,	0	15	0
14	Marshall, Mrs. L.	2573	,, ,, ,,	0	15	0
15	Knox, Horner H. G. ...	2580	,, ,, ,,	0	15	0

The enormous number of pictures shown obviously precludes a detailed reference, and we are therefore obliged to confine ourselves to a summary of the principal features of the Exhibition. The Central Gallery, which is immediately gained from the entrance-hall, is devoted to the display of apparatus for film photography, prominent among which is the folding pocket Kodak, a new introduction of the Company. This gives a picture 3¼ × 2¼ inches, and is easily carried in an ordinary pocket. It measures when closed 1⅝ inch thick, and, being flat like a book, takes up not much more room than some cigar cases. The movements appear simple and certain, the front easily springing out into position or closing up. Other features of the section are Bullet and Bull's-eye Kodaks, Folding Kodaks, Kodets, &c.

In the "Invitation" room, already referred to, are hung nearly 200 enlargements by the Eastman Company from negatives lent by such workers as Andrew Pringle, B. Alfieri, W. Thomas, Karl Greger, F. M. Sutcliffe, J. Craig Annan, E. R. Ashton, George Davison, Paul Martin, Mr. and Mrs. Cadby, Lord Maitland, H. P. Robinson, Major Lysaght, A. R. Dresser, C. Job, E. Calland, Miss F. B. Johnston, F. H. Evans, Thomas Manly, Charles Moss, A. Horsley Hinton, and others. Additional interest is imparted to this gallery by the presence on one of the walls of about thirty enlargements from negatives taken by the Royal Princesses, mainly portraying, so to speak, episodes in the home life of these exalted ladies and their near relatives. Taken altogether, the Invitation Section is a very fine pictorial display, the chaste decorations, the novelty and taste of the framing, and the surprising excellence of the photographs, reflecting infinite credit on all concerned.

The technical exhibits deserve to be studied by the photographer anxious to improve his acquaintance with the technique of his profession. The examples of colour obtained upon Solio and bromide paper by the use of different toning baths are highly instructive; of the former, prints toned in the best-known gold and platinum baths are shown. The varieties of surface to be obtained on Solio paper by squeegeeing and burnishing constitute an instructive exhibit. Solio prints by development, and some most artistic and pleasing portrait heads on Solio emulsion, coated upon transparent film, and backed with various fabrics, show the visitor what a wonderful variety of effect and colour is obtainable in gelatine printing.

The Royal bromide paper, with a toned rough surface and a very rich colour, is made a special feature in the technical gallery, and many of the prints and enlargements there are on this new surface. The toning of bromide prints also receives practical attention; indeed, the Exhibition is worth a visit simply to see what command is obtainable over the qualitative and colorific properties of contact prints.

Transferotype paper, cinematographic negatives and positives, paper negatives and prints therefrom, and examples illustrative of the phenome-

of correct under-and-over exposure add to the educational interest of this section, in which lantern slides on films, radiographs on X-ray paper, and many examples of photographs on sensitised silk, linen, &c., also figure.

All concerned in the Exhibition are to be congratulated on the display now on view in the New Gallery. It admirably illustrates the enterprise and resource of the Eastman Company, and inclines us to think that photography generally will be the gainer by the impetus such an Exhibition as this, held in the centre of fashionable London, must surely give to the "black art."

THE CINEMATOGRAPH ACCIDENT AT BRADFORD.

I HAVE not seen in the photographic journals or any of the London daily papers any other explanation of the cause of the panic at the Cinematograph Exhibition at Baildon, near Bradford, beyond what was termed an explosion of gas in the lantern, and a large flame setting fire to the draperies.

As one interested in lantern matters, I was anxious to know how it occurred, what light was used, and some explanation of the large flame. The first thoughts were naturally "something wrong with the ether saturator," but, when one paper said that a little more gas was turned on in the lantern to make the views more distinct, with the result that the flame shot up and caught fire to the drapery, I felt it might have been due to some *contretemps* with the ordinary limelight, and, as the whole thing was in so much doubt, I sent for a local paper (the *Bradford Citizen Weekly*), from which the following is extracted.

"One of the *Leeds Daily News* representatives on Monday interviewed Mr. Walter Bentley, who was manipulating the cinematograph. He said that the ninth picture gave a representation of the switchback in operation at Shipley Glen, and when the picture had got half way through it stuck. Before Mr. Bentley could do anything towards easing the obstruction, the concentration of the rays from the lamp, acting like the focussed rays of the sun, caused the film to ignite. It immediately dropped down into the bag containing the other films and set them alight. These films are composed of celluloid and are very inflammable. As soon as the burning films dropped into the bag the others went off like gun-cotton. There was a sudden puff of light, and then, for a couple of seconds, there was a fierce rush of flames reaching almost to the top of the chapel. The two operators immediately seized the bag and subdued the blaze without very great difficulty, the flames being as short-lived as they were fierce.

"With regard to the statement that Messrs. Bentley and Rigg had their arms and hands severely burned, Mr. Bentley declared that the story was absolutely untrue. Neither of the operators was injured in the least, and, as Mr. Bentley remarked, 'we hadn't a single hair singed off.' Mr. Bentley denied that there was any explosion of gas, or that they were interfering with the gas at the time of the accident. Some few moments previously he had turned on a little more 'lime,' and that was what probably gave rise to the belief that something had gone wrong with the gas.

"The sole cause of the accident was the fusion of a portion of the film brought about through its being exposed to the light too long owing to the film sticking.

"Messrs. Bentley and Rigg had the greater part of their films destroyed, and their loss will amount to about 50*l*."

N.B.—For the non-technical expression of a little more "lime," lanternists will naturally read "gas."—G. R. B.

The above places the matter very clearly, and one can only suppose that no water or alum bath was employed to stop the heat rays. If so, it shows the absolute necessity of interposing one between the light and the film, also that each of the latter should fall into separate receptacles, and have a lid to keep it safe, for the flare of celluloid is almost an instantaneous flash, and the damage in cases like this most serious to the owner besides the more vital matter—risk of loss of life.

G. R. BAKER.

Our Editorial Table.

LYONESSE: A HANDBOOK TO THE ISLES OF SCILLY.

By J. C. TONKIN and B. P. ROW. London: Beechings Limited, 174, Strand, W.C.

SIR WALTER BESANT contributes an introductory chapter to this little book which is fully illustrated by maps and half-tone reproductions of negatives by Mr. Row and others. Issued under the auspices of the Homeland Association for the Promotion and Encouragement of Travel in Great Britain and Ireland, the book avowedly directs attention to the beauties of a little-known corner of England, and contains articles on the sea angling and flower farms. It is an exhaustive and, at the same time, appreciative guide, and should lure many a tourist to these charming isles.

THE PRIMUS LANTERNIST'S POCKET-BOOK.

Edited by W. F. BUTCHER, F.C.S. Bradford and London: Percy Lund & Co.

IN addition to spaces for recording engagements, amount of gas used, lists of slides, &c., this useful little pocket-book, which is sent free to lanternists on application, gives several reference tables that are calculated to be of considerable assistance to those interested in optical projection, including sizes of discs obtainable, distances between lantern and screen, means for ascertaining the quantity of gas in cylinders, and other serviceable information.

MEASURES OF LENGTH, AREA, BULK, WEIGHT, &c.

By WORDSWORTH DONISTHORPE. London: Spottiswoode & Co., New-street-square.

OUR readers are aware that Lord Crawford, President of the Royal Photographic Society, has recently directed the attention of photographers to the need of reform and codification in the systems of weights and measures in use in this country, so that Mr. Donisthorpe's painstaking and exhaustive volume reaches us at an appropriate moment. The author's objects are to show the defects of the existing English arrangement, and of the French (metric) system, and to propose a complete system, embodying all the merits of the metric method without any of its drawbacks. In the chapters devoted to the historical section of his subject, Mr. Donisthorpe describes in wonderful fulness and detail the various systems of weights and measures that have been in vogue from the most remote times. The nature of the reform he advocates may be gleaned from the following extract from the table he gives showing the values of the new measures of weights in terms of the old:—

Une	·00056438 drachm.		
Gramme	·56438	„	
Yasp	2 lb. 3 oz. 4 3830	„	
Ton	19 cwt. 76 „ 9 „ 15·04	„	nearly old ton.
Poid ..	984 ton 4 „ 13 „ 4 „ 5	„	

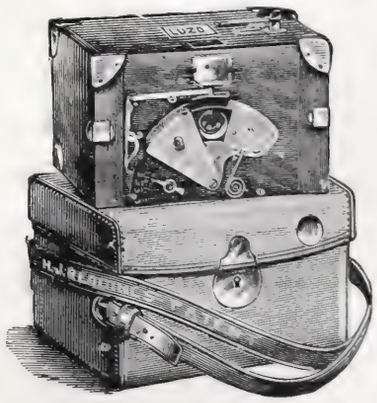
It is apparently an improvement on the French system that he advocates. The book is a scholarly and valuable contribution to the literature of a vexatious subject that urgently calls for legislative settlement, though we are less hopeful than Mr. Donisthorpe that Government will do anything like what is required of it in the matter.

THE LUZO HAND CAMERA.

Redding & Gyles, 3, Argyll-place, Regent-street, W.

MR. H. J. REDDING, who, for about a quarter of a century, was associated with the firm of Messrs. J. Robinson & Sons, of London and Dublin, has recently allied himself in business with Mr. Gyles, and the firm's premises are well situated in Argyll-place, Regent-street. Here, in addition to the usual photographic dealing business, the development of customers' negatives, printing, &c., are undertaken. Mr. Redding will be remembered as the inventor of the extremely ingenious and portable dark-room lamp bearing his name, and many other useful ideas have emanated from him. Among these may be enumerated the Luzo hand camera, which forms the subject of the present notice.

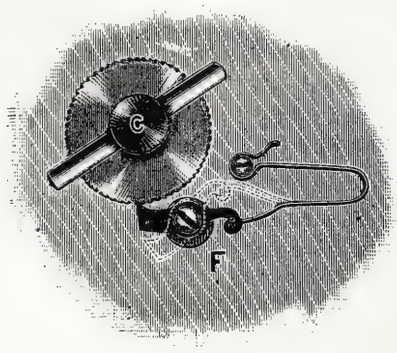
The actual dimensions of the Luzo hand camera are $5 \times 6\frac{5}{8} \times 4\frac{1}{4}$. The body is made of Spanish mahogany, and, as a specimen of photographic cabinet work, is one of the most excellently constructed and



finished that we have seen. It is fitted with a rectilinear lens of very good defining power, and the finder, of biconcave form, gives an image of remarkable brilliancy. The shutter, which is on the sector principle, admits of a variation of the exposure from time to instantaneous.

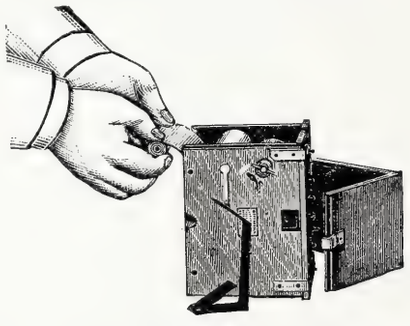
Fig. 1 shows the camera on its case, in which it may be placed for actual use, as the case is holed opposite the exposing and changing mechanism. The Luzo takes rollable celluloid film, and, after an exposure has been made, it is necessary to wind off the exposed film

by turning the handle, C (fig. 2), on the top of the camera, slowly to the right, at the same time watching the spring indicator, which will gradually rise and return with a click; the instant the click is

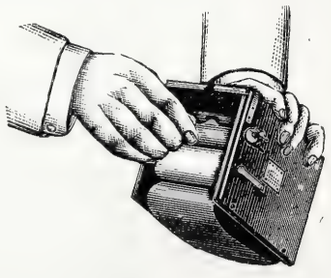


heard, one has to stop winding and press the button at the back of the camera, which marks the spaces between the exposures. By this means each exposed film is accurately measured off.

Fig. 3 shows how a portion of the exposed film may be rolled off



in the dark room, and fig 4 indicates the method of attaching the end of the film to a metal cylinder in the camera, preparatory to winding up ready for exposure. The Luzo takes a spool of film for



forty-eight exposures, the number of which is registered as they are made.

The Luzo is extremely simple in use. It demands only three operations for instantaneous work, which are thus summarised:—

1st.—Set the shutter.

2nd.—Hold the camera steady; see that the object appears in the finder, and press the trigger.

3rd.—Wind off the exposed film, and press the button which is at the back of the camera.

It is a well-thought-out, beautifully made, and practicable little instrument, which deserves to be popular.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, November 3, at eight o'clock. Annual General Meeting: Election of Officers, &c.

THE business of the Northern Photographic Works, Limited (manufacturers of animated photographic apparatus, films, and appliances), hitherto carried on at 45, Salisbury-road, Barnet, has been removed to more commodious premises situate in Nesbitt's-alley, High-street, Barnet, where all communications should be addressed to the Company.

BRIXTON AND CLAPHAM CAMERA CLUB.—The Club's Seventh Annual Exhibition will be held, November 1 to 6, at the Clarence Rooms, Brixton. In addition to a strong invitation class, members' classes, and apparatus section, there will be every evening lantern entertainments, animated photographs, demonstrations of X rays, kromskops, &c. The Judges are F. P. Cembrano, Esq., Lieut.-Colonel J. Gale, and E. J. Wall, Esq.

THE period of festivals is apparently approaching, for we have received a notification that the Second Annual Dinner of the South London Photographic Society will be held on Saturday, February 5, 1898, at the Montpelier Hotel, Choumert-road, Peckham. The Ninth Annual Exhibition of the Society will be held at the Public Baths, Church-street, Camberwell, S.E., and will open on Saturday, March 5, 1898, and close on the following Saturday night.

AMATEUR PHOTOGRAPHIC SOCIETY OF AMSTERDAM.—In commemoration of the Tenth Anniversary of the foundation of this Society, an International Jubilee Lantern-slide Competition is to be held. Exhibits will be received up to February 1, 1898, and there are classes for professionals and amateurs. Besides lantern slides, cinematograph films and photo-micrographs are eligible for competition. Full particulars and entry forms may be obtained of the Secretary of the Society, Handboogstraet 2, Amsterdam.

TRANSPARENT BROMIDE PAPER.—Mr. Arthur Schwarz, of Berlin, has taken out a patent for the use of transparent paper as a support for gelatino-bromide of silver. He says: "Hitherto only opaque paper, prepared with bromide of silver, has been, and now is, employed in the production of photographic pictures. In carrying my invention into practice I use transparent paper, prepared with bromide of silver as aforesaid, in the production of such pictures, and my invention consists in using transparent paper, prepared as hereinbefore mentioned, for photographic works and purposes generally."

ACCORDING to an American paper, two professors—one in Italy, the other in America—propose to obliterate the line of demarcation between the organic world and diamonds: "They have made photo-micrographs, which views show the crystal in its birth, the head showing forth from the mother crystal, and the course is followed as it pushes out and away. The crystal meets another one from a different mother. The two strike at each other, they fight, strive, and clasp with each other. It is a case of the survival of the fittest. One must die. No two crystals from the same mother ever fight, however, no matter where they meet."

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.—The Third Annual Exhibition of this Society is announced to take place on December 28, 29, 30, 31, 1897, and January 1, 1898, at the Borough Polytechnic Institute. As last year, there are two open classes, viz.: (*a*) Prints (direct or enlarged) and (*b*) lantern slides (sets of four); not medalled previous to December 11, 1897, at any open exhibition. One silver and one bronze medal are offered in each class. An addition this year takes the form of an "Invitation Class," by which the Committee hope to secure the loan of some of the recent productions of leading workers of the day. The Judges are Lieut.-Colonel J. Gale, John A. Hodges, Esq, F.R.P.S., and E. J. Wall, Esq., F.R.P.S. Entry forms are now ready, and can be obtained of the Hon. Secretary, Mr. F. W. Bannister, 103 Borough Road, S.E.

THE NATIONAL PHOTOGRAPHIC AND ALLIED TRADES' EXHIBITION, 1898.—We are informed that this Exhibition, which is to be held in the Portman-rooms, London, W., from April 22 to April 30, 1898, bids fair to be most successful. The available positions are being quickly taken up, and it is anticipated that it will not be long before every foot of space has been booked. Spaces are being allotted strictly in accordance with priority of application. Messrs. Johnson & Sons, Limited, of Cross-street, Finsbury, who made such an attractive display at the recent Chemists' Exhibition, have booked their space at the Portman Rooms, and may be relied upon to show something of special interest, whilst two other prominent firms have decided to show apparatus in course of actual manufacture.

ALLEGED FRAUDS.—At the Bedford Petty Sessions on Wednesday, the 20th inst., Edward Aubert and Charles Anstis were charged with stealing 3*s.* 6*d.*, the property of Herbert Arnold, at Wootton, on September 23. It appeared that the defendants were strangers to the town, but they went about the neighbourhood, with two separate billheads, describing them as landscape and general photographers. They went to gentlemen's houses photographing them, and then taking the servants, and obtaining money from them for the photographs. On September 23 they went to Wootton House, and there received various orders, the photographs to be delivered within ten days. On October 3 the men left Bedford without leaving any address. Complaints were afterwards received by the police, and they arrested the prisoners with commendable smartness. Some photographs were then hurriedly sent to the people who complained. Evidence was then given by a gardener named Arnold, who said he ordered some photographs, which were to be delivered within ten days, but, after waiting fourteen days, he gave information to the police. Subsequently he received a package by post, on which he had to pay sixpence, as it only bore a halfpenny stamp. It did not contain the photographs he had ordered. Witness, on being cross-examined, said he did not know that the state of the weather would materially affect the production of the photographs. On the back of one of the photographs were the words: "The view of Wootton House does not come out well; will take it again soon and make it right" Ellen Robinson, a servant at Wootton House, gave similar evidence. After other servants employed in the district had given evidence, Mrs. Chandler, of 86, Cauldwell-street, said that Anstis and his wife took two rooms in her house at the beginning of September as weekly lodgers. Neither of the rooms was used as a photographer's shop or studio, and it was not correct to say that the business of landscape and general photographers was carried on at her house. Anstis left on October 3, and did not say where he was going. Mrs. Todd said that Aubert and his wife took two rooms at her house. They used to do finishing work in the bedroom, but used no part of the house as a general and landscape photographer's shop. They left on October 3, and gave instructions for letters to be sent to Post Office, Cambridge. Aubert would go out taking photographs, and his wife would stay at home and do the printing. Mr. Langley, who appeared for the defendants, submitted that it had not been shown that the defendants had been guilty of obtaining money by means of false pretences, but the Bench ruled otherwise. Mr. Langley said the principal point in the evidence of the prosecution was the fact that the prisoners were strangers to the town. When they left Bedford they sent off many photographs, and the cases

ientioned were only solitary examples. The goods were packed up and sent ff before the warrant was issued, and the reason for the delay was that Mrs. ubert, who did all the printing, was attacked with peritonitis, and consequently was unable to attend to the work. He submitted that there was o evidence against the defendants, and that the case ought to be dismissed. Medical evidence was called to show that Mrs. Aubert was suffering from eritonitis and unable to do any kind of work for some days. Eventually he Bench committed the prisoners for trial at the next Quarter Sessions ail being allowed, each defendant in 10*l.*, and each to find two sureties in 0*l.*, or one in 20*l.*

MANUFACTURE OF ALBUMEN IN CHINA.—An enterprising German firm has ndertaken the manufacture of albumen at Chinkiang, it having been found hat this place offered the best field for the business on account of the cheapess and plentiful supply of eggs. The factory is now successfully established, with possibilities of conducting it on a much larger scale. The country urrounding Chinkiang has always been noted for the rearing of fowls and ucks, and much attention is given by the farmers to this industry. The United States Consul at Chinkiang says that it is not an unusual thing for a farmer to have 4000 or 5000 ducks under his care. In China the duck is a fine, hardy bird, a prolific layer, and requires little attention and less expense. The eggs are preserved, and will keep for ten and twenty years. The process of preserving, says the *Journal of the Society of Arts*, is as follows: A lye of bean stalk and lime is made by burning these to powder. This is put in water, black tea leaves and salt in certain proportions being added. The boiling is continued until all the water has evaporated, and the residue becomes caked and hard. This is pounded, and the fresh eggs are placed therein, one by one, with a little rice husk. These remain in the preparation 100 days, when they are ready for use. The establishment of the albumen factory referred to above has made a good market for the eggs, and the country people bring them in by thousands. The factory uses ducks' eggs in the manufacture of albumen in preference to chickens' eggs, solely on account of their greater cheapness. They are brought, not by the dozen, but by the thousand, the factory paying an average of eight Mexican dollars per thousand. The process of the manufacture of albumen is by no means new, but is stated not to have been hitherto a financial success, owing to inability to utilise the yoke as well as the white of the egg. The difficulty has now been successfully overcome. As soon as the eggs are received at the factory, they are tested by a very simple but ingenious process. They are held in pairs in front of a circular opening in a tin cylinder open at the top, containing a lamp giving a powerful light, which is concentrated on the openings. Each speck and flaw in the egg is distinctly seen in this process, and all eggs showing the slightest sign of defect are at once rejected. The percentage of rejected eggs is remarkably small, rarely amounting to 50 per 1000. The good eggs are sent to the rooms prepared to receive them, where a number of Chinese girls are employed to break them and to separate the yoke from the white, placing each into separate vessels. The white then undergoes one or two processes—it is either carefully cleaned of all stray clots of yoke, and then put through a course of stirring in a large vessel, by means of a heavy rod or paddle worked by hand, when it is ready for the drying room; or, after being cleaned, it is run into large vats and allowed to ferment, the process of fermentation being accelerated by the admixture of certain chemicals, which chemicals are held by the firm as a secret. When it is found, in drawing off, that all impurities have either been deposited or thrown off in the form of a thick froth and the resulting liquid is albumen, as clear as water, the albumen is ready for the final process of drying. This is performed in a series of three rooms, each hotter than the last, the temperature ranging from 40° to 50° Centigrade. The albumen is run into shallow tin pans, about one foot square, which are placed in ranges of shelves in the drying rooms. Frequent examinations are made to see that the temperature is maintained, and that the process of drying is sufficiently gradual, uniform, and complete, a period of sixty to seventy hours being found necessary for that purpose. When thoroughly dry, the albumen, which now presents the appearance of isinglass, with a yellow tinge, is, after cooling, placed in large square packing boxes, lined with tin, holding about 400 pounds each, and is ready for shipment. The principal use of albumen is in the preparation of fast dyes for superior kinds of cotton goods, and it is shipped to England, Germany, and France. The yoke of the eggs, after separation from the white, is passed through two sieves—one coarse and one fine—and it is then run off into vessels holding about twenty pounds each, in the form of a yellow, even-running liquid of the consistency of rich cream. It is then poured into vats holding about 100 pounds, and a ten per cent. solution of salt, borax, and an unrevealed chemical is then added for the purpose of preservation. The mixture is thoroughly stirred until it assumes the consistency of thick molasses and of a dark orange colour, and is then poured, or, rather, forced, through a funnel into a cask holding about 500 pounds. This is used in the preparation and dressing of superior leather goods, and is in great demand in England, Germany, and France.

FORTHCOMING EXHIBITIONS.

1897.

October 29–Nov..... Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 29–Nov. 13 . Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
November 1–6..... Brixton and Clapham Camera Club. C. F. Archer, 1, Gauden-road, Clapham, S.W.
November 16–18 ..... Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.
,, 22–27 ..... Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.
,, 29, 30 ..... Durham City Camera Club. R. Hauxwell, The Avenue, Durham.
December 9–11 ..... Aintree Photographic Society.
,, 28–Jan. 1 . Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough-road, S.E.

1898.

January 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
January-February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30 ..... National Photographic and Allied Trades Exhibition. A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14..... International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
1–6.....	Brixton and Clapham	Seventh Annual Exhibition.
1.....	Bradford Photo. Society	*Experiences of a Travelling Photographer.* P. R Salmon.
1.....	North Middlesex	Informal Meeting.
1.....	Richmond	Lantern Evening: Members' Slides.
1.....	South London	Prize Slides.
2.....	Aintree	Humorous and Holiday Views.
2.....	Gospel Oak	Discussion on Plates and Sputters.
2.....	Hackney	Members' Lantern Night.
3.....	Borough Polytechnic	*Carbon Printing.* C. Sawyer.
3.....	Coventry and Midland	*Printing and Development of Bromide Paper.* Harold Baker.
3.....	Croydon Camera Club	Council Meeting.
3.....	Kingston-on-Thames	Annual Dinner.—Annual General Meeting and Election of Officers.
3	Leeds Camera Club.....	*1000 Miles with Cycle and Camera in Wharfedale.* George Thistlewaite.
3.....	Leytonstone	*Light and Colour, with Experiments.* A. P. Wire.
3.....	Photographic Club	Annual General Meeting.
3.....	Polytechnic	Visit to the Pall Mall Exhibition.
3.....	Southport	Practical Working of Platinotype.
4.....	Bolton Mutual Photo. Society .	*Photographic Enlargements.* Councillor G. H. B. Wheeler.
4	Leeds Photo. Society	*The Story of a Buried City.* H. Crowther, F.R.M.S.
4.....	Leigh	*Lantern-slide Making* Mr. Coulthurst.
4.....	Liverpool Amateur	*Picture-frame Making.* Dr. Llewellyn Morgan.
4.....	London and Provincial	A Paper by T. E. H. Bullen.
4.....	Manchester Amateur	*Cloud Negatives: How to Develop and Use.* T. Morley Brook
4	Woodford	*Notes on the Photographing of Flowers.* H. T. Malby.
5.....	Borough Polytechnic	*Platinotype Work.* F. W. Bannister.
5.....	Croydon Microscopical	*On the Development of Multiple-coated Plates.* J. H. Baldock, F.C.S.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 26,—Technical Meeting,—Mr. Andrew Pringle, F.R.M.S., in the chair.

PHOTO-MICROGRAPHY FROM 2 TO 2000 DIAMETERS.

Dr. EDMUND J. SPITTA, L.R.C.P., M.R.C.S., in lecturing upon this subject, treated first of the apparatus required for low-power work, from two diameters to thirty diameters, for which microscopical lenses and microscopes were of no use whatever, and it was necessary to have recourse to the camera. Ordinary photographic lenses could only be used to a limited extent, in consequence of their length of focus, and he was using with most satisfactory results a lens specially made for him by Messrs. Dallmeyer, and had also made a few pictures with a new objective by Zeiss, which were subsequently shown upon the screen. In order that the field of view should be equally illuminated, a large condenser must be employed, and the light must be centered with the greatest care even for low-power work. Specimens were shown of what was described as a very difficult branch of low-power work, that of photographing at one to two diameters the culture tubes used by bacteriologists. With regard to the higher powers, magnifications above ten diameters and up to 2300 diameters—the highest to which the lecturer had gone—were obtained by the use of apparatus of a different form, diagrams being exhibited and explained relating to the instruments of Messrs. Ross, Zeiss, Bausch & Lomb, Watson, and others, and also that devised and used by the lecturer himself. A substage condenser was required, Nelson's "quasi-achromatic" being sufficient for low powers, while for higher magnifications an achromatic condenser must be used, or, for the very highest work, an apochromatic by Powell & Leland. The main object of the condenser was to bring the rays of the illuminant in such a position that the objective should be filled, and, if the condenser did not occupy the exact position, the cone of rays would be narrowed and would not fill the objective, and the resulting photograph would be altogether unsatisfactory, although it was sometimes necessary to narrow the cone of light in order to obtain improved contrast. The latter purpose, however, was better served by the use of colour screens, in the same manner that employment of a light filter rendered it possible to obtain the detail of fine white clouds against a blue sky, with a foreground of snowy mountains. The relative advantages of achromatics and apochromatics were discussed, the latter being considered the more satisfactory in most cases, especially as they

permitted the use of high eyepieces. Photographs were shown to illustrate the difference of the resulting picture when taken of the same magnification with an objective of low numerical aperture and high eyepiece, and a high-power objective of great numerical aperture with a low eyepiece, as were also a large number of examples of biological and histological objects, podura scales, bacilli, and diatoms with and without dark-ground illumination.

Dr. Spitta's lecture, which was of a most interesting and instructive character, covered such a very wide field that it is obviously impossible for us in this place to give more than the merest outline of the many points which were dealt with. It attracted an unusually large attendance, and the proceedings were prolonged considerably beyond the hour at which the Society's meetings ordinarily terminate.

In the discussion which followed the lecture, Dr. LINDSAY JOHNSON spoke in high terms of the manner in which the subject had been treated, and added some details of certain particulars in which his own practice differed from that of Dr. Spitta; he also showed a photograph which he thought was unique—that of a section of dynamite.

Dr. BOUSFIELD rather severely criticised some of the statements of the lecturer, but the CHAIRMAN expressed the opinion that not a few of the slides reached a very high degree of excellence, and, Dr. SPITTA having briefly replied and acknowledged a vote of thanks, the proceedings closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 21,—Mr. J. S. Teape in the chair.

Mr. PHILIP EVERITT referred to some researches made by Liesegang on the reactions of salts in gelatine, and showed three slides, which were subsequently projected on the screen to illustrate his remarks. They showed the action produced by silver nitrate dropped upon bichromated gelatine and allowed to spread, and that of red prussiate of potash and acetate of copper. The peculiar markings seemed to indicate that the decomposition went on rhythmically, and attention was drawn to a kind of zone where the two salts met, which exhibited no apparent colouring. The strange formations and colourings were very interesting, and attracted some attention. Liesegang was disposed to connect the action with the ripening process of emulsions.

Mr. P. R. SALMON showed a most natural accidental colour effect in the shape of a lantern slide of a figure subject which was thrown upon the screen. The slide was originally black and white, but, having consecutively reduced and intensified it with Howard Farmer's reducer and the mercury and ammonia intensifier respectively, he found it to have turned within a week, having gone wrong exactly in the right place, and imparted a very pleasing blue tint to all but the head, the face being appropriately of a soft flesh tint. It was now in a transition state, and was going off.

Putting on one side the effect, it was ascribed to imperfect washing after the reduction.

The HON. SECRETARY, in a few words, announced the death of Mr. F. W. Edwards, President of the South London Photographic Society, touching upon his extensive work in the direction of printing experiments and demonstrations, and the loss sustained by that Society and photographers in his death.

Mr. JAMES COLE, of Barnet, in addition to a number of landscape subjects, showed a slide of the front of King's College, Cambridge. This he remarked was taken on a half-plate in a half-plate camera, the lens being raised to the extreme top of the plate, thus working with practically only half of the circle of illumination of the lens.

Slides by Mr. Hill, Mr. Kellow, and others were shown. A series of Paris views by Lévy, of Paris, and some figure studies by Mr. Salmon were amongst the noteworthy. Mr. Freshwater exhibited a series on fruit culture, illustrating the processes of grafting and budding and methods of training in vogue; and Mr. Welford contributed some Convention views and a series of snow and flower studies by Mr. Fraser, of New York.

PHOTOGRAPHIC CLUB.

OCTOBER 20,—Mr. Frank Haes in the chair.

A visitor, Mr. P. R. Salmon, showed a lantern slide curiously affected by chemical action, in which the blue tint of the dress and flesh colour of the face, &c., gave the slide quite the appearance of being hand-coloured. "Photography in Natural Colours," said one member; "there's a fortune in it; get the company up."

Mr. Haes showed an old-pattern tripod, which extended above the usual height, and was, moreover, very strong and rigid.

The nomination of officers, notices of resolutions for the annual meeting, and a general discussion upon internal Club matters followed.

Borough Polytechnic Photographic Society.—October 13 and 20, Ordinary Meetings, Mr. A. Bedding presiding.—On the 13th, the Affiliation lecture, by Mr. John A. Hodges, F.R.P.S., on

LANTERN-SLIDE MAKING,

in the absence of that gentleman, was jointly read by Messrs. BANNISTER and FISHER. The lecture deals most comprehensibly with all matters essential for the production of a good slide, and is well illustrated by about thirty slides by the author. On the 20th, Mr. WILLIAM GAMBLE very ably demonstrated on

PROCESS WORK FOR AMATEURS,

explaining in a most simple and intelligible manner the whole *modus operandi* of producing half-tone engravings or blocks. By the aid of two very powerful incandescent gas burners, as the source of reflected light, an exposure was successfully made on a process plate in an ordinary camera, the only necessary addition to which being a screen of fine cross lines, forming minute squares of about 133 to the inch. This is placed immediately in front of the sensitive plate, and produces the desired effect of softening the middle or half-tones. This screen also makes it necessary to use a square stop in place of the round one. After exposure, the plate is developed and fixed in the usual way, and when dry is printed in close contact with a sheet of prepared zinc, sensitised with ammonium bichromate. As soon as sufficiently printed, the zinc plate is coated with a special kind of printing ink and afterwards washed, finally being etched out by immersion in nitric acid.

Croydon Camera Club.—

A CHAT ABOUT LENSES

was the main subject of the meeting on Wednesday, October 20. The lecture, which is one prepared by the Rev. F. C. Lambert, was illustrated by a number of slides, and was read by the PRESIDENT (Mr. Hector Maclean). It deals with various elementary optical matters specially applicable to photographic lenses, perhaps the points best brought out being the connexion between a prism and a lens, the latter being described as practically composed of an infinity of parts of various shaped prisms. The distinction between virtual and actual images was also well described. At the end of the lecture, Mr. ROGERS having complimented the President on his delivery of it, an animated discussion was initiated by Mr. RICHARDSON calling in question the accuracy of Diagram XVIII. His contentions received the support of Mr. A. E. ISAAC whilst Mr. WIGHTMAN was against him. Messrs. WRATTEN and HOLLAND also joined in the fray. Subsequently, a number of lantern slides were shown by Messrs. Pook, Richardson, Isaac, and Maclean. An example of the pegamoid screen was tested, and found to have an intensifying effect upon the slides, *i.e.* the lights became lighter and the extreme shadows apparently darker. Those having thin, rather than "plucky," slides would probably find the foregoing material, which consists of an opaque sheet faced with a metallic surface, of material advantage, as a relatively weak illumination will, nevertheless, yield bright, high light. A party of members, in charge of the Hon. Secretary (Mr. L. G. Kough), visited the Royal Photographic Society's Exhibition on Monday evening, and reported their impressions of the photography displayed. These opinions were favourable, with the exception of the lantern slides shown (Convention series), which were considered below the average. Mr. James Packham, F.R.P.S., has received the compliment of a special invitation from the Royal Photographic Society (Affiliation Committee) to deliver the lecture he is preparing for the Croydon Camera Club on *Gum-bichromate Printing* at the Affiliation Committee's opening lecture of this season, to be held at the Photographic Club.

North Middlesex Photographic Society.—October 18, Mr. Mattocks in the chair.—Mr. HENRY SMITH read a paper on

PLATINOTYPE.

The paper was one of the series of Instruction Evenings, mainly intended for beginners. The lecturer developed some prints, including some kindly supplied by the Platinotype Company. The result of the Outing Competition to the Surrey Commercial Docks resulted in Mr. Mattocks being placed first and Mr. Barton second.

OCTOBER 25, Mr. Beadle in the chair.—Mr. S. H. FRY, F.R.P.S., read a paper on

SOME REMARKS UPON DEVELOPMENT.

The lecturer was very emphatic on the point that development should be mastered before photography is taken up either as a hobby or business. The operations of exposing, &c., are easily mastered afterwards. In the discussion afterwards, Mr. MCINTOSH said he thought fog played a very useful part in development, results could be modified, and by judiciously fogging a plate that was inclined to be harsh it was much improved. Mr. FRY disagreed with the speaker on that point; he always tried to avoid fog, if possible, and would prefer to use ground glass, or stain the film, if he wanted to alter its printing value. Mr. MUMMERY said Mr. Fry had not mentioned the use of an actinometer as an aid in getting correct exposures. Mr. FRY said he rarely used one himself, but it was a help to those whose instinct did not enable them to judge correctly. In answer to a question by Mr. MARCHANT, the lecturer said pyro used with sulphite or metabisulphite to get a black image had no advantage over other developers which gave the same colour of image.

Richmond Camera Club.—October 18.—The subject was

HINTS ON LANTERN-SLIDE MAKING,

by the President of the Club, Mr. F. P. CEMBRANO, who has been described as a past master of that particular branch of the photographic art. Mr. CEMBRANO enumerated the various processes of slide-making, with their distinguishing characteristics, expressing his own preference for the collodio-bromide method. He described and illustrated his method of printing in clouds, and his *modus operandi* in the important, but often neglected, detail of mounting and binding the slide.

Bradford Photographic Society.—October 18.—Mr. Geo. Thistlethwaite read Mr. J. A. Hodges' lecture on

LANTERN SLIDES.

The paper, which is one of those loaned through the Affiliation, was particularly interesting, being illustrated by some truly magnificent slides, some of which were most artistic, while others showed the faults into which the slide-maker would be liable to fall, such as the using of too ornate and fanciful a mount and the toning of colours quite out of keeping with the subject in hand, as for instance, red snowscapes and the like, the toning of snowscapes to pink tints being an anachronism often committed by those who would not think but sought merely effect. There were also some very useful hints thrown out as to the reduction of over-printed and over-developed slides, &c., and many of the dodges were quite new to the hearers. A word of praise must be given to the manner in which Mr. Thistlethwaite carried out his part of the business, interlarding the lecture at fitting periods with descriptions of dodges which he in his large experience as a lanternist, had found of great service.

Wolverhampton Photographic Society.—A lecture on the

LAND OF BURNS,

illustrated by Lantern slides, was delivered before the Society on Friday evening, at the Blind Institute, by Mr. W. Meikle, of the Walsall Amateur

hotographic Society, and the lecture was enlivened with a musical selection r Miss Meikle and the Misses Ada and Edith Wigfield, Miss Meikle singing Ye Banks and Braes." Some members of the Wolverhampton Literary Club ere present by invitation, and a very enjoyable evening was spent. Extracts om "Tam-o'-Shanter's Ride" were given by the lecturer, and illustrated on ie screen, and the remainder of the lecture consisted of amusing anecdotes id descriptions of the views of the Burns country, Dumfries, the Brig o' oon, Larne, Newton Stewart, Dalry, and the lochs and glens, some of the en scenery and the sky effects being very fine. This was the Society's opening eeting of the season, and was well attended.

Glasgow and West of Scotland Amateur Photographic Association.—ctober 18.—Annual General Meeting, twenty-five new members elected. ffice-bearers for the new session were elected as follows:—*President:* Thomas teventon.—*Vice-President:* A. Cameron Todd.—*Council:* Arch. Watson, Dr. Villiams, J. S. Gardner, Geo. Chalmers, J. C. Oliver, G. S. Bryson.—*Hon. ibrarian:* N. G. Reid.—*Hon. Lanternist:* Andrew Brown.—*Hon. Treasurer:* Vm. J. B. Halley.—*Hon. Secretary:* Wm. Goodwin. In the course of his naugural address the President referred to the lessons to be drawn from the ecent International Exhibition, and urged members to get away from the mere roduction of local views, to endeavour to make pictures, and to try their trength by sending their work for competition. A selection of the lantern lides from the Exhibition were shown on the screen.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE METRIC SYSTEM.

To the EDITORS.

GENTLEMEN,—There are bu' few photographers or others, who have ompared the respective advantages of our own and the metric system, who do not give their verdict in favour of the metric. The question aturally arises: Why do we not adopt it? There are many men of middle and older age who have been accustomed to the old weights and measures all their lives, and are naturally averse to any change. And in a free country I do not see why they should be coerced into doing so; but, on the other hand, I claim the same freedom for those who, like myself, prefer the simple metric arrangement. I learned in my school days that there were 16 drachms in the ounce. Now that I am a long way past the half-way house, I am apt to forget that there are only eight in the case of liquids. Neither can I remember (perhaps I do not try) how many ounces make a gallon, &c. But there is no difficulty about counting, and the use of grammes and their liquid equivalent (practically), cubic centimetres, creates no confusion. I may probably be answered that no one wishes to prevent the use of metric standards, either by me or any one else. Granted that no one objects (actively), yet many take endless pains, and do not spare money, to clear the path, as far as practicable, for the British measures man, but leave the metric man to plough along in the mud.

Now, who are these indirect supporters of the British jumble miscalled a system?

First comes the photographic chemist. He sends out most elaborate price-lists in British weights and measures only, entirely ignoring the metric. I feel convinced that any respectable and businesslike chemist, making a specialty of metric weights and measures, would, in any large town, and possibly in the country, secure a satisfactory return. He would secure most beginners, who were without previous experience in weighing and measuring chemicals, and many others who had not become by lengthy experience saturated with British standards. I may mention, *en passant*, that I understand that the new British Pharmacopœia is to be both British and metric.

The next offenders are, saving your presence Mr. Editor, writers on photography. They, with one or two worthy exceptions, give their formulæ in accordance with the English plan only; instead of English and metric, or, what is the same thing, English and percentages (or proportions).

Lastly we come to the plate-makers, or those who prepare the directions for use for them. Here, again, we have the English weights and measures in use exclusively. Certainly most makers will, when asked, send a metric copy, but with the letterpress in French. Although my French is very shaky, I find it is easier to grapple with the French directions rather than face those in the English standards, which always involve reference to tables. It would not cost the plate-makers a single farthing to have their directions printed in metric as well as English standards, yet it is probable that any one of them would entirely repudiate the idea, that they were either directly or indirectly opposing the use of the simpler measures.

I have no desire to see any favouritism shown to metric men, but only that we should all be treated alike. If this were done, it would merely become a question of the survival of the fittest and the result would be a certainty.—I am, yours, &c. CHARLES LOUIS HEITT.

THE RETURN OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—I notice in your issue of October 22 that "Late 9 till 8" makes an appeal to me to bring to a head that old grievance of the non-return of specimens. I am not unmindful of the high opinion your correspondent has formed of my abilities, but must in justice point out that the remedy is not within my power, but rests with the "vast army of photographic assistants." I am only one of that army, though, even if I were its general, it is too unorganized to be brought into battle array. I have frequently mapped out the plan of campaign if this and other grievances are to be removed—a plan I believe to be sound, and one that has been proved by experience to effect its object. What remains is for every photographic assistant to make it a matter of duty to carry out his allotted part.

For the benefit of "9 till 8," and others in a similar plight, I will repeat that little can be done, except by trade combination. Any photographic assistant who becomes a member of the National Union of Shop Assistants is bound to bring an injustice like the non-return of specimens before the Branch Secretary; the case will be duly considered, and, if legal action is possible, it will be taken by the Union. Probably legal action to recover specimens is not available, for no such action appears to be on record. In this case the Union offers the further advantage of having agents in every part of the country, who would make personal application for lost specimens. This, I am sure, would, in every case, lead to their recovery, the work of packing and posting being the chief cause of the non-return of specimens.

A "black list" might help to check the abuse, though it is a somewhat cumbrous method, unless pursued by an organization, since the information is difficult to convey to those in need of it. A better plan, and without the spirit of intimidation which clings to the "black list," would be to record the names and addresses of persons willing to make personal application for specimens lost in the town where they reside.—I am, yours, &c., JOHN A. RANDALL.

October 23, 1897.

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

To the EDITORS.

GENTLEMEN,—Some two years ago the Affiliation Committee took what steps they could to ensure a uniform practice amongst affiliated societies in the matter of the payment of the expenses of lecturers. The course taken consisted of a strong recommendation to the Secretaries of the affiliated societies that they should on all occasions offer to pay the expenses incurred by the lecturer at the conclusion of the meeting or earlier.

The recommendation has not been without effect, but the Committee have learned that, in some cases—recently, at any rate—this course has not been pursued, and I have been directed to communicate with you and to ask you through your columns to draw attention to the matter.

The Committee also instructed me to say that they will feel obliged if any gentleman lecturing before an affiliated society and not having his expenses tendered to him will communicate the fact to them through me, as they are anxious to do all they can to put an end to a state of things which is undesirable both from the point of view of the societies concerned and of the lecturers themselves.—I am, yours, &c.,

R. CHILD BAYLEY, *Secretary.*

12, *Hanover-square, London, W., October* 23, 1897.

THE NEWCASTLE PHOTOGRAPHIC ASSOCIATION.

To the EDITORS.

GENTLEMEN,—Will you kindly permit me to announce through your columns that I have resigned the Secretaryship of the above Association, having accepted an appointment in London, and that the new Secretary will be Mr. W. Thompson, 22, Campbell-street, Newcastle-on-Tyne, to whom all communications should in future be addressed?—I am, yours, &c., J. BROWN.

Newcastle-on-Tyne and Northern Counties' Photographic Association, Newcastle-on-Tyne, October 21, 1897.

THE LATE F. W. EDWARDS.

To the EDITORS.

GENTLEMEN,—Adverting to your intimation last week of the death of our late President, Francis William Edwards, F.R.P.S., the following particulars may be of interest to your readers:—

He was born in the parish of Marylebone, and, being left an orphan at the age of six, he was brought up by his uncle. He was educated at St. Katherine's School, Regent's Park, and, on leaving there, he studied and practised photography with his brother-in-law in the Walworth-road. About 1868 they separated, each of them taking on a different

class of work. About this time his career as an architectural photographer may be said to have commenced. He first carried on business in the Albany-road, and later, for a very long period, at 87, Bellenden-road, Pecham, where he died, on the 16th inst. For about two years he was connected with the firm of W. H. Ward & Co., Limited, Shaftesbury-avenue, and, on leaving them about twelve months ago, he recommenced business, on his own account, in Newman-street, Oxford-street, which business will be carried on by his widow.

About the time of the erection of the Albert Memorial, his photographs of the groups of statuary forming parts of it attracted attention. Later, his photographs of numerous Tinworth panels, taken on 23 × 18 plates, some of which were exhibited on the walls of the Royal Photographic Society's Exhibitions, brought him more into prominent notice. Latterly, he produced a very large number of cathedral interiors of a similar size. For some years he was a regular exhibitor—principally at the Royal and Falmouth, and received nearly thirty awards.

As a platinotype worker he was well known, and was almost the first, if not the first, to publicly demonstrate the hot-bath process, and handled with great ease prints of nearly fifty inches in length.

In July, 1889, he was unanimously appointed President of the South London Photographic Society, and was annually, without any opposition, re-elected to that office. His genial and kindly manner will be much missed by the Society, and, while having the courage of his opinions, he was a man unwilling to offend any one. The results of his experience were always at the disposal of any photographer, either amateur or professional, who consulted him. In the competitions inaugurated by B. J. Edwards & Co. and Messrs. Lumière, he was a prize-winner, in the first securing the premier award.

At the time of his death he was forty-nine years of age, and passed away after an illness of seven weeks from blood poisoning. It is felt that his illnesses, from which he suffered two and five years ago, may have accelerated his decease.—I am, yours, &c.

CHAS. H. OAKDEN,
Hon. Secretary South London Photographic Society.
30, *Henslowe-road, East Dulwich, S.E., October* 25, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

RECEIVED.—W. C. B.; J. T. HEAWOOD, and others. In our next.

YANKEE.—Messrs. Wellington & Ward, Elstree, Herts, coat and supply such paper.

H. J. WEBB.—In this country we have never heard the word pronounced except as it is written.

B. J.—See THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897, in which the necessary particulars are given.

SCAMP.—Address Messrs. R. W. Thomas & Co., Thornton Heath, S.E.; and the Secretary of the Affiliation of Photographic Societies, 12 Hanover-square, W.

TONING.—SEPTIMUS. The "peculiar appearance" of the prints sent is easily accounted for; they were toned in too strong a light, and the light fogged them while toning.

RESIDUES.—DISSATISFIED. As you have no idea of the quantity of silver there was in the waste, how is it possible for you, or any one else, to form an opinion as to whether the return made by the refiner was just or not? The mere weight of the residue is no criterion at all.

PORTRAIT LENS.—W. WENBORNE. A portrait lens of the Petzval type, of eight inches equivalent focus, will not, even when well stopped down, cover a whole-plate with even illumination. A lens of the rapid type will, however (if a good one), do so fairly well, that is, provided a small stop be employed.

MOUNTS.—H. W. C. Both the mounts sent are of a very common quality, so far as the board is concerned, though they are showy in appearance. It does not follow, however, that, because a mount is of common material, it will necessarily act injuriously on the prints. That can only be ascertained by testing.

NOTICE TO EMPLOYEE.—ASSISTANT. Yours is a very common case, we are sorry to say, but you have no remedy. As the agreement for a year certain, if you suited, was only a verbal one, you can only claim a week's notice. Too many employers engage assistants at the beginning of the season at a low salary, under the promise of a "permanency," and then discharge them when the season is over. A written engagement is the only remedy.

BLISTERS ON ALBUMEN PAPER.—TROUBLED. The best way to avoid th blistering, if the sample of paper used is prone to it, is this: Befor washing the free silver out of the paper, immerse the prints for minute or so in methylated alcohol, then wash and tone as usual. Thi method has never failed in our hands, even with the most troublesom samples.

REMOVING PAINT FROM GLASS.—STIPPLE writes: "In the summer, I stipple some of the glass of the studio over with paint, and, now the dul weather has arrived, I want to get rid of the stippling. Can you tel me the readiest way to do it?"—Make a strong solution of America potash, and apply to the paint; it can then be easily removed with broad chisel or a palette knife.

OPALINES.—E. P. C. writes: "Could you let me know, through the mediur of your paper, the best and most lasting way of mounting silver print on glass for opalines? I have tried starch and gelatine, but they alway come up in a short time."—We know of nothing better than gelatine o starch for the purpose. The trouble has, no doubt, been due to th glass not being thoroughly clean.

PLASTER FIGURES; STUDIO.—F. C. HAWKE says: "Will you please let m know, 1. Where can I obtain some good plaster figures? 2. Wha quantity of glass shall I require in a studio 16 × 8? I thought of havin one side of the roof glazed for 9 feet of its length, and one side glaze 9 feet × 3 feet?"—In reply: 1. Brucciani, Russell-street, Covent Garden 2. The proportions of glass will do very well.

STRIPPING FILMS.—LITHO asks the following: "How can I strip a gelatin film from the glass? In some experiments I am making I want th negative only as the gelatine film. I know, if I get it off the glass, i will be difficult to handle, and it will probably be larger than its origina size, but that will not signify for my purpose."—The matter is eas enough. Simply immerse the plate in water to which a few drops, pe ounce, of hydrofluoric acid has been added. The film will gradual detach itself and float off.

TONES IN LANTERN SLIDES.—W. BIRD writes: "Do what I can, I do not ge warm tones in my lantern plates; other people get them, but I can' I have tried nearly all the lantern plates in the market, but they a seem alike in my hands. The two I send are a fair type of the best can produce."—The cold tone, or we might say lack of warmth, is du to insufficient exposure. To get very warm tones, two or three time the exposure given would be necessary. Read the instructions ser with the plates, and note particularly what is said as to the exposur for different colours or tones.

TONING.—W. B. EDWARDS asks: "Will you kindly tell me where I am wron in the following? In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANA for 1896 the following formula appears for toning P.O.P,: (1) Borax 600 grains; water, 160 ounces. (2) Gold chloride, 15 grains; wate 15 ounces. I toned some prints, and, when I put them in the fixe they went like one enclosed. How do you account? Does the pape want washing before toning?"—The prints certainly require washin before they are toned. The borax bath does not suit all brands o gelatine paper; and, if you do not get on with that one, use the sulph cyanide bath.

THE CAMERA CLUB JOURNAL.—ANASTIGMAT says: "In last year's ALMANA mention was made of a paper which Mr. W. K. Burton contributed t the October, 1895, number of the Camera Club journal on a simp method of measuring the defects of curvature and astigmatism that ma be present in modern lenses (see page 639). When the ALMANA appeared, it was tantalising to find that the number of the Camera Cl journal referred to was already out of print. As the instruction so able a writer as Mr. W. K. Burton would, doubtless, be valued many readers of the ALMANAC, would it be possible to reprint it? not, can you say if the paper mentioned has been published elsewhe than in the Camera Club journal?"—In reply: The paper has not bee reprinted. If possible, we will give the desired information in an earl issue.

SOUTH OF FRANCE.—J. C. writes as follows: "I would be very much oblige if you would help me in the following: My health has been very ba lately, and I am sure of having a relapse when the cold weather comes o I was in —— during the season, where I managed to make a fair bus ness by putting cards in hotels and houses, and calling. You might l me know if I could do a little work on the same principle in any of th resorts in the South of France; if not, could you recommend me to an other place? If you know, you might favour me by letting me kno the cheapest way to the South of France, and in my camera, which is 12 × 10, and also porcelain dishes, &c., would the Custom duties l high?"—We are sorry we cannot give our correspondent the informa tion desired, as we are not familiar with the South of France. Perha some reader will kindly advise. There will be no duty on the thing if they are for use and are not new.

SPOTTY PRINTS.—T. PINDER writes: "We should be pleased if you wou kindly state the cause and remedy of these black spots on the enclose gelatine chloride prints. They are constantly coming on the prints, an cause great waste. They are toned in the sulphocyanide bath, and the are fixed in the ordinary fixing solution. The spots appear in the toni bath. We are now putting the toning solution through a muslin ba but they come on the prints just the same. We also have a muslin be over the water tap, and the sink is perfectly clean. We think they a iron stains, but we do not know the cause of them. We use porcela dishes to tone and fix in."—The spots are clearly due to particles foreign matter coming in contact with the prints while in a moist co dition, but from what source it is impossible for us to say. The mos likely sources, however, are particles of dust from the work-roo floors, in the shape of such things as pyrogallic acid, hyposulphite soda, &c.; or it may be minute particles of iron in the washing waters.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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NOTICE OF REMOVAL.

JANUARY 1, 1898, THE OFFICES OF THE "BRITISH JOURNAL F PHOTOGRAPHY" WILL BE REMOVED TO NO. 24, WELLINGTON-TREET, STRAND, LONDON, W.C.

EX CATHEDRÂ.

readers will observe that immediately preceding these s notice is given of the forthcoming removal of the offices of BRITISH JOURNAL OF PHOTOGRAPHY to 24, Wellington-street, nd, London, W.C. The new premises are considerably superior of the old in extent of accommodation and suita-y of situation. The inadequacy of the premises at York-et to the growing needs of the business and Editorial artments of the JOURNAL has long engaged the anxious ntion of the proprietors, and it is anticipated that removal Wellington-street will provide the increased facilities uired, and will promote not only our own convenience, but t of the JOURNAL'S very many friends and supporters.

FOR thirty-three years out of the forty-three that it has been established, THE BRITISH JOURNAL OF PHOTOGRAPHY has been published at No. 2, York street, Covent Garden. We trust we may be pardoned the expression of the feeling that, in recording the close of this long chapter in the history of the JOURNAL, we are alluding to a subject whose interest reaches beyond even the wide circle of our own readers. Not only does THE BRITISH JOURNAL OF PHOTOGRAPHY rank as the oldest existing photographic newspaper in the world, but among the technical Press, which yearly grows in extent and importance, it has very few seniors in age. In many respects the history of photography during the last forty-three years is bound up with the history of this JOURNAL, and its old offices in York-street, have so long been the point to which so much that is of importance in photography has converged, that it is not without some little pang of regret that we announce the forthcoming removal. For the information of readers at a distance, we may say that the new premises are only distant some thirty or forty yards from the old.

* * *

OUR contemporary, the *Stationery Trades Journal*, gives, in its October issue, an admirable illustrated account of the works of the Photo-chrom Company at Tunbridge Wells, at which place the Company some time ago acquired the business of Mr. Carl Norman. That gentleman is now technical manager, the managing director being Mr. E. Llewellyn White. The business of the Company at Tunbridge Wells embraces the large view trade originally established by Mr. Norman, as well as the production of half-tone blocks, and the two branches of the works are minutely described. The coloured views, for which the Company has rapidly built up a world-wide reputation, are produced, as hitherto, at Zürich.

* * *

THE information, specially addressed to the stationery trade, which is contained in our contemporary, appears useful and well selected. Its Paris correspondent gives the following account of the Dansac-Chassagne colour process, some parts of which are amusing when read by the light of what has already appeared on the subject in our columns. "And, first, I must devote a good space to a new French invention, the Radiotint, which is being extensively boomed. It is a new method of colouring photographs; but, whereas by the old method the colourist had to be almost an artist, and work almost as care-

fully as though he were painting a miniature, this process is almost automatic, and can be done by any child who is old enough to use a shilling painting book properly. The discovery of the process is due to a young doctor named Adrien Michel Dansac. He was, I have heard, employed in the Pasteur Institute, his work being to colour the fluids which contained bacteria or microbes, in order that they might be rendered more visible under the microscope. What liquids he used for this purpose I am unable to say; the secret is his own, and will, doubtless, be a profitable one; but I presume they were aniline dyes of some sort, such as are generally used by microscopists for staining preparations. Photographs of these microbes used to be taken, and one day the operator spilled some of the colour on a photograph. It made an ugly stain, which he tried to wash off, but found the colour was fixed. He tried further experiments, and, after many attempts, found that with three colours only and a bottle of medium he could obtain the whole series of colours.

* * *

"He took into his confidence a gentleman who had been manager of one of the great stores in Paris. Offices were secured, boxes containing the four bottles were prepared, specimens of coloured photographs were sent round to all persons interested, and large sums were spent in advertising. The process is very simple. The photograph is first wetted all over with the medium, and then the colours, which, singular to say, are blue, green, and red, are applied either singly or combined in certain proportions, which are indicated in the pamphlet which accompanies the box. Being somewhat of a painter myself, I failed to see how the yellows were to be obtained, but I was assured that they came out quite well. I have seen specimens of the work, and found some of them excellent, but others not quite so good. Perhaps this was due to want of experience in the operator, or it might be due to some slight fault in the preparation, or to the fact that some colours come out better than others. But, on the whole, the effect is very good, and the work is much better than that done by the generality of colourists, whose art education is generally defective. The most serious drawback to the process becoming popular is the price charged for the box. The price is a sovereign, and, even allowing a couple of shillings for the neat case, the colours seem to come rather high. It is true that it is not everybody who wants to colour photographs, and the professional colourist would not mind an outlay which would enable him to get through his work in a tenth of the time with satisfaction to himself and his employer; but, if the public has to be educated up to tinting its own photographs, the price will have to be reduced. If this can be done, and a good margin of profit left, it would seem safe to prophesy that the radiotint will enjoy a large sale, not only in France, but also in England and the United States. The invention has, I understand, been protected in every country in which such protection is deemed valuable."

* * *

The Radiotint Company have offices in London, but we do not hear much relating to the progress of the process. It is probable that, before long, we shall have some interesting communications on the subject of the financial aspects of colour photography to make to our readers. History appears to be repeating itself in connexion with the matter, and we hear of no less than three new processes that are to be exploited. Possibly one of them is that which is described in another part of this week's Journal.

* * *

Messrs. Lichtenstein & Co, of Silvertown, who make caramel specially for the purpose of backing plates, send the following interesting note, suggested by recent references in our columns:—

"I have been very reluctant to be drawn in this matter, as I had some doubts as to the applicability of caramel for the purpose. The plate-makers have, however, selected one variety of caramel, which they employ successfully, but I do not know the precise method. Amateurs appear to think they have only to slap on any caramel, and the thing is done. I have been bullied for not sending on demand free samples to the secretary officials of a camera club, who had got up a competition. The amateur photographic world seemed to have concluded that we were made to feed with free samples the fires of their experimental and inventive genius. If you have space to announce that our caramel, as successfully used by plate-makers, may be had through any photographic dealers, kindly say also that we cannot attend to applications for samples unless accompanied by remittances."

* * *

Messrs. Ross, Limited, of 111, New Bond-street, inform us that the Examining Jury of the Brussels International Exhibition has awarded them a grand prix, a diploma of honour, a gold, a silver, and a bronze medal diplomas for their exhibit at the Exhibition, and that the award has been confirmed by the Superior Jury.

LENSES FOR PHOTO-MICROSCOPIC WORK.

The season for outdoor work is now over with the large proportion of amateur photographers; still there is plenty of agreeable work for them to be found indoors, such as lantern slide making, enlarging from negatives taken during the summer, &c. One very interesting occupation for the amateur as winter work, is photo-microscopy, and the lecture by Dr. Edmund Spitta, F.R.P.S., M.R.C.S., on the subject, at the last meeting of the Royal Photographic Society, comes very opportunely just now.

Many amateur photographers are deterred from taking up this very interesting branch of the art, on the supposition that costly apparatus and appliances, that they do not possess, are necessary. That is not the case, however, as we have on former occasions pointed out, except when the higher degrees of amplification are desired. The ordinary enlarging camera, and a photographic lens of short focus, with very little in addition, will serve very well for tolerably large objects, where an enlargement of few diameters only is required, as, for instance, in the case of the proboscis of the blowfly, wasp's tongue, flea, sting of bee, wings of insects, botanical specimens, sections of woods, rocks and the like. These, and no end of others, are very beautiful as well as popular subjects, and always meet with appreciation when projected on the screen, and they are well within the compass of a photographic lens. An enlargement of from six to a dozen diameters, with objects of this kind, will be quite for the lantern-size picture.

In his lecture the other night, Dr. Spitta re-echoed the opinion we have expressed on former occasions, namely, that for low-power work a photographic lens is preferable to

power microscopic objective. Of course, when using a photographic lens, unless it be of very short focus, a long extension of camera is necessary. For example, if a lens be used such as quarter-plate hand cameras are generally fitted with, which are usually about five and a half inches focus, an enlargement of, say, six diameters would require an extension of camera to from thirty-five to forty inches, and that is not a greater one than most enlarging cameras will extend to. A lens of the above focal length may be used, but it will prove in practice less convenient than one of shorter focus.

Some years back, both the late Mr. Dallmeyer and the late Mr. Ross put upon the market miniature lenses of the Petzval form, of about two inches equivalent focus, for taking "postage stamp" portraits; the price of them, we believe, was about two pounds each. We do not know if they are supplied now; but, if not, they are frequently to be met with second-hand at a much lower price. These lenses gave exquisite definition, and, with one of them, we have produced photo-micrographs of such things as the proboscis of the blow-fly, tongue of wasp, and like objects, with such fineness of definition as could not be excelled, if equalled, by the most costly microscopic objective. There is this advantage in using a photographic lens, namely, that for this class of subjects they can be used with the full aperture, about *f*–4, thus curtailing exposure. In enlarging, it is well known that the lens employed should be one that is equal to taking a negative the size of that to be enlarged, and, as these miniature lenses were constructed to take pictures about an inch square, it will be seen that, with the full aperture, large microscopic objects are well within their capabilities.

We have just said that we are not sure that these miniature portrait lenses are now being made, but we do know that lenses of the rapid rectilinear type are made of two and three inches focus, for stereoscopic purposes, and they would do admirably for the work, though they would be somewhat slower in action than those just referred to. Short-focus lenses are also being made for cinematograph purposes, but we have not tried any of them for photo-micrographic work; but there is no reason why they should not answer. Another advantage of a photographic lens over a microscopic objective is that, when photographing opaque objects with an unequal surface, which has to be done by reflected light, it may be stopped down so that great "depth of focus" can be obtained. Thus all the different planes of the object will be sharply defined. Our readers do not require to be told that in using these miniature lenses, of the Petzval form, that the posterior combination must be next the object to be enlarged, as in enlarging from a negative.

One very important point in connexion with photographic lenses for photo-microscopic work is, that the quality of the instrument is an important factor in the case. It must be a really good one, otherwise it is worthless for the work. Some "postage stamp" or "gem" lenses, of foreign make, which are now sold here for a few shillings each, cannot be expected to yield good results in photo-microscopy.

ON THINGS IN GENERAL.

If the Photographic Salon has had no other effect, it has undoubtedly caused photographers to think. It has shown them that it is possible to work in other directions than that indicated by the groove, narrow or wide, in which so many have been wont to travel. Possibly some of my readers will say the ancient Greeks also made their sons to think by means of a well-known object-lesson. Their exhibition was that of a drunken helot, who was shown to the rising generation as a conspicuous example of what to avoid, and so I may be told the existence of the Salon may be beneficial on similar grounds. Truly I myself was made to think, when I received my last British Journal of Photography, and perused the latest delivery of our genial mentor, H. P. Robinson. As I read the article from his pen, before arriving at the signature, I felt highly amused at the remarks of one who was evidently the "candid friend," but, when I did get to the signature, I had to rub my eyes and endeavour to decide whether I was awake or asleep; but, no, there was the signature, plain and unmistakable. "Save us from our friends" might well be said when we read of "a splendid failure, and an example for all exhibitors, especially the Royal Photographic Society of Great Britain, of what not to do." I have never professed any admiration for the works of the Salon as a whole, but that the institution of that Association has had a lasting effect on photographic art can scarcely be denied, something, indeed, akin to that of the original band of the pre-Raphaelite brethren upon the painter craft. One of the Slade Lectures, delivered by the painter who is now President of the Royal Academy, contains a passage that, to my mind, could be translated into photographic language with great fitness. Speaking of the pictures of that class, and their crude colours, "The idea was carried so far that the use of these colours was considered as a sort of test of the earnestness of a painter in his work, and they were even invested with a sort of religious halo. Here, then was a case where the idea completely outmastered the impression. . . . . Sometimes it is a religious, sometimes a sentimental, sometimes a scientific idea which obtains possession of a painter's mind, with the effect of deadening his true artistic impressions. The cause may be found in the want of training common to English artists, which leads them to reject, through ignorance and prejudice, what practice and experience have shown to be convenient, if not necessary, modes of procedure." The matter in a nutshell if for English artists we substitute fuzzitype and Salon photographers! I will end my remarks on the burning question with a riddle I heard put the other day, "What is the difference between poverty in the East-end and the Photographic Salon?" Most of those who had the question put to them said, "No difference;" but the propounder replied, "The one is miserably true, and the other is truly miserable."

I think the Editor has done good work in calling attention to the exact position in which users of acetylene stand to their insurance companies. It is all very well for the insurers to say, "Oh, the insurance offices won't care to fight a claim; they are generally ready to meet one in a liberal spirit." To a great extent that is true; but, when it is remembered that the moment a fire of any magnitude occurs an appraiser is sent down, and that he is a lucky insurer who does not find his bill quickly cut down very seriously and an offer made on the cut-down basis, it will at once be seen that the insurance companies must have the whip hand all through. "Take it or leave it; if you go to court, we shall defend, and decline to pay a single penny; you have vitiated your policy by using acetylene gas."

I should not be surprised to find, if it has not already taken place, that the insurance offices will consider cinematograph exhibitions as special dangers, and that they will charge for them as further risks, for the instrument has come to stay, to all appearance. By the bye, in referring to the older instruments for showing moving figures, most writers go back to the zoetrope, which some quarter of a century ago was sold in such immense numbers. Now that instrument was merely a resuscitation in another form of a far older instrument. I well remember seeing, nearly fifty years ago, a circular card, on the outer portion of the front of which was drawn a series of pictures representing successive phases in the positions of a dog jumping. Between each picture was cut out a narrow slit, and the whole card was made to revolve round a pin running through the centre of the circular card, and held firm by being pushed through the ends of a wooden slit-holder, the card revolving in the slit. The impression of motion through successive presentation to the eye of the various pictures was obtained by the simple expedient of facing the pictures to a mirror, and observing from behind them, through the periphery where the slits were pierced. There was thus an alternation of picture and blank, picture and blank; the blanks were not seen, and the picture with the objects in motion

was apparently fixed in one place during the whole of the revolutions of the disc.

The air has been so full this last year or two of photographs in natural colours that it is difficult to fix a period in the perennial cycle as to when to expect the next process to be launched on a confiding public and the trustful leading-article writer. Every one who has observed matters photographic for the last quarter of a century is aware that these projects are launched about every two years or so. But at present the Dansac-Chassagne is perhaps too prominent in the recollection of the public; otherwise the time is approaching. What a grand description of the "D.C." is quoted in recent Foreign News and Notes in these pages from the *Photographische Mittheilungen!* One need not be a German scholar to be able to guess the meaning of the "Plumpsten Schwindel," by which term the editor of that periodical describes it.

I am very curious to know something more about this *argentaurum* process of making gold out of silver. I should not like to say right out that it is another of the Plumpsten Schwindel; but, if we read history aright, that is what ought to be anticipated. If the conversion is genuine, and the inventor has nothing up his sleeve, why does he not keep it to himself, go on making and selling the nuggets, and retire on a competency? There are too many living in the City who could tell a tale about making silver. Some good number of years ago, it is quite true, I believe, that fifteen thousand pounds were made, but not by a process of alchemy—it was out of the pockets of the members of a confiding syndicate. Alchemy as a good paying business needs handling by a genius; at present shares in it are not "gilt-edged."

"*Spurious Platinotypes*" are discussed by the editors in a recent reply to a correspondent, and they say they do not think that *many* London photographers do produce such work, *i.e.*, send out bromides and call them platinotypes, charging a higher price for them. I do not think it matters much whether the knaves who do this sort of thing live in the metropolis or in the country; but, of my own personal knowledge, I can say that the practice is by no means unknown. This is one of the things that might well be taken up by the profession, for it will eventually lead to such a bad name being attached to platinotype work that the public will fight shy of it. Would not the platinotype-paper makers take it up and institute a prosecution? One prosecution would be enough to stamp out the nefarious business. This kind of turpitude is, however, no new thing in the profession. Many years ago the Wothlytype process (a uranium printing process) was well before the public, and the most common way of sending out Wothlytypes was as a masked oval on a white ground, the colour having a sepia character. I remember well meeting at the house of the leading optician of the day a little party of prominent photographers, and one (a portraitist) told us an excellent joke how he was doing thousands of "Wothlytypes," which were merely ordinary silver prints toned brown, and printed with a mask so as to resemble the genuine pictures. It did not strike me as a joke, and it would certainly not strike the spurious platinotypists as a joke if they got brought before a magistrate for obtaining money under false pretences!

FREE LANCE.

BY THE WAY.

AT the time of writing I have not yet visited the Salon, so cannot say much about it from personal knowledge, and by the time my next month's notes are due it will have passed out of recollection; but, if I have not seen it, I have read so much about it, friendly and otherwise, that I have very little difficulty in mentally picturing it as it is—not much different from former years, except that its eccentricities take new forms, and with the better class of photographic work gradually dwindling in quantity, until, I suppose, in another year or two, it will do itself and its promoters justice, and assume its proper character by casting aside the trammels of ordinary photography, and adopting the independent position it ostensibly started to fill.

What the precise position is to be is not yet very clear; but, taking this year's "explosion" of gum-bichromate productions as indicating the direction in which the tastes of its chief supporters are tending, it is not difficult to foresee that it must throw off its allegiance to photography. Whether the "artists" will receive it with open arms remains to be seen; but, from the published criticisms from art sources, it seems doubtful. Painters are too jealous of photography, as being a "mechanical" process, to recognise as "artistic" the productions of a small band who, while avowedly eschewing photographic methods, really practise them under the thin veil of "individual control" as exercised by means of the mop and sawdust bath. Rather, I fancy, will they regard them in the light of being either incompetent or too lazy to master the difficulties of elementary draughtsmanship, and not honest enough to acknowledge the deficiency, and will look upon their surreptitious application of mechanical methods as against them rather than in their favour.

There is no reason why the Salon and its supporters should not occupy a recognised and *bonâ-fide* position, distinct altogether from photography in its scientific aspects and yet not fully identified with art—*i.e.*, art from the painters' point of view—for, so long as they employ the camera, it is to be feared they will never secure full recognition in that direction. But, before this occurs, they will have to drop the tone of superiority they have all along assumed, and that "aggressiveness" which is becoming a little flat and more than suggestive to outsiders that they really feel that they are not succeeding as well as they ought to do or would wish. They must try and believe, difficult though it may be, that probably quite as honest and strenuous efforts had been made in the direction of artistic photography before the days of the Linked Ring, and that perhaps, as far as the limitations of photography permitted in those earlier days, as great a measure of success had attended those efforts. In fact, Mr. Maskell and his friends must attempt, if they cannot fully succeed in doing it, to disillusionise themselves of the belief that the grand transformation scene commenced when the Dudley Gallery opened its doors to their first show.

We have read a great deal lately about the "influence" of the Salon upon Art Photography, and the manner in which it has reacted upon the rival Exhibition, and even upon the manners, and habits and ways of the Royal Photographic Society. As a rule, I am content to attach no greater importance to such opinions than I do to most of the subject-matter of the Salon "forewords;" but I can't help, metaphorically speaking, "kicking" when I find so old a "parent" man—though also a "Salonite"—as Mr. H. P. Robinson repeating the same lay as he does in his Digressions last week. He there distinctly states that it is by careful imitation of the Salon that the Society has been able to get together a really interesting Exhibition. Fie, Mr. Robinson, I am surprised!

Are we to believe that it is entirely due to the influence of the Salon that such work as that turned out by Colonel Gale, Horsley Hinton, Craig Annan, W. Crooke, J. H. Gear—to mention only a few names that come to my pen point—is to be traced? I will go "one further," and ask, Is it "Salonic" influence that changed the style of H. P. Robinson's own work from, say, *Bringing Home the May* to that of *Wayside Gossip?* I say, "Rubbish," nonsense, or anything stronger you please. The change had commenced long before the Salon was dreamt of, not only in "H. P. R.," but in photography generally, simply by reason, as I mentioned last month, of the increased capabilities of photography itself or its processes. The change commenced and has gone on naturally without being, I believe, in the faintest degree "influenced" by the Salon, unless possibly, it may be for the worse.

It so happened that, at or about the time the Salon started, certain prominent members of the parent Society dissociated themselves from the old body, and were afterwards found connected with the new "show" when it commenced to agitate the photographic world. But, in speaking of the Salon or anything "Salonesque," does any one ever think of identifying either one or the other with such works as those of H. P. Robinson or Horsley Hinton? Bah! Both those workers are noted for the excellence—I was going to say the perfection—of their technique, but reminiscences of the earliest out

break of the Salon and of each succeeding year are wholly and solely in the direction of eccentric—ay, I must say it—faulty technique. And now we have piebald gum bichromate!

From its earliest to the present day, in fact, the Salon has been noted for eccentricity and absurdity, and for its hatred of Pall Mall. It has always been able to show some good work; but this, I take it, is mainly due to the quarrel with the parent Society already alluded to. Two or three prominent and leading workers cast in their lot with it, and gave it respectability, others followed; and so it happened that it has escaped being the ghastly show of indifferent pinhole pictures and fuzzytype puzzles it might otherwise have been until the gum-bichromate craze cropped up. But I am told that this year it is weaker in the direction of good work than it has ever previously been, and, curiously enough, the Pall Mall show is acknowledged to be better; so that, if the Salon has in any way "influenced" the parent Exhibition, it is only in having kept away from it, perhaps, in former years, a certain amount of work that should have legitimately gone there.

I repeat there is no reason why, if properly conducted, the Salon should not occupy a recognised and honourable position, instead of being the butt of everybody, even its own friends. It need not necessarily be run on conventional lines; there is no sin in originality if it does not take the form of absurd eccentricities, and self-respect and self-reliance are always admirable so long as they do not run to conceit. If the promoters of the Salon will map out a definite course for the future, and drop the fantasy of being the leaders and teachers of photography in all that is virtuous, they will have no difficulty in finding good and reputable support; but, if they persist in the attitude of "superior aggressiveness," I am afraid their *clientèle* will soon dwindle down to a few high-art photographers, who do the "usual thing" in a provincial town for 10*s*. a dozen cabinets and 5*s*. *cartes*, and send their "art" productions to the Salon, because Pall Mall only accepts photographs.

DOGBERRY.

FOREIGN NEWS AND NOTES.

Cleaning Lenses.—The well-known optician, Dr. A. Miethe, has given some useful information in the *Central Zeitung für Optik und Mechanik* concerning the preservation of lenses. Glass is a comparatively soft substance, and the fine dust deposited from the atmosphere consists mostly of minute grains of sand, at least one and a half times as hard as glass. Optical glass is softer than ordinary window glass, and to the all-pervading deposit of dust are due most of the scratches and consequent deterioration of lenses. Any material used in the process of cleaning must, therefore, be free from dust, and possess other requisite properties. First amongst these is a capacity for removing grease. Leather is frequently recommended for cleaning glass, especially wash-leather; but it is very unsuitable, as it does not remove grease, and may sometimes deposit it. Well-washed cotton cloths are far more suitable. Linen especially has the property of removing dirt and grease from glass, but it is difficult to clean quite close up to the mount with a cloth, and for this purpose pith is most suitable. The best varieties of pith are obtained from rushes, the sunflower, or the elder-tree. For cleaning large lenses circular pieces of pith are glued side by side on a piece of cork, and this species of brush is passed over the surface of the lens without too much pressure. Small lenses may be cleaned with short lengths of elder pith, which may be pointed when necessary. Sometimes the dirt and grease cannot be completely removed by the process of dry cleaning, and it has frequently been recommended then to use fine precipitated chalk or rouge. Both materials are quite unsuitable, and may completely ruin the figure of the lens, or at least affect its polish. If dry polishing fails, the dirt must be removed by chemical means that will not attack the glass. Alkaline solutions, such as ammonia, caustic soda, caustic potash, soda, or potash, may not be used—at least, such is certainly the case with some of the better lenses. They attack the glass, and repeated use will destroy the surface. In a lesser degree this is true of water also if the glass is long in contact with it. The least harmful fluids for the removal of dirt are rectified oil of turpentine, absolute alcohol, and ether. The surface should be moistened with turpentine, rubbed dry with a linen rag, and then polished with a little ether. Turpentine being a solvent of Canada balsam, care must be taken to keep it from the edges of the lenses, where they are cemented. If any spots cannot be removed by these means, the lens should be sent to the optician to be repolished.

Viscosity of Collodion.—Writing in the *Photographische Mittheilungen*, Dr. E. Vogel expresses the opinion that many of the troubles incident to the use of collodio-chloride paper may be due to unsuitable condition of the collodion in respect to its viscosity. A certain make of paper may give satisfaction for considerable time, and then suddenly give trouble by cracking. Probably a different collodion has been used, which, from its toughness, gives a thicker film. The collodion should always be tested, and for this purpose a glass tube, 20 cm. long and 2 cm. in diameter, drawn to a point, should be used. The aperture at the point should be 1 mm. Make a mark on the tube near the top. Fill the tube with water to this mark, and find how long it takes to run away by the fine orifice. Try the collodion in the same manner, and note the difference. The thicker the collodion, the more time it will take. Two samples tried by Dr. E. Vogel gave the same result, although one contained less than half the pyroxyline used for the other. It would be an advantage if the viscosity of the collodion were specified in all formulæ for negative work and collodion emulsions.

Toning.—Dr. Eder reminds photographers of an old but very good and simple method of keeping solutions of chloride of gold in proper condition. Complaint is often made that the toning bath only gives foxy-brown tones. It is important that the bath should be neutral if dark violet-black tones are required, and this condition is especially necessary with an acetate or borax bath used before fixing. The stock solution of chloride of gold, usually kept diluted to 1 in 50 or 1 in 100, should be neutralised by the addition of a small quantity of precipitated chalk. This combines with the free acid, and keeps the stock in good condition. The solution may be filtered, but the sediment is harmless, even if it gets into the toning bath.

The Evolution of Photography.—A summary of Professor H. W. Vogel's paper, recently read at the Congress of German Naturalists and Physicians, is given in the *Photographisches Wochenblatt*. Professor Vogel emphasised the fact that photographic processes extend far beyond the limits of ordinary photography, and instanced the enormous production of chlorophyl in leaves, under the decomposition of carbonic acid and the evolution of oxygen, a process that must have been far more extensive in the past than in more recent times. This process must have reduced the amount of carbonic acid in the atmosphere and increased the oxygen, thus preparing the way for the human race. Light also disinfects our rivers. It bleaches dye stuffs, and, in this respect, it is estimated that the loss to Germany amounts to 350,000*l*. annually. On the other hand, it produces the ancient Tyrian purple dye. Its action is also necessary to the formation of another substance on a colossal scale, the sugar of our households. Girard is of opinion that sugar is formed in the leaves of the beet during the day, and stored in the root at night. Draper pointed out, in 1841, that the action of light on the silver salts depends upon its absorption by the sensitive substance. The speaker extended this proposition by saying that not only the light absorbed by the silver salts, but also that absorbed by other added substances, plays a part. Dr. J. H. Schulze, of Halle a/S., was the first to use light for the production of an image. This was in 1727. When Daguerre, in 1839, discovered how to develop an image, photography assumed a new phase. Talbot introduced paper as a support for the sensitive film, and discovered how to develop iodide of silver by the wet process. By thus introducing the negative he converted photography into a printing method. The invention of the dry plate was also an important step, and extended photography to the domains of science, art, and manufactures. The speaker also referred to orthochromatic processes, flashlight photography, the advance in photographic optics, three-colour printing, and radiography.

The Solubility of Platinum.—In the *Photographische Chronik* it is mentioned that platinum, alloyed with silver, is soluble in nitric acid, and that it is possible in this way to dissolve most of the platinum present. The writer thinks this must be taken into account in toning silver prints with platinum. As a test for the permanence of a platinum-toned print, it is frequently recom-

mended to drop nitric acid on the print and watch for the disappearance of the image. It would, therefore, seem that the test is valueless, as the platinum is in a very finely divided condition in the presence of traces of silver, and therefore soluble in nitric acid.

To Render Old Manuscripts Legible.—We also see the following recommended in the same paper. Most old manuscripts have been written with ink made from oak galls, which may be intensified by brushing over it a one per cent. solution of gallic acid or tannin. When dry, again brush over the manuscript a solution of ammonium sulphide.

Aluminium and Acids.—It is mentioned in the *Photographische Mittheilungen* that, whilst aluminium is easily destroyed by alkalies, it is almost as indifferent to strong acids as platinum. Aluminium may be left for a whole day in the strongest nitric acid and will only be slightly etched. This property renders it very valuable for certain purposes, such as plate-lifters for withdrawing plates from acid baths. For this purpose it is superior to ebonite, and, unlike glass, it cannot be broken.

Large Telescopes.—The *Vossische Zeitung*, in a recent article on the work of the Potsdam Observatory, draws attention to the remarks of H. C. Vogel, that the absorption of light is a factor determining the size of the large refracting telescope now being made for that Institution. Notwithstanding the great transparency and freedom from colour of the Jena glasses used for telescopes, the loss of light is so great, as the size and consequent thickness of the lens increases, that beyond a certain point the gain of efficiency in giant sizes is quite minimal. It was therefore decided to keep to 80 cm. for the diameter of the object-glass of the photographic instrument. The lens will be 12 cm. thick, and it is estimated that 40 per cent. of the chemical rays will be absorbed.

The Gum Process.—From the *Wiener Photographische Blätter* we learn that Dr. F. Mallmann recommends the addition of a little starch paste to give the prints the appearance of platinotypes. Professor H. Watzek gives the following formula:—Forty grammes of gum arabic are dissolved in 100 c. c. of two per cent. boiled starch solution. After adding a few drops of carbolic acid, filter through a cloth. The coating solution is prepared by mixing equal quantities of the gum-starch solution and a ten per cent. solution of bichromate of potash. Two-thirds of the quantity by volume of any suitable powdered colour are then added. If the exposure is correct, the print can be developed without mechanical means, but, if over-exposed, a fine spray of water will produce prints with a fine grain. The paper does not require any preparatory treatment.

The Inventor of Spectacles.—The *Photographisches Wochenblatt* gives the following information concerning Salvino degli Armati, who died at Florence in 1317. His tombstone is inscribed: "Here lies Salvino degli Armati, the inventor of spectacles. May God forgive his sins!" The invention of spectacles for short-sighted, stupid persons was, doubtless, his greatest sin, and required special forgiveness. Alexander von Spina disputed his claim, but it seems probable that binocular spectacles were not made before 1290.

Three-colour Filters.—According to A. Granger, in the *Moniteur Scientifique*, the following are the three light filters used in America for making the negatives for three-colour printing: Violet screen for the yellow-printing plates:—

Concentrated solution of cupric chloride.....	7 c. c.
Ammonia	3 „
Water	17 „

Filter and add concentrated methyl violet β and fuchsine 5 c. c. For the orange screen for the blue-printing plate—

Concentrated solution of chloride of cobalt ..	15 c. c.
Water	35 „
Ammonium bichromate	25 „
Ammonia	2 „

For the green screen for the red-printing plate, a solution of sulphate of nickel. These solutions are used in cells one-eighth of an inch thick.

VARNISH.

The professional photographer who depends on the permanence of his negatives for a good deal of business will always take the precaution of varnishing the film, with the idea not only of protecting it from mechanical injury, such as scratches, but also to prevent any absorption of a silver salt from the printing paper. It is obvious, therefore, that there are two properties which we should specially look for in a varnish, the first a hard non-friable film; and, secondly, impermeability to water or aqueous vapour.

Varnishes may be divided into two main classes, oil and spirit varnishes, and the latter are those which are most used in photography. There is also another class of varnish, but one which is not used much, and that is the aqueous varnish; this has the advantage of penetrating the film to a slight extent, and therefore it gives a very firmly adherent coating, which, however, is not so protective as an oil or spirit varnish, and should only be used as a substratum for one of these.

The simplest oil varnish is ordinary boiled linseed oil; but, unless carefully prepared, it is very dark in colour, dries very slowly, and it is difficult to avoid the occurrence of dust spots, &c., when this is used. A far better varnish may be made by diluting gold size with benzole, as was suggested by Ashman in 1886. He states that, "when pure benzole and ordinary gold size from the oil and colourman's was used in equal volumes, it formed the quickest drying varnish for gelatine films of any mixture that had previously been compounded. Gelatine negatives coated with this mixture became surface dry in a few minutes, and dry enough for printing from in less than half an hour, without the aid of artificial heat, the surface taking the retouching pencil readily. Films thus varnished were placed in water for half an hour without the least injury. This varnish offers a perfect protection to gelatine from silver nitrate solution, and it may be used on any gelatine film with the greatest impunity, whether the same be upon glass, paper, or any other support; it does not become tacky when exposed to the sun's rays, and when dry becomes practically insoluble."

Gold size is a solution of amber or copal in boiled linseed oil, diluted with turpentine, and, whilst the best that can be obtained from the oil-shop is quite good enough, the finest is that sold as copal varnish by artists' colourmen. For those who wish to make copal varnish themselves, Sierra Leone or Zanzibar copal alone should be used. Some boiled oil has to be heated, and also some copal, the proportion being about one of the latter to three of oil. The copal must be powdered and heated till it melts, then the oil added gradually, and the two mixed; this can be easily done if a flask is used, the flask being held by the neck with a cloth and swung round and round. When all the oil has been added, again heat, and, dipping a glass rod into the varnish, take out a drop and put on a plate of glass. At first the drop will be milky, but as the heat is continued the drop will be quite clear, and it is then ready, and should be removed from the flame, allowed to cool for about twenty minutes, and an equal volume of turpentine added. It can then be filtered through muslin, and is ready to be mixed with the benzole.

Possibly, before entering upon the subject of spirit varnishes, it is as well to say a few words about the spirit. Where cost is of no consideration, then absolute alcohol may be used, but, in the ordinary way, methylated spirit is quite good enough. If the ordinary commercial methylated spirit be used, it is just as well to free it from as much water as possible, because a far better varnish is thus obtained. The water may be extracted from any spirit by means of dry carbonate of potash. If an ounce of this be allowed to every pint of spirit, and the necessary quantity placed in the bottle, and the whole allowed to stand for two or three days, with occasional agitation, the potash will absorb the water and settle down to the bottom of the bottle, either as a pasty mass, or sometimes, if there is much water present, as a semi-liquid. Quicklime may also be used for the same purpose. To obtain the spirit after being thus treated, it is only necessary to carefully decant or use a siphon.

Of all the resins employed in the manufacture of photographic varnishes, shellac is the one that is most in general favour; the finest orange shellac alone should be used, and it should be in fairly large laminæ or sheets, and it is advisable to coarsely powder these in a mortar, wetting it with water, as otherwise it is apt to fly about; the powder should then be well shaken up with water to extract any of the red lac dye, and finally, after standing a day or two, filtered through nainsook, and the latter spread out to dry, and the shellac is then ready for use.

Another method of freeing the resin from its insoluble constituent is by the aid of benzine. The powdered shellac may be agitated with benzine, or preferably, for those who have such a thing, packed in a percolation filter with coarse sand, then the benzine poured through it.

If the shellac is already dissolved, then the benzine may be added to the solution, and the two thoroughly agitated. The benzine will float on the top, and may be siphoned off. Frequently it is found, if these little devices are not adopted, that the solution of shellac will not clear; in such a case the only thing to do is to add to the varnish a little powdered pumice stone or plaster of Paris, and shake well. The heavy particles of pumice or calcium sulphate soon sink to the bottom of the vessel, carrying with them the insoluble particles of the shellac resin, and filtration is much more easily effected.

Another, and by no means a novel, plan is to suspend the shellac in a bag of nainsook at the top of a bottle filled with the solvent. The result of this is that, as soon as the shellac dissolves, it sinks through the nainsook, leaving the insoluble matters in the bag. This saves a lot of trouble.

With regard to the composition of the varnishes used in photography, of course we can only say that the number of formulæ is enormous, and one has to meet with slight variations which seem to have no other purpose than just the idea of a variation in the formulæ. In many cases, doubtless, the variation in the formulæ is due to ignorance; that is to say, the variations have been made because in practice certain defects have been found to be existent, and we have no hesitation in saying that, had an intelligent knowledge of the various constituents and their properties been known, no variation would have been made.

If we consider that a varnish is nothing more than a protective coating to the gelatine film, and that it must be not easily abraded, nor liable to powder, and, on the other hand, must not be tacky, nor yet so hard as to crack, we may, by careful choice of ingredients, obtain a perfectly satisfactory varnish.

Amber is the hardest of all resins, but it is rarely used as an ingredient, because alcohol dissolves only about one-eighth, and ether about one-tenth. If the amber be fused, it will readily dissolve in alcohol, and, in its natural state, is easily dissolved by chloroform; but the varnish then becomes somewhat more expensive, though this need hardly be considered if methylated chloroform be obtained. If the amber workings be obtained from a pipe-mounter's, there is no difficulty in fusing it, as it is then in a comparatively fine state of division.

Copal is the next hardest resin, and, if a good sample of Zanzibar copal be obtained, which melts at about 340° C., it is little inferior in hardness to amber, and has also the same disadvantages, that is, it is not very soluble in alcohol, though this may be increased by the addition of camphor. It is very soluble in chloroform and ether.

Shellac gives an extremely hard film, but, unless used with some softer resin, is apt to powder. Sandarac, which is also known as gum juniper, is now a decidedly unsatisfactory resin to employ. It was once really obtained from the juniper, but the two names are now applied indiscriminately to resins from various trees, and the commercial sandaracs are much inferior to what they used to be. W. K. Burton stated about seven years ago that he had actually obtained some true gum juniper, and that it made a splendid varnish, but that, although he had repeatedly tried, he had been unsuccessful in getting the same resin again.

The soft resins include mastic, Canada balsam, and Venice turpentine. This last should be the liquid resin obtained from the larch, but too often it is sophisticated. We might add to these crude turpentine, which, although it is nothing more than a natural solution of common resin in turpentine, possesses totally distinct properties. Of all softening substances castor oil is the best, as both Canada balsam and Venice turpentine dry out in the course of time, and become quite powdery, and thus render the varnish by no means so durable as it should be.

(*To be continued.*)

A RAPID GELATINO-BROMIDE EMULSION.

In the current issue of the *Bulletin de la Société Francaise*, M. A. Blanc gives the following process for making a gelatino-bromide emulsion which will show 25° Warnerke. He notes first of all that, according to his views, a very spongy gelatine film is one, if not the only, cause of green fog, and that there are two principles to be observed in order to obtain extreme sensitiveness and a film that will not frill.

Firstly, it is absolutely necessary that the whole of the gelatine should be used during the digestion of the emulsion; and, secondly, the treatment of the ripened emulsion with alcohol.

The gelatine is treated as follows: Supposing thirty grammes of gelatine are to be used, then it is first soaked for half an hour in water, and then melted on a water bath. To this is added fifty c. c. of a saturated solution of alum. This produces a viscous mass, which should be heated and a few pinches of citric acid added, till it turns liquid again; and it should then be poured out to set and well washed.

The formula employed is—

A.—Gelatine prepared as above	.....	50 grammes.
Ammonium bromide	.....	15 ,,
Distilled water	.....	50 c. c.
B.—Silver nitrate	.....	20 grammes.
Distilled water	.....	150 c. c.

Ammonia, 9 : s to make a clear solution.

B is added to A all at once, and the emulsion digested on a water bath at a temperature of 40° C. for an hour or an hour and a half, or till a flame examined through a drop of emulsion placed on a sheet of glass looks greenish.

After digestion the emulsion is allowed to cool, washed, and allowed to drain, and then covered with alcohol, and left for one night. The alcohol is poured off, the emulsion again washed, melted, and coated.

AN OPEN LETTER TO MR. H. P. ROBINSON.

Dear Robinson,—You deserve every sympathy in the position in which you find yourself through the vagaries of your colleagues of the Photographic Salon. In no sense is this sympathy more due to you than on account of the hanging of the pictures having been removed from the hands of yourself and one or two other members, and thus deprived the hangers of the temptation of placing their own productions in the places of honour. To be reduced from this enviable position, and compelled to see your frames used as part of a decorator's scheme for concealing his sackcloth, is, at least, disconcerting.

Those who have so long looked up to you as the *doyen* of photographic art are, I can safely assure you, much concerned at your treatment. It seems marvellous that one who has so frequently shown his superiority to the laws of Providence by the creation of works of art, with various sources of illumination, should be so shabbily treated.

You are quite right (*vide* Digressions, XXIII., The British Journal of Photography, October 29, 1897, page 693, line 29–30) in supposing that, at the Photographic Salon, "perhaps we are stricken with the prevailing disease in art, hysteria." You are, and the management of the Exhibition has unfortunately always been, in the hands of the hysteriacs; but, taking my view for perhaps of little worth, I think that no one is more responsible for this result than yourself. You have allowed these gentlemen to ally themselves with you, and those who are a little more sane in matters of art had looked on you as a respectable figure-head, who would impart and ensure a certain steadiness to their proceedings.

How have you, previously to the present occasion, made any public protest against the eccentricities into which the management of the Photographic Salon was always rushing? Surely you were not content, so long as your pictures were, whatever their merit, hung in a place of honour?

I must confess that, when I joined the Photographic Salon as an original member of the Linked Ring, I had confidence that the maniacal tendencies of those who are most prominently noted as its inceptors would be tempered by your old-fashioned and reliable steadiness and respect for your representative position in the photographic world.

I clung to the Association, hoping for better things, and that it might eventually prove a solid advantage to photographic art progress; but, after last year's Exhibition, the apparent impossibility of any desirable reform seemed so evident that I could only withdraw from a connexion where I was no longer in sympathy.

Now, I am sure neither you nor any one else cares a tinker's —— whether I am a member, or why I ceased to be one, but it is a relief to me to know that the action, which I took with some distrust, is so well warranted by the statements made public by you, even at this late hour (Digressions, XXIII., The British Journal of Photography, October 29, 1897), and it seems strange that one of your great experience should not have foreseen the way things were going.

You, of course, have made up your mind to adopt the course which I earlier took, which action on your part will, no doubt, be the cause of considerable pain to you, as it will separate you from those most prominently associated with you in the management and hanging of the Photographic Salon, and you all love each other so dearly.

You seem to imply doubt (Digressions, XXIII., The British Journal of Photography, October 29, 1897, page 693, line 33 and *seq.*) in the honesty of the transactions at the Photographic Salon. Strange to say, from my experience there I had a somewhat similar idea, the impression I formed, rightly or wrongly, being that when the members' pictures in large numbers had been accepted, considerable haste was shown in passing through those of outsiders. Perhaps this is now altered, or it may have been my imagination.

The gum-bichromate process, which you refer to in your article above quoted, is a good photographic process, if worked as pure photography, and capable of more than has heretofore been shown. At present the enthusiasts who are "rushing it for all it's worth" apparently base thei

admiration on its possibilities by hand work, and like to see evidence of such work in the form of brush marks on the print. This alone is strong proof of the unbalanced character of their views, and how far they are from having any settled motives in matters photographic. If a platinotype print, showing strong evidence of hand or brush work, is submitted for exhibition at the Photographic Salon, it is naturally rejected. Not so with the gum-bichromate print. Why this distinction? and how can those who make such distinction be trusted with the interests of advanced photography? The gum-bichromate exhibits at the Photographic Salon in several cases almost justify your describing it as a "mongrel process," or it may perhaps be safer to say they are mongrel products of a certain process. In accord with you I also find myself in regard to the triviality and excess of exhibits of M. Demachy's work, but "there are wheels within wheels," which, of course, ought not to be the case at the Photographic Salon.

It is with regret that all must see you in the difficult position in which you find yourself; but, had you, with your assured position as the representative photographer, lost for a time a little of your very kindly disposition and geniality, which we all so much appreciate, and insisted that the Photographic Salon should be carried on in the interest of photographic art, and not for the log-rolling purposes and self-advertisement of two or three members who have captured the show, nor in seeking for a new sensation likely to draw the public shillings, the Exhibition would still probably have had before it a hopeful future, and the call on the guarantors would have been further off than at present.

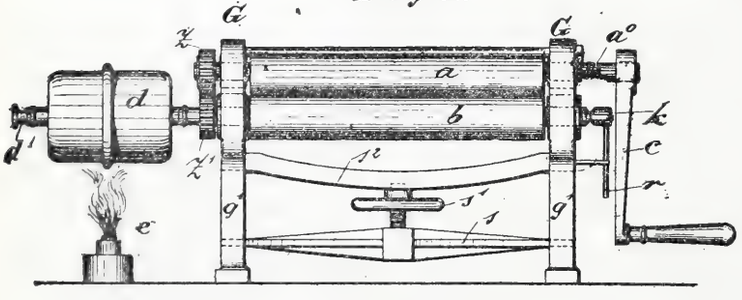
I am, dear Robinson, yours truly,

Camera Club, October 30, 1897. HENRY E. DAVIS.

IMPROVEMENTS IN BURNISHERS.

MESSRS. GEORG MEYER & Co., of Zurich, have patented an improved roller device for burnishing photographs, that is, a so-called steam burnishing machine, which has the advantage over the burnishing machines hitherto employed that the rollers which are to be heated are heated uninterruptedly and quite evenly throughout the operation. The respective roller is formed of metal and is hollow in order to enable it to be heated internally, the heating taking place by means of steam, and the vessel for producing the steam being directly arranged in connexion with

Fig. 1.



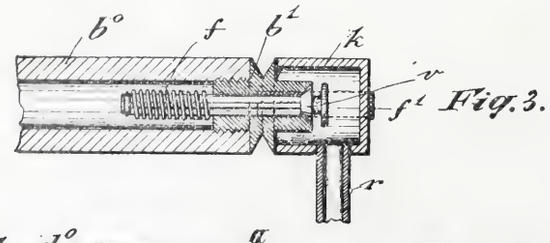


Fig. 3.

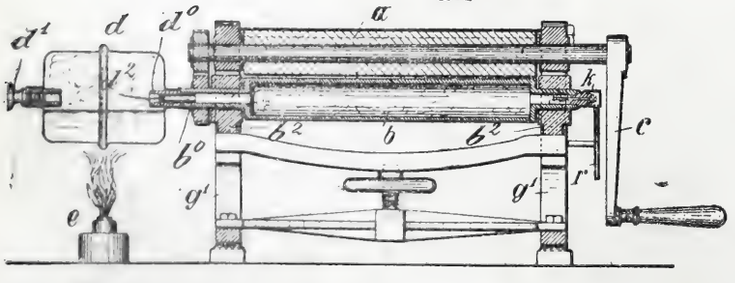


Fig. 2.

the roller at the side of the same in such a way that the hot steam passes from this vessel directly into the roller.

Fig. 1 is an elevation; fig. 2, a vertical longitudinal section; fig. 3, a detail.

The roller arrangement has in the present case two rollers, a and b, which are revolubly mounted in a suitable frame, G, and of which the one roller, a, consists of a suitable material, such, for instance, as caoutchouc, and is preferably solid, while the other consists of metal and is hollow.

The trunnions, b^0, formed in one piece with the roller, b, are also hollow, so that they may serve as steam pipes or passages. A vessel, d, is connected with one of these trunnions (in the present case the left-hand one) by means of a screwed piece, d^2, which is screwed, on the one hand, in the trunnion, b^0, and, on the other hand, in a sheath or socket, d^0, mounted in the mouth of the vessel, d, a washer disc being preferably inserted between the outer edges of the roller trunnions and of the socket in the mouth of the vessel, d. The vessel, d, serves for producing the steam employed for heating the roller, for which object it is partially filled with water and heated by means of some suitable heating substance, for instance, a spirit burner, e. An opening is provided in the end of the vessel, d, opposite to the mouth, which opening is kept closed by means of a screw, d^1, provided with a washer ring, and serves as a filling orifice for the water, the level of which at the highest must only reach up to the inner opening of the socket, d^0 (it is, of course, preferable to maintain the water level not quite so high, but rather somewhat lower). The steam produced in the vessel passes thus through the hollow roller trunnions direct into the roller, b, which is to be heated. In this manner the latter is evenly heated everywhere, and the heating may take place uninterruptedly whilst the roller device is in continuous work, whilst in the roller devices previously employed the heating of the rollers had to take place before use, and could not be continued during their use, so that no continuous use was possible, and, above all things, the heating devices in question guaranteed in no way an entirely equal heating, as is necessary for the working manipulations and the burnishing for producing a good even gloss or polish on the photographs, and as is the case with the present invention, as hereinafter shown.

In order to prevent any overheating of the roller owing to an unnoticed scarcity of water in the vessel, d, whilst the flame or lamp is burning, or, in other words, to render an explosion impossible, a safety valve, v (fig. 3), is provided in the right-hand end of the roller trunnion, b^0, on its mouth, which safety valve, standing under the pressure of a spring, f, is mounted in a socket or bush, b^1, screwed in the trunnion, b^0. Over the valve disc, which has its seat on the outside of the bush or socket, a metal cap, k, is placed, which has a downwardly directed pipe, r, for carrying off any escaping steam. The cap, k, is held on the bush or socket, b^1, or rather on the grooved projecting edge or collar of the same, by means of a clamp spring, f^1, strained over the cap and engaging with its ends in the neck or grooved flange or collar. It is evident that explosions and damage are entirely excluded by means of this mode of construction.

It may also be mentioned that, in the form of construction shown, the rollers receive their rotation by means of a crank, c, engaging on the spindle, a^0, carrying the roller, a, the rotation being conveyed to the roller, b, by means of a pair of cog wheels, $z\ z^1$. An arrangement is also adopted by means of which the distance between the rollers or their circumference may be regulated or varied according to requirements by means of a screw, s^1, acting on a spring curved piece, s^2, supporting the trunnion supports, b^2, and supported by the bar, s, of the frame. Such details, which may be arranged according to requirements, may be modified or omitted. They have, however, nothing to do with the essential part of the invention, but are merely dependent on taste and requirement.

A NOVEL PROCESS OF CHROMO-PHOTOGRAPHY.

M. VALENTIN VAUCAMPS, of Paris, describes the following process of making photographs in colours. We heard a somewhat similar process described before a London Society some years ago. We may say we are somewhat sceptical of the practicability of M. Vaucamps' method:—

The colours of objects photographed make an impression upon the sensitised plate or film of the photographic negative each after its manner and in a different fashion. It is the same with lighted or obscure parts. They create, in the negative, differences of transparency of the sensitised layer in a perfectly defined order extending from the indigo of the solar spectrum to red.

From this it follows that the transparent parts, and the lighest half-tints, of the negative correspond inversely to the obscure parts or to the dark half-tints of the object photographed, and that, for coloured parts as well in their complete totality as in their half-tints, the darkest parts of the negative correspond to the actions of the coloured rays upon the sensitised layer, that is to say, they gradually increase in intensity from the red to the indigo of the spectrum.

Accordingly it may be said that, when once the negative is obtained, the variations in transparency which it presents are in the order of the tonalities and of the colours of which it has received the impression. If, then, I reproduce upon the picture, obtained with this negative and in suitable order, the causes which have determined upon the negative the action of the object photographed, this will be the object itself which is reproduced upon the picture.

I have thereinbefore stated that the differences in transparency of the

negative follow an order extending from the indigo of the solar spectrum to red; it is, therefore, with a view to this order that the sensitive layer of the picture has to be constituted.

The following is the manner in which I effect this object:—

In order that the explanation of my process may be rendered easier, I will suppose that it is desired to reproduce an object presenting three colourations only, that is to say, blue, yellow and red.

The negative made from this object will present different degrees of transparency, in the order of the colours. Thus it will be very transparent in the parts corresponding to red, dark in those corresponding to yellow, and still darker in those corresponding to blue; therefore it shows differences of opacity corresponding to the colours of which it has received the impression.

For reproducing these differences upon the picture and translating them into colourations similar to those of the object, I proceed in the following manner:—

Upon an appropriate surface I spread a first layer, which is sensible or sensitised, or which will be sensitised later on prior to the exposure to the light, which I have coloured red beforehand. Upon this layer I spread a second yellow colour, and then upon this a third blue colour.

If I expose the surface thus prepared to the action of the light under the corresponding negative, I obtain an impression of the sensitive layer, which is very strong for the most transparent part of the negative (that corresponding to red), and which will thence continually lessen, passing through the part corresponding to yellow to the part corresponding to blue.

The following will take place at the time of the development, for example, of a picture with mucilage bichromated in lukewarm water after transfer and after removal of the paper which supported it before this transfer.

As, in consequence of the said transfer the red is at the surface, the parts of the layer which enclose it, and which have been reached by the light, are insoluble; the others will be dissolved, and will lay bare the layers enclosing the yellow colourations, whose parts reached by the light will be insoluble, and the others not reached will be dissolved, allowing to appear the parts of the blue layer reached by the light, and whose parts not reached by the light will be dissolved in their turn, and allowed to appear the support if there are white parts in the object photographed.

Accordingly the picture will reproduce in an identical order the colourations of the photographed object, which have made an impression upon the negative.

From the foregoing it will be seen that the means which I use for reproducing the colourations of the object photographed consist in covering a suitable surface with successive sensitive or sensitised layers or layers, which are subsequently sensitised prior to the exposure to the light, in which I incorporate beforehand colours in such a manner that the whole of these successive layers, which constitute the material of which the picture is formed, corresponds to the more or less transparent parts, which in the negative is determined by the exposure of the latter in the dark chamber in the presence of the subject to be photographed.

The picture, being thus constituted of successive sensitive or sensitised layers, diversely coloured, is then exposed under the negative in the ordinary manner. When the exposure has taken place, the various layers of the picture have received an impression according to the nature of the negative, and it is sufficient to develop the picture as hereinbefore specified for laying bare the coloured surfaces or the parts of these surfaces so that the negative encloses them in the state of more or less transparent tints.

It will be understood that with my process, by multiplying the number of layers of the pictures, so as to introduce into the same the scale of the colours with their half-tints, I succeed in producing coloured images reproducing subjects with the most diverse colourations, and with any degree of intensity of their colourations.

In lieu of the order of the colours hereinbefore stated, I may also invert this order to obtain optional or imaginary effects.

It will scarcely be needful for me to add that any colours and any colouring materials which may be incorporated in the sensitive or sensitised layers, or such as may be sensitised, of which I form my pictures, are suitable for my process without any need for specifying them otherwise.

The same is the case with materials which are sensitive themselves, or which must be sensitised, which I arrange one above the other in order to form my pictures. These materials may be any one of those heretofore used in photography, and I may employ them either together or separately, in order to form layers of the same composition, or of different composition, upon the same picture, so as to modify, according to the requirements of the photographed subject, the effects of the sensitiveness during the exposure.

Lastly, I may constitute my pictures either in the state of plates, or in the state of papers, or in the state of films.

In the case of films, I may colour them either by preserving their transparency, or by rendering them semi-transparent, by the incorporation of a white colour, or of any colours or tints, to form a ground at the same time as a support for one or more of the coloured layers hereinbe ore described.

For the manufacture of my plates, films, or papers, I may proceed by letting a layer dry before pouring another on the top, when use is made of one of the sensitive materials or materials, which must be sensitised as hereinbefore mentioned, including gelatine. However, in the case of this latter body, I prefer to allow the first deposited layer to set by lowering, if necessary, its temperature by artificial means; I then pour upon the first layer thus set and cooled, but not yet dried, the second layer, the mixture of which has previously been melted in a water bath at a temperature of + 45° or 55°, then brough to + 30° or 40°, prior to the pouring on, and so forth to the last layer. By this means the gelatinous mixture ready to be poured on possesses a sufficient degree of heat for remaining fluid, without, however, being hot enough for melting the humid and set layer upon which it has to be spread. I vary, moreover, the temperature according to the quantity of gelatine contained in the mixture, the quality of the gelatine, and the ambient temperature at the moment of the pouring on.

This mode of procedure imparts to the different layers a great adhesion between each other; they are no longer susceptible of splitting up in the dry state or in the development, which often occurs with layers placed in the fluid state upon layers which are already dry.

The picture hereinbefore referred to must be regarded by reflection, for by transparency the effect is no longer the same, by reason of the superposition of the coloured layers existing below those which the development has rendered visible by reflection. With the aid of a simple manipulation, I may, however, render the same pictures visible by transparency or by reflection.

In this case I effect the development upon paper coated with collodion or indiarubber, and I transfer the picture upon a very plane glass plate. The reliefs which the development has caused at the surface of the picture being forced to the rear, in contact with the plane of the glass plate, reappear naturally at the back of the picture; but it should be observed that these reliefs contain coloured layers, which remain without effect in the result obtained, because they are masked by those which the development has alone laid bare. If I remove what may take place in the dry or in the moist state, with the aid of a grindstone or any other means, these layers, which now form projections at the back of the picture, there will adhere to the glass plate only the layers or the parts of coloured layers which contribute to the formation of the picture, and the latter will then be visible as well by transparency as by reflection.

The presence of reliefs at the surface of the pictures or the photographic negatives may also be utilised in another manner for the mechanical reproduction of a greater or smaller number of copies of the said negatives or pictures.

For this purpose I proceed in principle as follows:—

I take a negative or a picture obtained by the process as hereinbefore set forth, that is to say, containing the coloured layers which the development has reached to a greater or smaller depth, giving rise to the reliefs on the same.

I place this relief upon the table of a reproducing machine, such as machines for manufacturing musket stocks of certain machines for carving. Around the type picture I arrange plates composed of superposed and coloured layers resembling, as regards sensitiveness, those which I use for my photographic pictures. Over all the parts of the surface of the type I pass a blunt point, which follows all the reliefs, and which, with the aid of levers connected with it, transmits all its movements to tools which scoop out the surface of the plates. It is easy to understand that by this means the tools will scoop the surfaces of the coloured coats of the plates, and that, if the superposed layers of these coats are equal in thickness to the layers of the type, the same indentations of the surfaces reach the same depths, the tools lay bare at the same places the corresponding layers with colouration. Thus I obtain in this manner, and owing to the principle of the superposition of the coloured layers, which forms the basis of my invention, pictures which reproduce faithfully the type which serves as a model.

A PROTEID PRINTING PROCESS.

This process is the invention of Dr. Max Jolles and Dr. Leon Lilienfeld, of Vienna, who remark that, in contradistinction to the albumens, gelatines, &c., heretofore employed, it has been discovered that proteids in which phosphorus is present can be successfully used. Proteids containing phosphorus, known by the various names of nucleo-proteids, nucleo-albumens, nucleo-globulins, nucleins, paranucleo-albumens, paranucleo-proteids, paranucleo-globulins, para-nucleins, &c., are such proteids containing phosphorus in organic combination. The nucleo-proteids, &c., contain the phosphorus in the form of nucleic acid, an organic acid containing phosphorus which is combined with egg albumen, and gives as products, on splitting up, the so-called alloxur or xanthine bases, guanine, xanthine, adenine, hypo-xanthine, &c., whilst the paranucleo-proteids, &c., do not give the said alloxur or xanthine bases on splitting up.

To the nucleo-proteids belong, for example, the nucleo-albumens, nucleo-histons, nucleins, &c., obtained from animal and vegetable material. To the paranucleo-proteids belong, for example, vitellne, ichthuline, casein, legumin, &c.

A suitable proteid or a mixture of several is dissolved in an alkali, alkaline earth, or a salt thereof capable of dissolving the proteid or the

mixture of proteids selected, either in the warm or cold state, and the concentration of the proteid solution is brought to the required degree to suit the brilliancy and thickness desired for the time being. For ordinary purposes a 10–12 per cent. solution of the proteids in a 3–6 per cent. solution of the salts will be found suitable. The addition of a small quantity of alcohol is advantageous under some circumstances. The proteid employed can also be tanned with a solution of formic aldehyde, tannic acid, alum, &c. The solution so prepared is salted in the ordinary way with a haloid, and either mechanically or manually coloured or left uncoloured, filtered through paper, flannel, leather, hemp, or the like, or by known methods in either a hot, warm, or cold state as desired, or applied to a suitable paper in its original condition. For this purpose either fine paper, free from woody fibres, or paper provided with a layer of chalk, baryta, or, in general, any other paper suitable for photographic purposes, can be employed. The proteids containing phosphorus can also be used either alone or mixed together, or even in combination with other substances in order to apply them, with a salt of an alkaline earth (barium, calcium, &c.), to the desired papers, to serve as a foundation layer, on which a suitable coating is applied, this coating being already sensitised or adapted to be subsequently sensitised.

The paper can be used satined or unsatined. The paper finally can receive single or multiple coats of the proteid solution selected.

The proteids give, with halogen-silver salts, with correctly chosen concentrations of the proteid and silver solution and correct proportions of added salts, emulsions which, when applied to paper, give a highly sensitive, durable, and brilliant copying or printing paper.

The improved proteids can, if desired, be used with albumen, gelatine, celloidin, collodion, or other known materials suitable for the purpose.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

"Of the making of many books there is no end," said the wise man, and we may surely apply the words to the making of the many societies which are continually springing up around us. Indeed, we might continue the quotation, and hint that they are "a weariness of the flesh." This, of course, cannot apply to all societies, for some of them are doing splendid work, others are of indifferent character, and the rest are positively mischievous in their effect upon suffering humanity.

We must all admit that the society which has been formed to collect photographs of notable places and things, archæological and historical, and to deposit the same for the edification of posterity in the British Museum, is worthy of support, and we have no hesitation in commending it to the kind consideration of photographers generally. This useful Association is under the presidency of Sir Benjamin Stone, M.P., and it is good to know that he is no mere non-entity, placed at the head of a society for ornamental purposes, like the figure-head of a ship, but that he is himself a clever photographer and one who finds his hobby in picturing relics of the past. Thus we find in Sir Benjamin the right man in the right place—a happy circumstance, which perhaps would not have been known beyond his immediate circle if he had not addressed the Camera Club last week on the subject dear to his heart, and illustrated his remarks copiously by a display of pictures of great merit in themselves.

The audience was not perhaps as large as could be wished, for Thursday night was a foggy one; moreover, the stay-aways could not know by the title of the lecture what a treat they would miss by stopping at home. This title was, *The National Photographic Record Association*, and we must admit that it breathes of dry-as-dust matter. But the lecture itself proved to be anything but dry, for instead of dealing with dreary statistics and dwelling upon official details, Sir Benjamin left the Society to take care of itself, and showed a series of pictures to illustrate its aims. The Society was, for the moment, forgotten, and photographers were shown how they could take up a most interesting section of work in making pictorial records of all kinds of objects of interest.

The audience had a foretaste of this in the fine collection of pictures hung round the club room, a collection which, by the time these words appear in print, will be much augmented. These pictures comprised studies of archæological remains, relics of old English customs, and architectural monuments, and many of them were the work of the lecturer, who, it is evident, has devoted many years to their accumulation. There were here materials for many discourses, but Sir Benjamin quickly showed that he did not rely upon these pictures for his subject-matter, which was illustrated by an independent set of lantern slides.

Sir Benjamin, at the outset, stated that he had no intention of treating his audience to an exhaustive essay, he wanted rather to enlist their sympathies on behalf of the new Society, and to secure the allegiance of those photographers who have time on their hands and who generally work with the camera with no very definite object in view. Those who occupied their energies in making snap-shots at everything, from a balloon to a barge, would find that it would repay them a thousandfold, as a mere matter of interest, to devote more attention to such pictures as would be valuable to the future compiler of history. He begged leave to give a few instances of the direction in which such attempts should tend.

It would not strike most people that country churchyards were likely to afford any materials to help the archæologist in wedding the present with the past, but he had found it a matter of great interest to trace in the shape of old tombstones the influence of the ancient cromlech form. A cromlech was in itself a rude monument although we could not say why it was raised, for it bore no inscription; it consisted of a huge slab of stone supported by three or more upright masses of the same material. We found precisely the same structural features in many a churchyard, a flat dressed stone supported at each corner by a smaller mass. This gradually grew into the brick, or stone box tomb, and we could see the same idea carried out in far more elaborate fashion in that beautiful tomb in Westminster Abbey in which the slab was supported at each corner by a kneeling knight.

Then again, much could be learnt by studying the inscriptions or markings on ancient monuments. The earliest of these were simple monoliths without any marks at all. Next in order came the runic inscriptions of Norway, Sweden, &c., and later on these were elaborated by a line enclosing the inscription and a serpent's head and tail. From the sixth century onward this design—which was, of course, a relic of serpent worship—became elaborated into a double serpent, and modified in various ways. Photographic records which showed the gradual growth of what might be called the serpent idea were most valuable.

There was another reason why photographs of ancient objects were of extreme value to the students, they permitted us to compare objects which themselves are widely distributed, and which cannot, by any possibility, be brought together. For example, he had been examining some ancient temples in Malta, which were, in many respects, the first examples of ancient work which he had ever seen; and, strangely enough, the way in which the stones were laid found their counterparts in our own Stonehenge. Why this should be so he was unable to say; but the photographs which he would presently throw upon the screen made the fact evident enough. The same motive, whether a religious one or not, had inspired the builder in each case. And he would also refer to the ruins at Baalbec for evidence of the same fundamental idea which had influenced the builders there. It was a matter for wonder how these immense masses of stone were reared into position with the mechanical power then available. In a quarry two miles away from Baalbec there was a monolith ready for removal, which for some reason or other had remained *in situ*. The photograph which he exhibited gave a good idea of its enormous size, for the men standing upon it looked very small indeed. Its height, as it lay on its side, was thirteen feet by thirteen feet broad, and its length was twenty-two *yards*—the length of a cricket pitch. The weight of this huge monolith was no less than 1100 tons, and other stones like it had been conveyed to Baalbec, two miles away, and built into the walls of the beautiful temple which to-day was a ruin.

But we need not go so far afield to find curious instances of the same kind of structure; there were still extant in Ireland beehive dwellings—of one of which he showed a photograph—in which the stones were laid in the same fashion, as well as inclined doorways exhibiting a similarity. Speaking of Ireland, it was curious to observe that stones there were still to be seen with a curious hole bored through them. In modern times the peasants would put their newly born babies through this hole in order to make them lucky throughout life. Similar holes were shown in monumental stones in that old Egyptian papyrus known as *The Book of the Dead*, which was preserved at the British Museum. It was supposed that this orifice was meant for the spirit to take its flight from the mortal remains left in the tomb.

Sir Benjamin next dealt with matters closer to our own times, and intimately associated with English history. He had obtained permission to explore and take photographs in the Pyx Chapel at Westminster, and the pictures which he had obtained were thrown upon the screen. This chapel at one time contained the Crown jewels, and had always been jealously guarded, but the only valuables it now contains are the little bars of gold and silver which serve as standards for the coinage. Every year, at "the trial of the Pyx," these standard bars are conveyed to Goldsmiths' Hall; a little piece is chipped from each, and subjected, together with coins of the new issue, to careful assay. This custom is a relic of those far-off times when kings found it occasionally convenient to alloy their coins with something more than the usual ten per cent. of copper. It need hardly be said that, in these more honest days, the coins always come out bravely from the test, and that the proceedings wind up with a good dinner.

Also in the Pyx Chapel are found several wonderful old chests dating from the time of Edward I., including the treasure chest which invariably accompanied an army to hold "the sinews of war." Another chest was devoted to "tallies," the sticks of wood which, notched and split apart, served as receipts for exchequer payments, the payer holding one half, and the government retaining the other. Should any dispute arise as to the circumstance of payment, the two halves could be put together again, and if they "tallied" the payer was exonerated. Many other quaint old customs were lightly touched upon and fully illustrated by means of lantern slides.

Sir Benjamin Stone, as a member of the House, has had unusual facilities for taking photographs both inside and outside the Palace at Westminster, and he has made good use of his opportunities. His pictures include views on the terrace, and from the summit of the clock tower, and various pictures of the interior of both Commons and Lords' dining-rooms, smoking-rooms, &c. He also showed a very fine collection of impromptu portraits—which may thus be described because Sir

Benjamin set up his camera in front of a suitable dark doorway which made a good frame for his pictures, and persuaded such members of the House who happened to pass that way to stop for a moment and become his models. In this way he managed to secure first-rate portraits of Mr. Chamberlain, the late Mr. Mundella, the Chaplain of the House, Canon Wilberforce, and many others. These pictures formed an interesting concluding series to a lecture which bristled with information.

Lord Crawford, who was the Chairman of the evening, summed up the proceedings in terms very complimentary to the lecturer, and the proceedings closed with the usual vote of thanks.

THE EASTMAN EXHIBITION.

In our last number we were only able to refer with comparative brevity to the salient features of the Eastman Exhibition at the New Gallery, but a second visit has given us the opportunity of adding to our original impressions, and we here take occasion to record them. It must certainly be satisfactory to the Company to realise that, aside of its commercial value and interest, the purely technical and artistic aspects of this remarkable Exhibition have been so generously recognised far and wide—indeed, we go the length of saying that both branches of photography will be favourably influenced in the future by the excellent work here shown.

The Invitation, or Artistic Section, is clearly a one-man show of an unconventional kind, for it betrays the master hand of the gentleman who was more immediately concerned in its organization. Observe that the enlargements here shown, to the number of nearly 200, are by the Eastman Company from negatives lent for the purpose. It is no exaggeration to say that there is scarcely a photograph hung in the room which does not take high pictorial rank, and yet we are loth to think that several producers of the negatives, if left to their own devices, would have turned out finished results in any way comparable to the pictures that have been produced.

We do not think that this section of the Exhibition falls within the sphere of ordinary newspaper criticism, or that any useful office would be served by subjecting the photographs shown to individual reference. Two or three dominant features of the room must suffice as the foundation of our remarks. Mr. George Davison adds to the many other pleasant surprises he has sprung upon us here by the portrait studies that he shows. We are half inclined to fancy that "G. D." has purposely kept his powers in this direction "up his sleeve" all along. He has several portrait and figure subjects, two of which, *Child Portrait* (a little girl with skirts slightly distended), and the portrait of a *Lady in White*, are as graceful as they are unconventional in effect. Mr. Craig Annan is also strong in portraiture, and the work he shows is immensely ahead of his Salon exhibits, particularly the charming study of a bonny little girl, *Agnes Reid Warnoch*, deservedly hung in the place of honour. Convention visitors will recall the scene of Mr. George Tottem's *Oulton Broad*, a splendid view of the water covered with racing craft. *Fashion* is the name given to one of Mr. Dickman's exhibits, and the title is happily chosen. It is an impressionistic view, so to speak, of a lady dressed in up-to-date garb, as she passes on her way in some such fashionable resort as Hyde Park or the Bois de Boulogne. Mr. Robinson contributes two or three large photographs in his bright and incisive style of long ago—*Wayside Gossip*, *Maiden Meditation*, and *Gathering Bracken*—which supply a not unwelcome note of relief to the wall on which they are hung. More or less familiar works by Mrs. Francis Clarke, F. H. Evans, Alfieri, and A. R. Dresser will attract the notice of habitual Exhibition-goers, and popular interest will be excited by the enlargements of the negatives made by the Royal Princesses, among whom the Duchess of York appears to exhibit considerable powers of artistic selection.

The competitive photographs, numbering many thousands and occupying a room by themselves, furnish a strong argument in favour of the use of small apparatus, as among the work, both small and large, one discerns a mass of very good photography. But we imagine that our professional readers will be chiefly attracted to the Technical Room, for in this apartment the exhibits supply several very valuable object-lessons. The influence of the composition of the toning bath upon the colour of the image in gelatine is a subject of great importance to photographers, and here, by the aid of several specimens, it is illustrated for all to see and study. Here, too, one is shown the variety of colours obtainable by development of bromide paper by the use of different developers, while a complete series of examples of the colour effects produced by various methods of toning bromides is included. X-ray and paper negative work are matters of current interest, and one is enabled to contemplate the best results producible in both branches of photography. In the lantern slide tunnel the visitor gets, as it were, the opportunity of making an objective study of negative and positive work.

The Exhibition remains open for several days longer, and we recommend all those who can do so to pay it a visit. It is impossible to leave it without bringing away with one many a useful lesson in practical photography; and the language at our command does not permit us to pay a higher or better-deserved compliment to the Eastman Exhibition.

BRIXTON AND CLAPHAM CAMERA CLUB.

The Seventh Annual Exhibition of this Club was opened at the Clarence Rooms, on Monday night. Breaking away from their usual custom of having an open class, this year they have formed an invitation section, and a fine show of good but well-known pictures are on view, by Messrs. H. P. Robinson, Craig Annan, Burchett, Alfieri, Harold Baker, W. Crooke, Davison, Greger, and Sinclair.

In Class A, which was for members, the quality of the work is distinctly higher than last year, and, for the best collective exhibit, Mr. J. Gunston takes the silver medal, and Mr. F. W. Levett the bronze. For the best individual print Mr. E. Dockree took the silver medal, and Mr. F. P. Smith the bronze. Class B was reserved for beginners who had started photography since 1895, and Mr. H. Redman carried off the palm.

The lantern slides last year were of such poor quality that the Judges withheld the award; but this year we hear that the Judges—who were Colonel Gale, Mr. F. P. Cembrano, and Mr. E. J. Wall—expressed great satisfaction at the improvement in the quality, and awarded the silver medal to Mr. J. Gunston, and the bronze to Mr. R. Fisher, jun. In the Beginners' Slide Class there were only two competitors, and no award was made.

Our Editorial Table.

Photopake.

The Vanguard Manufacturing Company, Maidenhead.

Samples of this useful addition to the resources of the photographer have been sent us. Photopake is apparently a viscid solution of a dark red pigment that may be applied to many uses in the production of negatives and lantern transparencies. Respecting the former, it is applicable to spotting out pinholes, blocking out backgrounds, and the various other purposes that will suggest themselves; while for lantern slide work its uses are equally obvious. It dries quickly, gives a smooth, even surface, and is quite opaque. Photopake is handy to have in the photographic work-room.

Ortol-Hauff.

Fuerst Brothers, 17, Philpot-lane, E.C.

We have received for trial a quantity of a new developer, Ortol, which we shall put into use and report on so soon as our Almanac labours are over. In the mean time we append the official instructions for its use, with the remark that its power of being easily restrained is one that gives it considerable practical value:—

Solution A.

Water	10 ounces.
Metabisulphite of potash	35 grains.
Ortol	75 „

Solution B.

Water	10 ounces.
Sodium sulphite (crystals)	1¾ „
Carbonate of soda (crystals)	1¾ „

For studio portraiture, &c., take 1 part A, 1 part B; for landscape negatives, take 1 part A, 1 part B, 1 part water. In the summer time add to 1 part B 4 to 8 drops of ten per cent. bromide solution, or use 5 to 10 grains bromide of potassium (crystals) in 10 ounces solution B.

The principal advantage of Ortol is in its capability of being restrained with bromide of potassium, which latter does not have much effect on metol, amidol, &c. With Ortol a few drops of restrainer will defer the appearance of the image, thus making it easy to watch development.

The image appears slowly within about twenty seconds, and is generally completely developed in about four to five minutes. Ortol works cleanly, and gives good density. After the developer has been used, if it is kept in well-closed bottles, it may be used repeatedly.

News and Notes.

Photographic Club.—Wednesday evening, November 10, at eight o'clock, Members' Open Night. Slides, &c., *My Holiday Trip*, Mr. Charles Wallis.

In future Mr. C. H. Bothamley's address will be Otterwood, Beaconsfield-road, Weston-super-Mare, instead of Wentworth, Weston-super-Mare, as heretofore.

Manchester Amateur Photographic Society.—The Twelfth Annual Photographic Exhibition will be held at the Manchester Athenæum (George-street entrance), on Tuesday, Wednesday, Thursday, Friday, Friday, and Saturday, November 9, 10, 11, 12, and 13, 1897.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, November 9, at the Gallery, 5A, Pall Mall East, at eight p.m. *The Spectroscope*, by E. W. Maunder, F.R.A.S.

WE are sorry to learn of the death of Mr. T. P. Watson, formerly of the firm of W. Watson & Sons, 313, High Holborn, W.C. The deceased gentleman was in his forty-third year.

THE work of restoring Maclise's two celebrated frescoes, *Wellington and Blucher at Waterloo* and *The Death of Nelson*, in the Royal Gallery of the Palace of Westminster, upon which Professor A. H. Church, F.R.S., and his assistants, have been engaged for some time past, will be completed this week, the result of the special treatment, so far as can be at present ascertained, being of the most satisfactory character.

AINTREE PHOTOGRAPHIC SOCIETY. — The Exhibition Secretary, Mr. Darley Travis, St. John's-road, Fazakerley, Liverpool, writes: "Owing to sundry applications received, it has been decided to open another class for amateurs—Class N, Figure Studies and Portraiture; set of three prints, for amateurs only. Competitors in the new class will kindly fill in particulars on the professional entry form, substituting N for M, and portraiture for professional. Entries close November 27, pictures to be sent by December 4; Exhibition, December 9, 10, and 11.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
8.....	Bradford Photo. Society	*A Survey of Yorkshire.* Godfrey Bingley.
8.....	Ealing	Lantern Evening.
8.....	North Middlesex	*Light and Colour.* J. S. Churchward.
8.....	Richmond	*A Chat about Lenses.* Rev. F. C. Lambert, M.A.
9.....	Birmingham Photo. Society ..	*Notes on the Gum-bichromate Process as Applied to Pictorial Photography.* Fred Coop.
9.....	Hackney	Lantern-slide Making.
9–13 ...	Manchester Amateur	Exhibition of Members' Work.
9.....	Royal Photographic Society ...	*The Spectroscope.* E. W. Maunder, F.R.A.S.
9.....	Wolverhampton	*Camera, Apparatus, and Exposure.* H. Holcroft, M.A.
10.....	Borough Polytechnic	*Pictorial Photography.* A. Horsley Hinton.
10.....	Croydon Camera Club	Public Lantern Show: *Wild Birds at Home.* Reginald B. Lodge.—Jubilee Slides by Members.
10.....	Kingston-on-Thames	*A Chat about Lenses.* Rev. F. C. Lambert, M.A.
10.....	Leeds Camera Club	*Light.* E. R. Dixon.
10.....	Leicester and Leicestershire ...	*The Chemistry of Photographic Materials.* L. Ough.—*Some Practical Photographic Dodges.* C. M. Hepworth.—*A Trip on a Norfolk River.* Fifty-five Slides lent by the Great Eastern Railway Company.
10.....	Leytonstone	*Photographic Advances of the last few Years.* T. C. Hepworth, F.C.S.
10.....	Photographic Club	*My Holiday Trip.* Charles Wallis.
10.....	Polytechnic	*Lantern-slide Making.* G. Goose.
10.....	Southport	*Cloud Photographing.* A. Horsley Hinton.
11.....	Darwen	Demonstration: *McKellen's Infallible Hand Camera.* Mr. McKellen.
11.....	Liverpool Amateur	Lantern in Use.
11.....	London and Provincial	A Paper by A. Haddon.
11.....	Woolwich Photo. Society	Prize Slides.
12.....	Borough Polytechnic	*Bromide Enlarging.* P. C. Cornford.
12.....	Croydon Microscopical	Selection of Photographs and Slides for *Soirée.*
12.....	Wakefield	*Photo Aquatint.* Dr. Clarke.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 2,—Special General Meeting,—the Earl of Crawford, K.T., F.R.S., in the chair.

THE NEW RULES.

The PRESIDENT explained that the meeting had been specially convened, in accordance with the provisions of the Companies Acts under which the Society is incoporated, for the adoption or rejection of new Articles of Association, which had been drawn up by the Council pursuant to a resolution passed at a meeting held in December, 1895. That resolution referred only to the election of members of the Council, the object of the proposed alteration being to insure the inclusion of "new blood" in that body; but it had been found desirable to make certain other minor modifications, and a complete code of new Articles of Association was therefore submitted for consideration. He proposed to conduct the meeting in Parliamentary fashion, taking a "first reading" to bring the new rules formally before the meeting, a "second reading" to affirm the necessity of some alteration, and a "third reading" at which each paragraph might be discussed *seriatim*, and amended if thought desirable.

The new rules, or Articles of Association, as they are legally called, numbered seventy-two, with the addition of a schedule, and, after the first and second "readings" had been carried, the first twenty-eight paragraphs were adopted without dissent, the first manifestation of opposition being with regard to Article 29, the final words of which dealt with the election of

FELLOWS AS MEMBERS OF COUNCIL,

and read, "At least one-half of those elected on the Council shall be Fellows of the Society." The adoption of the rule having been moved,

Mr. W. E. DEBENHAM moved, as an amendment, the deletion of the word quoted above, on the ground that they would limit the freedom of choice o the members of the Society, and that it might happen that a Fellow wa elected on the Council by a much smaller number of votes than was receive by a member who was not elected.

Sir H. TRUEMAN WOOD and Mr. T. BOLAS supported the amendment, whic was opposed by

Mr. H. SANDLAND, a Fellow, who pointed out that the rule as proposed pro vided for the equal representation on the Council of the general body o Fellows and members.

The amendment was lost, fifteen voting in its favour and nineteen against it and the rule in its original form was adopted, as were also Articles 30 to 3 inclusive, defining the powers and duties of the Council. Articles 36 to 41 inclusive, dealt with the election of officers, and it was with regard to thes that interest was keenest, and that the strongest opinions were held. Th consideration of No. 36 was temporarily deferred, as its wording depended t some extent upon the final form of the succeeding paragraphs.

NOMINEES AND NOMINATORS.

CAPTAIN ABNEY moved, as an amendment, the rejection of Article 37, which dealing with the election of Council and officers, provided that "a ballotin paper, *containing no names but those of the members nominated and eligible t serve*," should be sent to each member, his objection being to the omissio from the balloting paper of the names of the nominators. The proposed rul would work very well so far as London members were concerned, but th Society was the "Royal Photographic Society" not of London alone, bu "of Great Britain," and country members, who were not in touch wit London circles, could not know anything of the fitness of Messrs. Brown Jones, and Robinson who were nominated, and were obliged to judge th merits of the nominees by the names of the nominators, who might be me they knew, or with whose known views and policy they agreed. If th country member were left without this guidance, one of two things mus happen, either he would not vote at all, or he would send his paper to be filled u by some London member, which was not by any means an unheard-of thing a the present time. Again, if a man had any influence for good in the photo graphic world, why should not that influence be utilised in the organization o a good Council? Captain Abney said he had never nominated anybody, an therefore spoke entirely without bias, but he felt strongly that it was legiti mate and right that country members should have some guidance in th election, and that the best means of affording such guidance was to state upo the voting paper the names of the nominators as well as of the nominees.

Sir H. TRUEMAN WOOD seconded the amendment, which was supported b Messrs. Bolas, Pringle, John Stuart, Sandland, Dallmeyer, Chapman Jones Bothamley, and others, and opposed by Messrs. Snowden Ward and E. J Wall, and ultimately carried; whereupon

Captain ABNEY moved that Article 37, as originally drawn, be amended t read "a balloting paper containing no names but those of the members nomi nated and eligible to serve, *and their nominators*," and adopted as so amende The motion was carried.

THE "NEW BLOOD" RULE.

Article 39 provided that "of those elected as Vice-Presidents and ordinar members of Council, at least five shall not have served in either capacit within the preceding year, any retirement rendered necessary being b seniority of service, and, in cases of equal seniority, by lot;" and

Captain ABNEY moved its rejection. He considered it altogether unjust t the Council, and contrary to the best interests of the Society, to place any of it members under a disability, and to tell a man that, because he had serve faithfully on the Council for five or six years, he had served so long that h was unfit to serve any longer. The fact of the matter was that certai members thought that some old and faithful members of the Council—"the ol ruck," as they had been called—should be got rid of, and this rule was intende to effect that purpose. None of "the old ruck," however, were now on th Council, for death and retirement had removed them. The cry about "ne blood" was absurd, and the provision at the end of the article for a game o "pitch and toss" was perfectly lovely; indeed, he expected to see a cartoon i *Punch*, representing the junior members of the Society playing "pitch an toss" for seats on the Council.

Mr. DEBENHAM seconded, and Mr. PRINGLE said that further consideratio had led him to abandon the view he formerly held upon this subject, and t agree with the opinions expressed by Captain Abney.

Mr. BOLAS "pointed a moral" by recounting the disastrous experiences o the Government of Venice, where a law was enacted some 150 years ag having a similar effect to that of the proposed new rule.

After prolonged discussion the rule was rejected the voting being—fo Captain Abney's amendment, 20; on the contrary, 19.

Some consequential amendments were made in Article 36, and the remainin paragraphs were adopted with some slight verbal alterations, Mr. DEBENHA unsuccessfully attempting to secure the deletion from Article 54 (relating t the Exhibition) of the words, "If awards be given, the Judges shall be electe by the members of the Society." It was arranged that the statutory meetin for the confirmation of the new rules should take place on November 2 instant.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 28,—Mr. A. Haddon in the chair.

Mr. S. HERBERT FRY explained that, at the invitation of Mr. Freshwate he had undertaken to make a few contact prints from a negative supplied b that gentleman, and to communicate a few notes upon the subject to th Association. Like many other promises made with the best intention although he had made the prints, and would pass them round, the promise wa not realised in the second particular, and so he had come in person to offer few remarks. He understood that there was recently some discussion upo the relative values of printing processes, in continuation of which he woul show one or two prints on bromide paper in addition to some experiment

nes, to show the large range of alteration that can be made in the results in ıe use of the bromide printing process. At the same time he did not wish to e thought a particularly strong advocate of the process mentioned, but it did ɜem to him that it lent itself most of any to modification of result. Pro-ably for this reason the photographer resorts to bromide printing in the case f bad negatives as being the most likely process to improve the result; and, rguing from the particular to the general, that was why, in some people's yes, bromide was a bad process. For the purpose of comparison a number f prints were passed round. They included one on printing-out paper, one n platinum, and four purporting to be fair commercial bromide prints, with ıothing special about them at all. Of these one was on the smooth paper, nd another on rough paper. He remarked, parenthetically, that it was xtremely difficult to find any two makers of bromide papers nowadays who ıttached the same meaning to these terms of classification. The smooth of one naker compared with that of another was often comparatively rough, while papers vhich might be equally smooth differed entirely in texture, varying with each ɔatch or issue of the paper. To come back to the subject, the third and ourth prints were respectively on the glossy-surface paper known by various ɔommercial names, the emulsion being coated on a baryta surface, and on the ɔo-called platino-bromide paper. In these four examples any difference was lue to the essential characteristics of the paper. To illustrate the further lifferences that can be effected in bromide printing by modifying the several 'actors of development, exposure, distance, &c., he passed round four prints rom the one negative, in which could be seen a very extended range from nfinitely more brilliancy than would be appreciated, down to extreme flatness, nd between these two extremes anything could be obtained. He had hoped ɔo have shown carbon prints in which, as far as could be done, similar nodifications had been made, but would have to promise these for a future ɔccasion.

The CHAIRMAN took up the subject from the standpoint of subsequent treat-ment by chemical alteration of colour, to which bromide, as distinct from any ɔther process, lent itself very readily.

Mr. FRY considered this the worst possible use to which a bromide print could be put, and any attempt to modify the colour except by pure develop-ment made the process absolutely uncommercial. The simplest way of altering the colour was to bleach the print with bichromate and a little acid, and then to place in the light. The colour could be modified by redevelopment, or it could be left as it was. This was far more certain than uranium toning, or any of the usual methods of altering the colour. He had had a print treated in this way for six years, yet no sign of deterioration was visible. In reply to a remark as to the possibility of fixing at the desired stage of rede-velopment, Mr. Fry observed that, having in this manner produced apparently a warm-coloured image by development it would be found that fixing would dispel all traces of warmth, leaving the image of a cold colour. He proceeded to add that considerable variation in colour in the direction of browns could ɓe obtained with the use of hydroquinone and pyro, and that he should not choose these for normally coloured prints.

Mr. W. D. WELFORD said there was no paper in existence with which so much could be done as bromide paper allowed of. As regards colour, he repeated that, with fifty times the normal exposure, and a hydroquinone developer restrained about twenty-five times, bromide paper would give a print of a scarlet colour, and he had one so made fifteen years ago.

Mr. EVERITT suggested that, but for its dependence upon climatic con-ditions, carbon printing would give a severe beating to bromide printing.

Mr. FRY thought the carbon process was one with which the average photographer succeeded the least. It required a negative suitable foritself.

Mr. EVERITT, however, gave the process the character of being able to give a good print from a thin negative, provided the tissue was properly sensitised.

Mr. FRY believed a carbon printer would prefer to reproduce his negative than to make what he could by manipulating his process. With bromide printing the manipulations were easy to control, it being a matter of indif-ference whether one doubled this or that ingredient or the exposure, but with carbon, at the outset, one had to sensitise the tissue specially for the particular negative used to ensure the result. However, it was not his object to sing the praises of bromide paper, but rather to show what one process could do.

The platinum and the platino-bromide prints were together passed round with a view to eliciting the opinion of the meeting as to which gave the best result. Several spoke to the effect that it was difficult to distinguish between them, and opinion was equally divided.

Mr. FRY concluded by saying that, in his mind, it was a question as to which might be taken to reproduce the original negative best, and not to be judged by personal preference. For instance, the bromide might have been made to simulate the platinum more than it did; but, as it was, he thought the bromide must be taken as the best, the gradations being more perfectly reproduced, although pictorially he liked the platinum, which was a little soft and pleasing.

PHOTOGRAPHIC CLUB.

OCTOBER 27,—Mr. E. A. Newall in the chair.

A large gathering of members and friends, including several ladies, thoroughly enjoyed the lantern lecture upon

THE CHÂTEAUX OF FRANCE,

by Mr. J. J. Vezey. The set of slides was most uniformly of high merit, and the racy remarks of the lecturer as to the games and loves of the kings of France, &c., with various bits of ancient history, were much enjoyed.

Ealing Photographic Society.—The following is the report of the Council for the season 1896–97: "Your Council have much pleasure in reporting that the Society is in a very healthy condition. The total number of members now on the roll is fifty-eight. The balance in the bank is 7*l.* 1*s.* 8d. The change of evening has been satisfactory, the meetings being more fully attended. At an Exhibition held in connexion with the Ealing Technical Science and Art Exhibition in the Public Buildings, a large number of photographs were shown, and the Judge awarded several medals to the work of members. The meetings for the coming season have been arranged, and will, it is hoped, meet with general approval. The popular monthly lantern evenings have been retained. It has been decided to have the enlarging apparatus moved to a more convenient position and thoroughly put in order. This work will be put in hand at once, and it is hoped that the lantern will be again in working order in a few days.

Hackney Photographic Society.—October 26, Mr. E. Puttock presiding.—The Exhibition of the Competition Excursion Prints was postponed to the next meeting, which was also to be used for testing members' lantern slides.

Richmond Camera Club.—For the meeting on Monday, the 25th inst., at which Mr. Cembrano presided, arrangements had been made with the Acetylene Gaslight, Power, and Calcium-Carbide Company, Limited, to give a demonstration of the new illuminant, and there was a strong muster of members and their friends in anticipation of an interesting evening. To the great disappointment, however, of those present, no representative of the firm turned up, nor was any notice or explanation of his non-appearance forth-coming. Under the circumstances the evening was spent chiefly in discussing arrangements for a lantern-slide competition.

Woolwich Photographic Society.—October 28.—One of the Affiliation lectures of the Royal Photographic Society, entitled

INTENSIFICATION AND REDUCTION,

by Mr. J. McIntosh, was read by the HON. SECRETARY (Mr. F. W. Machen), the lecture being illustrated by special lantern slides, thus making it very clear and interesting.

Birmingham Photographic Society.—October 26.—Mr. C. S. BAYNTON gave a paper and practical demonstration upon

LANTERN-SLIDE MAKING.

Treating, firstly, of the subjects suitable for lantern slides and the very important matter of masking, Mr. Baynton showed how unsuitable certain warm tones were for such subjects as architecture. The warm tones, he thought, were more suitable for floral and "effect" slides. The necessity for backing lantern plates was strongly urged, and an illustration showing the great advantage of backing was thrown upon the screen. In exposing lantern slides, Mr. Baynton considered it a good plan to make a trial exposure by making several exposures upon one plate, and upon development the most suitable exposure may be noted. This method is exceedingly useful when a number of slides are to be made. The negatives can be arranged according to their density, and thus the risk of failure is considerably reduced. To say when to stop development was no easy matter, but the lecturer thought the best time was just when the "prettiness" had disappeared, or immediately the high lights became tinted. The temperature of the developer was another important matter, and should be kept as near 60° Fahr. as possible. Methods of introducing clouds into subjects where necessary were treated at length, the best plan being to make the cloud upon the cover glass. Varnishing slides was not advisable, as it was not an easy matter for amateurs to do this successfully. Mr. Baynton then proceeded to demonstrate his methods of making slide by reduction and development by quinol and Harold Baker's developers. A number of very fine slides were shown upon the screen to illus-trate the lecturer's remarks.

Bradford Photographic Society.—The lecture on Monday, October 25 was supplied by Mr. Cowburn, who took as his subject

SOME HINTS ON COPYING.

The speaker treated his subject in a capital manner, giving full particulars as how such-and-such a thing might be done, while some of the hints he dropped were certainly new to most of his hearers. He also showed a framework to be used for the purpose of copying, which might be constructed at small expense, but which would afterwards prove of inestimable value to the user. A vote of thanks was proposed by Mr. Clough, and seconded by Mr. Hewitt. There was, after the lecture, considerable discussion upon the copyright question, in which several members joined, the argument being that no one had a right to copy a copyright picture, even when the same picture was copied merely for private use.

Liverpool Amateur Photographic Association.—The usual monthly meet-ing was held on Thursday evening, October 28, in the Law Association Rooms, Cook-street, the President (Dr. J. W. Ellis) in the chair.—The feature of the evening was a lecture, by Mr. J. SIRETT BROWN, entitled

A PHOTOGRAPHIC EXPEDITION TO THE CANARIES,

during the course of which a number of lantern slides illustrating the three islands—Grand Canary, Las Palmas, and Teneriffe—were shown. Members and their friends turned up in force to hear Mr. Brown, whose racy account of an enjoyable holiday spent by himself and two other members of the Society in the early spring, kept the audience intensely interested for over an hour and sent them away wishing to hear more.

Newcastle-on-Tyne and Northern Counties Photographic Association.—The Annual Meeting of the Newcastle and Northern Counties' Photo-graphic Association was held, October 26, at the Arts Club, Grainger-street, Newcastle, Mr. W. Parry (President) occupying the chair. Mr. J. R. Wilson, Newcastle, was elected a member of the Association. The Hon. Secretary (Mr. J. Brown) read the sixteenth annual report of the Council, who con-gratulated the members upon an exceedingly prosperous year from a financial standpoint. The membership was 104, as against 113 at the last annual meeting. During the year the roll had been decreased by twenty names, due to resignations, deaths, removals, &c. Eleven new members had been added, as compared with seventeen last year. The attendances at the ordinary meetings had been satisfactory, though the outdoor meetings had not met with the support they merited. Mr. F. Park (Treasurer) submitted a financial statement, which showed that the year commenced with a credit balance of 15*l.* 8*s.* 10*d.*, and concluded with a balance of 16*l.* 13*s.* 7*d.* on the same side. The report was adopted. The election of officers for the ensuing year was as

follows: *President:* Mr. W. Parry.—*Vice-Presidents:* Mr. J. S. B. Bell, Dr. Blacklock, Messrs. J. Pattison Gibson, J. Watson.—*Council:* Messrs. W. E. Cowan, A. E. Cowling, William Graham, George Hall, J. J. Kirkwood, E. G. Lee, H. G. Ridgway, Captain Sayers, Messrs. G. L. Snowball, L. Williamson. —*Lanternist:* Mr. H. G. Ridgway.—*Treasurer:* Mr. Fred Park.—*Secretary:* Mr. W. Thompson.—*Assistant-Secretary:* Mr. W. Parker Brewis. The programme for the present session then came up for consideration, and, amongst other items, it was decided to revive the "Beginners' Nights," which were so successfnl a year or two ago. A cordial vote of thanks was passed to Mr. J. Brown, the retiring Secretary, for his many labours on behalf of the Society.

FORTHCOMING EXHIBITIONS.

1897.

November 5, 6..... Brixton and Clapham Camera Club. C. F. Archer, 1, Gauden-road, Clapham, S.W.

,, ... Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.

,, 5–13 ..... Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.

,, 16–18 ..... Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.

,, 22–27 ..... Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.

,, 29, 30 ..... Durham City Camera Club. R. Hauxwell, The Avenue, Durham.

December 9–11 ..... Aintree Photographic Society.

,, 28–Jan. 1 . Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough-road, S.E.

1898.

January 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.

January–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.

April 22–30 .... National Photographic and Allied Trades Exhibition. A. C. Brookes, Temple House, Temple-avenue, E.C.

,, 27–May 14..... International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Patent News.

The following applications for Patents were made between October 13 and October 27, 1897:—

Lanterns.—No. 23,377. "Improvements in Stages of Optical Lanterns." A. Wrench.

Photo-mechanical Screen.—No. 23,427. "Screen for Making Photo-mechanical Printing Plates." Complete specification. M. Levy.

Lenses.—No. 23,463. "Improvements in the Manufacture of Lenses and the means used therein." Communicated by G. Roger. J. C. Fell.

Slide-carrier.—No 23,495. "An improved Automatic Slide-carrier for Optical Lanterns." L. E. Hopkins.

Roll-holders.—No. 23,506. "Improvements in Camera Roll-holders for Photographic Films." J. E. Thornton.

Animated Photographs.—No. 23,540. "Improvements in Lanterns for Producing Kinematic Pictures." Complete specification. E. Bell, J. Mohr, M. Lechner, and W. Krauss.

Cameras.—No. 23,729. "Improvements in or connexion with Photographic Cameras." J. E. Thornton.

Coloured Photographs.—No. 23,739. "An Improved Method of Producing Coloured Photographs." H. W. Cottrell.

Frame-carriers.—No. 23,825. "Improvements in Photographic Frames and like Carriers or Stands." W. Deakin.

Photographic Support.—No. 23,876. "A Stand or Support for Scientific Instruments, Photographic Apparatus, Bicycles, Music desks, Tables, and the like." Complete specification. E. Jungk.

Developing.—No. 23,897. "A Process and Means for Feeding Exposed Photographic Paper Strips through a Number of Baths." Complete specification. A. Schwarz.

Films.—No. 23,909. "Improvements in Apparatus for the Manipulation of Notched Sheets, more particularly applicable to the Changing of Notched Films in Photographic Cameras." C. Beck and J. T. Clarke.

Acetylene Light.—No. 23,917. "Appliances for Photographing by Acetelene Light." R. W. Sharp.

Dry Plates.—No. 24,021. "Improvements in and connected with Photographic Dry-plate Films and the like." A. G. C. Hunter.

Plate-holders.—No. 24,138. "Improvements in Photographic Dry-plate Holders." J. Schaub.

Animated Photography.—No. 24,273. "Improvements in or relating to Operating the Films for Animated Photography and the Apparatus therefor." R. H. Edwards.

Subaqueous Photography.—No. 24,347. "Improved Means of Indicating the Depth of Water in Rivers, Harbours, Seas, and the like, and Photographing said Depths to Scale or otherwise." J. Dillon.

Backing Plates.—No. 24,420. "An Improved Method of and Apparatus for Backing Photographic Plates and Films." B. J. Edwards.

Relief Photographs.—No. 24,539. "Improvements in Making Photographs or other Portraits Stand Out in Bas-relief." W. H. Prestwich.

Cameras.—No. 24,598. "Improvements in or relating to Photographic Cameras." A. L. Adams.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE EXHIBITIONS.

To the Editors.

Gentlemen,—Bravo the Eastman Exhibition! There is no doubt whatever but that the Company have shown us all the way! The whole conception and arrangement is so good and satisfying. The separate rooms for appliances, loan pictures, competition prints, and technical exhibits are capital, and the decorations are A1. Great thanks are due to Mr. Walton for the admirable way in which he has shown his originality of design. How badly the grandiloquence of the "forewords" of the Salon catalogue fits in with the poverty-stricken look of the room when you enter it, and the peculiar arrangement of the pictures. There seems nothing to enchain you for any lengthened period; you can pick out the "wheat from the chaff" there in a very short time, and you are out in the street again; but, in the New Gallery, the first room I was in was so interesting, that nearly an hour had gone before quitting it.

The "Royal" is certainly a better Exhibition than the "Salon," to my mind, and is not quite so eccentric; but, for taking the shine out of both the Eastman Company are an easy first! What with plashing fountains, a first-class band, courteous attendants to explain, a refreshment department, and good work displayed well in fine rooms, and, to cap all, free admission! I think that the thanks of all photographers, both professional and amateur, are due to the Company for this veritable A.1 display. You, sir, have rightly named it a "remarkable Exhibition," and it is a most useful one to photographers and very interesting to outsiders. It is quite the best thing of the year in matters photographic, and takes the lead right away, as having all the qualities that go towards making up a success. What a treat is the Invitation Gallery, crowded as it is with fine works by our foremost men. To name a few at random, Andrew Pringle's work is a fine picture, and gives us all the majesty, force, and turbulence of this fine Norwegian fall; it is a meritorious work, and worth studying. Sutcliffe's *Listening to the Birds* is also a grand photograph. Then, H. P. Robinson's *Wayside Gossip*—what can be finer than this?—and his *Gathering Bracken*, with its delightful summer atmosphere splendidly rendered, well posed models, its wreath of foliage, and beautiful clouds. These, with Bright's *Trafalgar Square*, and others, are pictures you may linger over, and are calculated to teach a man something of the art of picture-making by photography. They beat, easily, all the bichromated gum process pictures, and low-toned Salonic fuzzytypes. I notice that our own H. P. Robinson falls foul of the Salon in last week's Journal. This is quite a refreshing change, and I think he accurately voices the feelings of most photographers who have visited the Salon when he says, "it is possible to be too eccentric, and we seem to be drifting in the direction of habitual offenders, and are wallowing in the slough of Whistlerian muddle"—this is very well put, and, when a prominent friend of the Salon finds this out, there is hope for the future, and we may reasonably expect the next year's Salon to be a saner show. It is to be hoped that a good many of the most eccentric pictures of this year and previous years will be like *Pins and Needles*, get lost and forgotten, for, if this remains in evidence in, say, fifty years to come, that generation will assuredly say that some of the photographic picture makers living towards the close of the nineteenth century were a "mad lot."

In conclusion, I would strongly advise all photographers who can do so to see all three Exhibitions (if only to find out what to avoid), but especially to visit and study the Exhibition at the New Gallery, in Regent-street. It is a fascinating show—a photographic wonderland.—I am yours, &c.,

H. Hallier.

41, *High-street, Upper Sydenham, London, S.E.*

STAINED NEGATIVES.—THE SALON.

To the Editors.

Gentlemen,—The subject of stained negatives *versus* black-and-white being again brought forward, I should like to say that one reason, perhaps, of the difference of opinion has, I think, been overlooked—that is, that the yellow pyro stain may have some selective action on the light that passes though to the printing paper analogous to the effect that is obtained by printing through green glass.

The latter method was some years ago given in a formula by O. Scholzig, and perhaps others, for obtaining black tones. Any one who

has tried it will remember the efficacy of the plan. May it not, therefore, be probable that the stain chemically alters the silver salts, or deposits them in another manner to the light passed through unstained films, making the print take a different, and perhaps richer, tone subsequently? Platinum salts may also be affected in this manner. Perhaps some gentleman of more leisure could test this in an accurate manner.

There are so many letters *re* the Salon and Royal Exhibition that my opinion may, perhaps, go in with the rest. It is, that a great many of the pictures in both would be greatly improved by a little more brilliancy. Judging by other means of art, is it not general for etchings and paintings in water colours to be on white or very slightly tinted paper? Of course, some effects are good on brown paper, but a very small percentage. Yet, in many cases, the vigour and scale of nature are deliberately thrown away by printing from flat negatives or on dark papers. It would convince some of the exhibitors themselves, I am sure, if they would first try a print on a good vigorous paper, and compare with the dismal and untruthful renderings given by the flat, dark surfaces.

I am not speaking of "departing-day" style of work, but of many that aim at full daylight. Focus is a matter apart, but it is surely a mistake when the greatest range of tone obtainable falls far short of brightest sun to deepest shade to purposely throw aside any of the means we have.

It is this more than anything else, I believe, that leads the critics of the "dailies"—men, let us remember, without prejudice, and used to criticising other phases of art—to describe many of the photographs as not like anything in art or nature, but dimly resembling discoloured mezzotints, which latter were not meant to be discoloured by their producer, let us remember again.

Finally, I think some of these photographs are defended by being compared to chalk drawings on dark papers. But, if an artist draws in black chalks on dark paper, and thinks his work would be improved by a high light, he can *put it in*, and does so with white chalk or Chinese white. In a similar case the photograph is hopeless; we cannot paint that in white, the high light we might have had from a white ground *is not there*, and, should the picture need it ever so much, it goes without it.—I am, yours, &c.,

J. Godfrey Martyn.

The Studio, Southwold, Suffolk.

"MICHAEL."

To the Editors.

Gentlemen,—I have just read the words of censure of your critic in reference to a work of mine at the Salon.

Permit me to explain that the picture was first of all given the absurd title *Michael* at the Exhibition; how, I cannot explain, as the title, *A Squally Outlook*, figured both on the print and on the entry blank.

If, in the face of this, the opinion of your critic remains the same, I should, in all fairness, be allowed to explain how the picture came to be made.

I was photographing a bit of road after a morning of rain, in a little town of half a dozen houses called Stumpberg, in Indiana. While doing so, I glanced over the fence in front of the house where I stood, and saw what now so deeply stirs the choler of your critic—a little "hoosier" gazing intently at me through a window, his eyes riveted on my every movement. I immediately opened the gate, crept up to the window, and took the picture. Through it all the youngster retained a forbidding expression, as if he considered me an intruder, and a very unwelcome one at that. This, in brief, is the whole story.—I am, yours. &c.,

Rudolph Eickemeyer, jun.

The Eickemeyer and Osterheld Manufacturing Company,
Yonkers, New York, October 21, 1897.

THE RETURN OF SPECIMENS.

To the Editors.

Gentlemen,—The subject, of which much has been said, is an important one. If an assistant is out of employment, and he answers, say, two or three advertisements appearing in this Journal, he must have a considerable stock of specimens at hand in applying for a situation, if certain employers were to persist in keeping them for their own use, and plenty of spare cash, if he were compelled to pay return postage when he was fortunate enough to have them returned, for an assistant cannot always be sure of satisfying himself the first week of application; and then, again, it is only right that the expense should be divided; if the assistant pays one way, the employer ought to pay the other. Now, coming to facts, there is a certain employer who did not till quite recently pay postage at all on return of specimens. He was advertising nearly every week for assistants, their specimens would be returned, carriage forward, for the poor applicant to pay double postage. Personally I do not believe in specimens, for, as a rule, they are no criterion of a man's ability.

I think the revival of the "black list" would be of great benefit to photographic assistants generally, as certainly there is a lot of tyranny practised by certain employers, and it would be the best way to bring them to their senses. It surprises me to see that no one influential enough has not aimed at something of a photographic assistants' union that would regulate wages, hours, &c. The establishment of the "black list" would be the first brick in the foundation, at any rate; still, if we cannot get the whole, we must be satisfied with a little.—I am, yours, &c., Union.

To the Editors.

Gentlemen,—Your correspondent, "P. R. S.," whose letter is published in your issue of October 22, is anxious to know how it is there is a print hanging in my show-case at Camberwell exactly like one now hanging on the walls at the Royal, and both under different names. The picture in question, *A Child Study*, was photographed in my studio by my operator, to whom permission was given to exhibit. Mr. Swaine and myself are both exhibitors at this year's Royal.—I am, yours, &c.,

Albert Flint.

68, *Church-street, Camberwell, October* 29, 1897.

THE KINEMATOGRAPH.

To the Editors.

Gentlemen,—It was with disappointment we read your notice of the cinematograph accident at Bradford in your issue of the 29th. We had hoped that we had heard the last of carelessness, and that our appearance before the Court at Balmoral Castle had raised the condemned cinematograph to its proper place.

Some weeks ago, the question of insurance was raised by a leading insurance company.

We resisted the idea, and undertook to show that there *was not danger* in the cinematograph.

We put loose films in a bag, and ran through several films; then we put one into the machine, and left it stationary, and subject to a lime light gauged at 2500 candle power. It was over four minutes before the heat had any effect, and when it did ignite the film it was only the part in the aperture which burned. The increase of insurance has not taken place, and we are therefore satisfied that the officials were convinced of its safety.

The machine at Bradford must be one of those feeding from the back, and in that case there ought to be a guide and guard for the film to keep it away from the condenser.

We were at an Exhibition recently, where we saw what might have been an accident, and what we think must have been the cause at Bradford, the film accumulating between the condenser and projection lens.

We have our machines arranged that there is no possibility of the film getting near the condenser, and cinematograph operators ought to see to this at once. We cannot understand a film sticking in the machine.

We have given upwards of 300 exhibitions, using our machine 6000 times, and our machine has not stuck yet, neither have we had a breakdown, except amongst the first nights, and which was caused by ignorance; but this, fortunately, was in our own warehouse. What is wanted with the cinematograph is experienced and careful operators, who treat it as a scientific instrument, and not as a toy, with objectionable films, pandering to the gallery.—We are, yours, &c.,

Walker & Company.

19, *Bridge-street, Aberdeen, November* 1, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photographs Registered:—

John Horsburgh, 131, Princes-street, Edinburgh.—*Two photographs of Balmoral Castle.*

John Stuart, 120, Buchanan-street, Glasgow.—*Photograph of group of Board Directors, Glasgow Athenæum*, 1897.

Alfred E. Harris, 44, Partridge-road, Roath, Cardiff.—*Photograph of Sewd Einon Gam Waterfall, February*, 1895.

Tom Reveley, Market-place, Wantage.—*Photograph of Mr. Richard Croker, in his garden at Letcombe Regis, Wantage.*

John William Watson, 455, Smithdown road, Liverpool.—*Photograph of interior o St. Agnes' Church, Sefton Park, Liverpool.*

S. BROOKS.—Let us know the particulars of the quarter-plate lens referred to. Generally speaking, the answer to your question is, No.

W. A. GENT.—Sorry we have not the information by us; you do not give the years of the patents, otherwise we might have been able to trace what you want to know.

J. MILNE.—We cannot trace the paragraph by the aid of the meagre particulars given. Can you not indicate about the time of its appearance, and give us some idea of its nature?

SALTED PAPER.—A. B. (Burton-on-Trent). There is plenty of surface on the paper. If you read the instructions, you will see that it has not to be floated on emulsion, but on a plain solution of nitrate of silver.

OPALINES.—W. C. B. says: "Can you put me in communication with any firms that make opalines for views, also plush pads?"—In reply: The London Stereoscopic Company, 54, Cheapside; G. W. Wilson & Co., Aberdeen.

LEGAL.—J. W. (S. W.). The question can only be settled in a court of law (Chancery Division) and we do not envy the loser of the case his bill of costs. We cannot pass any opinion on the case, it is of too intricate a nature for us.

C. H. IMRIE.—1. Impossible to say, unless you give us details of your development formulæ and mode of procedure. 2. Decidedly. Pay a visit to the Eastman Exhibition, where prints are shown illustrative of the variety of colours obtainable.

VARNISH.—PROF. A varnish with shellac as a base is preferable to one made with sandarac. The latter is a much more brittle and friable resin than the former, therefore the varnish made with it is more liable to abrasion with rough usage than one composed of lac.

GELATINE NEGATIVES.—ALFRED DUGAN. The greatest protection to gelatine negatives seems to be when they are coated with collodion before they are varnished. Of course, the collodion must be uniodised. That sold under the name of enamel collodion is the best for the purpose.

CERAMIC ENAMELS.—T. E. HAWKE says: "Where can I obtain materials for ceramic enamels?"—Your simplest plan will be to obtain a little book on the subject published by Messrs. Dawbarn & Ward, 6, Farringdon-avenue, E.C. This gives the particulars you require in great fulness.

COMMISSION.—COMMISSION says: "I have been working for this last three months on salary and commission. Business being very slack, I have been given notice to find another berth. Can I legally claim commission on money booked to account?"—In reply: Yes; we think so.

LENS.—C. BLAKE. The "yellowish irdescent stain" on the lens can only be removed by repolishing it. Some of the new glasses are very prone to deterioration, but they are seldom used now, unless they are "sandwiched" between two others. Your lens, we suspect, must be one of the earlier ones issued.

LENS —AMATEUR (E. C.). The only way you can make your quarter-plate lens available for covering a cabinet-size plate is by using the front combination as a single lens and using a small stop. That will be of no moment, as what you desire to photograph is groups of game, fruit, and the like, where the time of exposure is of no moment.

F. BEWLAY.—We fear we cannot recommend any process of proved value; but possibly you may derive a hint as to how to experiment yourself from the fact that negatives from negatives may be made in an ordinary printing, using a slow plate and exposing in diffused daylight for about eight seconds. It comes to this, that extreme over-exposure may give you the result you want. Use a slow plate.

LENSES FOR STEREOSCOPIC PURPOSES.—T. MALONY. It is very desirable that the lenses should be of identical focus, but the difference of "less than the sixteenth of an inch" in a pair of six-inch focus may be disregarded in practice. When there is so little difference as this, it may be easily rectified by slightly lengthening or shortening the distance between the components of one or other of the combinations.

LENS.—W. COLLMANN. If you cannot afford one or other of the new anastigmatic lenses, the best you can have, for general work, is one of the "rapid" type with an aperture of *f*-8. One of about fifteen or sixteen inches focus will be best for your purpose, one of thirteen inches focus would cover the size, but it would require to be stopped down to do so, whereas the longer-focus one would do it with full, or nearly full, aperture, thus admitting of a shorter exposure.

DAMAGED BELLOWS.—F. E. G. says: "Will you kindly advise me what best to do with bellows of large enlarging apparatus (Lancaster's) which has got knocked out of shape? It is quite light-tight, but the folds will not go in their proper place without much trouble."—If the foundation of the bellows has kinked or broken, we fear there is no remedy but a new one. If it is still light-tight, though inconvenient to use, it will continue to answer its purpose, for some time to come.

EXHIBITING PHOTOGRAPHS.—CHARLES F. WYNNE says: "1. Will you kindly inform me if I can be prevented from exhibiting photographs of an opera company (*Pepper's Ghost*) playing here last week, photographed in their different costumes? The work referred to has not been charged or paid for, therefore I think I should be at free liberty to exhibit if I wish. One of the company has given me instructions not to exhibit his, because I would not supply him with a half-dozen each from four different positions in return for a background he painted for me at his own wish. Can he or any of the company prevent me from exhibiting them? 2. Also, if they were paid for?"—In reply: 1 As you have received no consideration for the photographs, the copyright is yours. You may do what you please with them and cannot be prevented from exhibiting them. 2. Probably, in these circumstances, you could be compelled to discontinue their exhibition.

COPYRIGHT.—W. R. writes: "One of my customers was taken yesterday in the style of a well-known engraving. She was dressed in a dress as nearly like that in the picture as it could be made, and I was desired to pose and light the figure exactly the same. Will you tell me if doing this can be construed into an infringement of copyright? I may say that in the engraving there is a landscape background; in my photograph I have used a plain one."—There is no infringement of copyright.

ENAMELLING BROMIDE PRINTS.—H. J. (Cheltenham) asks: "Would it be possible to enamel bromide prints? Not having seen any, I am at a loss to know. Also, how would varnish act, supposing it was applied to the print?"—Bromide prints can, of course, be enamelled, like any other prints; but it would destroy the character of the picture. They could also be varnished, but varnish would be more out of keeping with bromide prints than enamelling. Why not try a few prints both ways? You will then be able to see if you like the effect. Tastes differ, you know.

LENS.—J. W. HEAWOOD writes: "Some time ago I bought a lens second-hand, which I like so much that I am anxious to have another of the series, of a larger size. I have tried many dealers, but none of them could enlighten me. The flange bears a trade mark, a rough sketch of which I give below, trusting you will recognise it, and give me the information."—So far as we remember, we have not seen the trade mark before, but it is evidently that only of a dealer, and not the maker of the lens. *Makers* of lenses do not, as a rule, if ever, stamp the flanges of their lenses with their names or trade marks.

DISCOUNTS.—NUMBER ONE says: "Can you oblige me with a little explanation *re* discounts? Plate-makers and dealers offer fifteen per cent. and five per cent. extra off 25*l* worth of plates if paid before end of month following date of invoice; but, when I send them 20*l*., which is the twenty per cent. promised, they are puzzled to know how I arrive at the amount. Their way is fifteen per cent. off invoice, and an extra five per cent. off balance, which slightly alters the total. Who is right?"—In reply: We are in a position to say, from our former commercial experience, that the makers are right.

TINTED ALBUMEN PAPER.—S. H. & CO. write: "Can you tell me if the rose tint on the —— brand of albumenised paper is permanent? It is said to be, but some prints that have been in our show-cases during the summer seem to have changed considerably; the prints have faded a good bit, but where the margins have been hidden by the mounts the pink is stronger than the other portions, but the image seems to have faded more."—We cannot say whether the pink on this particular brand of paper is permanent or not; it would seem that it is not. We can say, however, that the roseate tint on most papers is fugitive if long exposed to strong light. The tint may be easily tested by putting a piece of the unsensitised paper in a frame, covering up a portion and exposing to strong sunlight for a few weeks.

INCANDESCENT LIGHT.—I shall be greatly obliged if you will answer the following. I wish to take a group of about twenty-seven people, including eight young children, by artificial light. Would eight incandescent burners, backed by a white reflector and placed half way between the camera and the end of the group, be sufficient illumination? If so, about what exposure, with medium stop and plate? If not, what would you consider the fewest number of burners, and what the best arrangement of same?"—In reply: We think you would require at least three times the number of burners mentioned. With "medium-sized" stop and rapid plate, an exposure—we are merely giving a rough idea—of four or five seconds might be given. See an article on the subject, p. 177 of the JOURNAL for 1893.

GEM PORTRAITS.—W. C. C. asks: "Would you be kind enough to give me a little assistance on the following? We have a stamp photographic camera with twelve rectilinear lenses, which gets splendid negatives in the studio, but we have a difficulty with copies owing to not being able to get close enough up. I have tried removing the back combination, which is a great improvement, but still not enough, as you will see from enclosed negative (top-half). I want the whole dozen to be true (as this), and should be very glad if you could let me know if this is possible. I have, of course, seen the above, but cannot see how it can possibly work at a short distance, or be "always in focus," when you are copying pictures of various sizes to about one size (stamp)."—If the pictures to be copied be placed exactly opposite the centre lenses, all the copies will be practically sharp. As the lenses are of very short focus, there will not be much variation in the focus unless the original is placed very close to them.

WET-COLLODION PROCESS.—PROCESS asks: "Would you be so kind as to inform me, through your Correspondence columns? 1. Whether the wet-plate process is to be recommended for portraiture and landscapes? 2. Also if you would prefer pyro-citric acid intensifier before fixing to mercury after fixing? The former always seems to me a very uncertain method. 3. Is the collodion film easy of successful retouching? 4. Do you know of a collodion emulsion process that can be used both wet or dry? I may say, being a process photographer, I am thoroughly familiar with the process as applied to half-tone; but, as you are aware, in that case the desired negative consists of a series of absolutely opaque and perfectly transparent dots. Would thirty-five grains be strong enough for bath?"—1. Yes. Till the introduction of gelatine plates it was the only process used. The results were as good as those on gelatine plates. Of course, collodion is slower than gelatine. 2. Pyrogallic acid certainly; better half-tones will be secured. 3. Yes; but it must be varnished first. 4. There would be no advantage in using the emulsion wet unless you were working with an unwashed emulsion; then it would save trouble. Thirty-five grains to the ounce will be the right strength for the silver bath.

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No. 1958. Vol. XLIV.—NOVEMBER 12, 1897.

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NOTICE OF REMOVAL.

On January 1, 1898, the Offices of the "British Journal of Photography" will be Removed to No. 24, Wellington-street, Strand, London, W.C.

EX CATHEDRÂ.

The Special General Meeting of the Royal Photographic Society, which was held on Tuesday, November 2, and a report of which appeared in our last number, brings to an end, it is to be hoped, a state of things that has existed in the Society far too long. At last the rules have been verbally amended where it appeared desirable that amendment of this nature should be made; the Society has decided that the old practice of printing on the voting papers for members of Council the names of nominees and nominators shall be retained, and has also rejected the proposition that "new blood" should be compulsorily introduced into the Council.

* * *

The situation of affairs is, therefore, practically what it was two years ago, before the "new-blood" agitation was inaugurated. A confirmatory meeting is to be held on Tuesday, November 27, and there is little doubt that the new rules will then be adopted *en bloc*. We are sure we are giving expression to a hope which is felt right throughout the Society, that the word *finis* should be written to the long-drawn-out episode which reached a termination on Tuesday week, and that henceforth there shall be the heartiest unity and combination among members to promote the best interests of the Society and the cause of photographic progress.

* * *

The *Scientific American* gives particulars of an acetylene explosion which took place recently in a machine shop in Rochester, New York, Valentine Long, Frank Long (his brother), and Jacob Fascott, an *employé*, being injured by an explosion of the tank used in making the experiment. Valentine Long's skull was fractured over his right eye, and he lost the sight of both his eyes. It was said at the city hospital that he would probably die. The other two men were not seriously injured. The tank was a strange-looking affair, about two and a half feet in diameter, and made of galvanised iron, with bands of iron running along the sides to give it strength.

* * *

It was placed in Long's shop by an acetylene company, recently formed in Rochester, in which Mr. Long was interested. At the time of the accident Valentine Long was preparing to make a pattern for a new valve that is used on the tank. A lighted gas jet that stood about three feet above the tank is supposed to have ignited the acetylene and caused the explosion. Fascott had a narrow escape from instant death. A piece of the iron from the tank grazed his body, cutting off the buttons from his trousers, and making a rent across the bosom of his shirt.

* * *

The Lumière kinematograph has recently been shown in operation before the members of the Royal Photographic Society, and on Monday evening, November 1, Mr. Jules Fuerst gave the evening visitors to the Pall Mall Exhibition an opportunity of examining between forty and fifty animated photographs taken with and projected on the screen by the Lumière apparatus. Upon the latter occasion we ourselves were among the audience, to whom, we observed, the excellence of the results that were shown came quite as a revelation, as

indeed it did to us. From a not inconsiderable experience, as spectators, of projected animated photographs during the last two years or so, we can cordially congratulate Messrs. Lumière upon having reduced the vibration and flicker of the images to a minimum. Indeed, among the results shown on Monday week, there were some in which, from the back of the room, we could scarcely detect the slightest movement, except that of the figures in the views.

* * *

The Eastman Exhibition at the New Gallery has drawn an average daily attendance of about 1000. The entire Exhibition is to be dispatched, at the end of the year, to New York, where, supplemented by a specially organized American section, it is to be shown in suitable galleries that have been secured for the purpose. On the evening of Friday, November 5, a special *conversazione* was arranged at the New Gallery for the *employés* of the Company and their friends, and these to the number of about 700 were conveyed from Harrow to Euston by special train. On the invitation of the Company, we paid a visit to the gallery in the course of the evening. Music and light refreshments had been provided, and the function appeared to be highly appreciated by the large company present, among whom were Mr. Eastman, Mr. Dickman, Mr. Davison, Mr. Pringle, Mr. Harold Senier, and contingents of the Company's *employés* from Paris, Berlin, and Rochester (N.Y.)

* * *

Our contemporary, the *Gentlewoman*, announces in connexion with its Literary and Art Society the formation of a Photographic Section, in respect of which it says that careful criticism will be given to every contribution, that the editor reserves the right to publish any of the work sent in, and that all photographs published will be paid for. Thirty-six guineas in prizes are offered, and the following are the regulations for the Section :—(1) The photographs must be mounted, and endorsed with particulars as to camera, lens, stop, exposure, plate, developer, and paper; (2) the photographs will be submitted to professional judgment; (3) the prizes will consist of apparatus or chemicals chosen by the winners from selected firms; (4) for every photograph used other than the prize photograph, an honorarium to the value of 2*s.* 6*d.* will be sent; (5) if stamped and addressed wrappers are enclosed, the photographs not published will be returned; (6) gentlemen may join this section. Future photographic competitions are—November, A Village Church (exterior); December, Old Age; January, A Winter Landscape.

* * *

In the number of *Knowledge* for November appears an enlarged photograph of the moon, printed in collotype. The enlargement was made by permission of the Astronomer Royal from a photograph taken by Mr. T. Lewis, F.R.A.S., with the twenty-eight-inch refractor of the Greenwich Observatory. There is a considerable amount of detail in the photograph, in reference to which our contemporary makes the remark that it was taken with a refractor ordinarily corrected for the visual rays, but which, according to the plan suggested by Sir G. G. Stokes, has been adapted for photography by reversing the crown lens, and moving it somewhat further away from the flint lens. There are, it adds, several other methods of securing the same result — the new triple achromatic object-glasses, designed by Mr. Dennis Taylor; the addition of a correcting lens to an ordinary achromatic, as in the thirty-six-inch refractor of the Lick Observatory; and in the employment of orthochromatic plates. It should, however, be remembered that no objective has yet been constructed on Mr. Dennis Taylor's principle nearly so large as the twenty-eight-inch refractor of the Royal Observatory, Greenwich, and that the aperture of the Lick object-glass is usually cut down to one-fourth of its full diameter when used for lunar photography, whereas the full twenty-eight inches were employed in the Greenwich instrument. The plate used was a Hill-Norris dry-collodion plate, Eagle brand, with an exposure of half a second, and it was taken on March 12, 1897, at 10 h. 3 m., G.M.T.

MODERN DEVELOPERS AND THEIR FORMULÆ.

Hydroxylamine, pyrocatechin, hydroquinone, eikonogen, para-amidophenol, amidol, metol, rodinal, glycin, — all of which have only comparatively recently come into vogue, or indeed, in some cases, been discovered—have all enjoyed a measure of popularity; and, within the last few weeks, amido-resorcin, diphenol, and ortol, are candidates for popular favour; but, at the present time, for general all-round work we hear mainly of hydroquinone or metol in connexion with plates, and occasionally of amidol; for paper, all three are often spoken of. How is this? When the gelatino-bromide plate first began to be popular, we heard of little beyond oxalate of iron, made, too, by dissolving the actual ferrous oxalate itself in potassic oxalate solution. In this country it gradually gave way to pyrogallic acid, as having more elasticity of adaptability, though on the Continent it long remained the favourite. At the present time, for one user of the ferrous-oxalate developer, even when made under the present more simple plan of mixing ferrous sulphate and potassic oxalate in suitable proportions, there must be ten thousand who employ pyro. Then, again, with the latter material changes are rung on the alkalies and their carbonates. We have caustic soda, potassa, and ammonia, and also their carbonates; and from time to time much has been written as to the advantage of one or the other of these materials for use with pyro, and, though to a great extent ammonia still holds, there are many workers who are earnest exponents of the virtues of the fixed alkalies. But not many of these users could give a reason for their faith, or, at any rate, could refer to authorities explaining their peculiarities.

But how does the matter lie with regard to these modern developers, which have been placed in our hands as the result of investigations in the aromatic compounds of the most intricate description, and whose properties had been indicated by a most beautiful series of propositions even before the substances were actually made?

Why have the numbers been reduced in the way that we allude to? We know, of course, that hydroxylamine was discarded before because of blisters in the film, traced to the production of bubbles of hydrogen set free during the decomposition of the substance in the act of development. We know that amidol has been considered devoid of elasticity on account of the difficulty, almost impossibility, of using any alkali with it, sulphite of soda being all that can be added with impunity to this developer. That certainly reduces the number for whose supersession a plausible reason could be advanced on the ground of practical considerations, and to them may be added pyrocatechin, which, on account of its being an ortho substitution product, might, on theoretical grounds, be considered likely to be less efficient than its para-

isomer hydroquinone. But, admitting the cogency of these suggested causes, it must be admitted that there does not exist any logical statement of the case, and we may be said to stand in the position of being in possession of a number of tools of valuable quality and ingenious mechanism as to whose merits we mainly guess, and as to whose use we merely familiarise ourselves with one or two of the leading ones.

But, as if this were not illogical enough, if we devote a little attention to an examination of the formulæ recommended for their use, allowing at the same time as much latitude as is necessary, in the instance of pyro, for the particular plate experimented with, and we shall find most unscientific methods in vogue. Taking first the recommendations of the inventors themselves of the new substances, the first thing that strikes us is the great differences in what might be termed the developer strength of the new developing agents. Taking eikonogen at twelve grains per ounce of solution, we come down through glycin at six grains to metol at a grain and a quarter. Assuming these figures to represent average proportions desirable in practice, it would follow that the former-named material, of which eight times as much as of the latter is required for a given amount of developer, must be eight times as dear. This is an argument which would be instantly fatal against the further use of eikonogen, unless some substantial grounds were shown for its being retained. There may be such; but where is there to be found any scientific dogma upon the subject? Nowhere! We have lately been endeavouring to tabulate all the various formulæ of the developing chemical maker, and those of the dry-plate maker; but the task is immense, and, unless entered into with a profusion of detail which would tend to make the whole useless through its voluminousness, could not be done in as complete a manner as is desirable in such compilations. All, therefore, that at the present moment we would wish to say is, that a scientific investigation of the qualities and the strength needful in using these new materials would be one of the greatest boons that could be conferred upon the thoughtful photographic worker.

Titles to Pictures.—Some photographers fix upon a title and then take a picture to suit it. Such pictures usually sustain the title. Others on the contrary, take the photograph first and find a title to fit it afterwards, and often a difficult task they find it. Not so, however, with many works of the "Salonesque" type, as half a dozen or more different ones would be equally as appropriate as those fixed upon. We have even known the same work to be shown at different exhibitions under different names, and quite as suitable ones. Artists—that is, painters—have before now changed the names of their pictures between the time they were painted and exhibited. That is all legitimate enough, but we do not know of any body or committee of selection who would take the liberty of changing the painter's title of his picture; not even the Royal Academy would think of doing such a thing.

Any such scruples, however, do not exist at the Salon, as will be seen from Mr. Eickemeyer's letter in our last issue. He sent a work to the show with the title *A Squally Outlook*, and that title "figured both on the print and on the entry blank." But the Committee of Selection, in their wisdom, thought fit to alter the title to the most absurd one of *Michael;* hence, in our notice of the photographs, we characterised it as a "pointless joke" either on the part of Mr. Eickemeyer or the Hanging Committee. The Linked Ring, or certain links of it, are on exceedingly good terms with themselves with regard to their self-supposed art knowledge, and it is they who, it may be assumed, took upon themselves the liberty of changing the title of Mr. Eickemeyer's work. To that gentleman is certainly due the apologies of the Linked Ring for the indignity inflicted.

The Guildhall Art Gallery.—It has been announced that one day last week, the late Lord Mayor, the President of the Royal Academy (Sir Edward Poynter), with Mr. Temple, the Director of the Guildhall Art Gallery, viewed the pictures which, we mentioned a little while ago, Mr. D. P. Sellar has so generously offered to present to the Corporation of London towards the formation of an art collection in the City. These gentlemen will, in due course, make a report of their inspection to the Corporation, and also to Mr. Sellar. It would seem to some that not to at once accept so handsome a present would be ungracious, but it is not so. The generous donor's intention is that the City should have a picture gallery worthy of the chief City of the world, and the Corporation are anxious to obtain it. Therefore, as a precept in other, and it is hoped many future, offers of works of art, some discrimination is to be observed before they are finally accepted. There is an old aphorism, "You should not look a gift horse in the mouth," but that does not apply in the case of the formation of a National or Municipal Art Gallery, which is to be handed down to posterity.

A Dry October.—Those who followed photography out of doors during September are fully aware of the weather they had, that is, in England. October has been different. From the returns issued, it appears that last month was the driest in London, with one exception (1879), since 1834. During the past eighty-four years these three—1834, 1879, 1897—it seems, were the only Octobers in which the total rainfall in London was less than half an inch. However, the absence of rainfall has been somewhat compensated for, if compensated for it be (?), by fog, or, rather, darkness. However, thanks to gelatine plates, the photographic business in the metropolis has not been so much interfered with by the weather as it would have been in the days of wet collodion.

The Andrée Polar Balloon Expedition.—The "dailies" each day last week had something about the Andrée expedition. It seems that certain Norwegian captains have reported that they heard mysterious cries on Spitzbergen from their vessels, which they attributed to birds, though it is thought there is the possibility that they may have come from Andrée. This, however, is considered very doubtful by those familiar with the Arctic regions and the conditions of the explorer's voyage. However, the Norwegian Government have meritoriously dispatched an expedition in search of Andrée. The *Victoria*, with fifteen men on board, provisioned for a winter, left Tromso on Friday last, but it was afterwards delayed by a storm. The cost of this search expedition is being defrayed by the Norwegian Government. The Swedish Government, however, offered to bear half the cost, but Norway replied that it would bear the whole of the expense. It will be remembered that, when Herr Andrée's project was first brought before our Royal Geographical Society, strong doubts were expressed upon the scheme and its success.

Anent Arctic expeditions, another, not balloon, in which the Royal Geographical Society is interested, is to start next year. It is said that Lieutenant Armitage, of the Jackson-Armsworth Expedition, is to have the command, and it is doubtful if it could be placed in better hands, as past experience in the Arctic regions is invaluable in all expeditions to the Pole. Of course, in this projected expedition, photography is to be an important feature.

MODERN NEGATIVES AND PRINTING PROCESSES.

The subject has been quite recently discussed at one of the meetings as to whether pyro stain in a negative is advantageous or otherwise, and several practical workers have expressed their opinions decidedly in its favour. There can be little doubt, and I think no one will deny, that, under some circumstances, the yellow colour given to the film by the pyro developer results in a distinct improvement in the printing qualities of the negative; on the other hand, it is equally certain that, under other conditions, the effect produced may be the very reverse. Such a case in point has just occurred with me, and

points a moral as to when and how the stain may be advantageous, and when otherwise.

Although the question has been considerably mixed up with others, I do not propose to enter into any discussion of what constitutes a perfect negative, or which is the best printing process for general use; my intention is rather to show how the treatment of the negative, as regards the production or avoidance of the stain, can be best carried out to suit other circumstances which are unavoidable.

I was asked a few days ago to take an "at home" portrait under conditions that involved a certain amount of difficulty. It was not a case in which I had much choice in lighting, or could dance my sitter all round the place until a satisfactory illumination had been secured, since that point was practically settled for me. The subject was an invalid lady who had to be taken in her favourite chair in her usual corner—in fact, in her "habit," as she was usually to be found by those who knew her best. The apartment was a large one, lit by three French windows opening on to the lawn, and facing nearly due south; but, very fortunately for me, the morning was a dull one, with no sun, though, not quite so fortunately, the light was very yellow. Consequently, although at ordinary times the room is well lighted, on the occasion of my visit the conditions did not look very promising.

To add to the difficulty, my subject's chair stands only about four feet from one of the windows, and when seated at her reading she is turned three-quarters from the light, so that the strong light falls upon her head and shoulders, and upon one-half of one cheek, the rest of the face being in deepest shadow. To still further decrease the chances of a successful issue, the dress was of black material, with, however, a good deal of satin ribbon to relieve its general sombreness, though this came generally in the deepest shadows; a light-coloured, knitted wrap was thrown over the shoulders, and a snow-white mob cap, with black satin bows, completes the description of the subject so far as the figure—of course, the principal object in a portrait—was concerned. It will thus be seen that the best-lighted portions of the figure were just those that could best afford to be in shadow.

Of course, some of my readers will say at once, "Why didn't you arrange for a different style of dress?" or, "Why not shift the chair into another position?" I can only repeat it was "Hobson's choice;" the portrait had to be taken as I have described it, not as I should have liked it, to make it easy.

Although the sitter's position was fixed, I had a certain amount of liberty in selecting my point of view, and was fortunately able to arrange so that the shadow side of the face was outlined against a light part of the wall; the surroundings generally were fairly evenly illuminated, it was only the figure that, from its position, presented the severe contrasts I have described. At any rate, I did the best I could under the circumstances, gave the longest exposure I dare—about two seconds—and left the rest to Providence and "control" in development.

Before leaving I made other exposures on another sitter, though not in the same position, but in a perhaps equally difficult one, which served as "sighting shots" before proceeding to the development of the more important plates; and, as it proved, it was lucky I did so. The general conditions were the same, a generally bad light concentrated on a portion of the face, and a very short exposure taking the conditions into account.

I have tried, and actually worked with, most of the developers that have been introduced, but, like a good many others, I generally fall back upon "pyro and ammonia" in all ticklish cases, or when I want to develop a plate "for all it is worth," as I did on this occasion. So I started with weak pyro and metabisulphite, one grain to the ounce, a minimum of bromide and ammonia solution added in small quantities as required, developing slowly and carefully to get all the detail possible with as little density. Result—face and shoulders strongly lit and almost opaque, detail in the shadows almost absent, and what there was, after fixing, overpowered by the inevitable stain—a result, in fact, that I should a short time back have thrown on one side as utterly useless, but that was before I had begun to study modern results and methods.

Feeling certain that metol in some form would "extort" more detail, I mixed up a modification of my favourite developer, metoquinone, using three grains each of metol and hydroquinone, and two grains of metabisulphite of potash to each ounce, with ammonia solution as required as in the previous case. Although with this developer for ordinary subjects I use a certain proportion of bromide, on this occasion I omitted it because with the short exposures given the restraining action of the hydroquinone is quite sufficient to curb the "rush" of the metol, and I wanted to have as little unnecessary restraint as possible in the interests of the shadows. The result with this was a great improvement—considerably more detail and less density in the high lights, so I proceeded with the same mixture to one of my important exposures.

As development proceeded, I found the strongly lighted portions of the head and shoulders coming on too quickly to density, so I diluted the developer with one-half its original volume of water and ammonia in proportion, and had the satisfaction, rather to my astonishment, I must admit, of seeing every detail appear on the shadow side of the face, though at the same time the high lights on the cheek and shoulders were becoming ominously black. However, I continued the development until the shadows began to veil, and then washed and fixed. The result proved better than I had originally anticipated, for, although the highest lights proved to be practically opaque, I had hopes that they could be locally reduced, while the shadow side of the face exhibited every detail, but so faintly and delicately that I almost despaired of getting any printing result from it.

The second negative of the same subject was developed with the same developer reduced to one-third the original strength, *i.e.*, one grain each of metol and hydroquinone to the ounce, and resulted in an image with all the detail that was in the other, though even fainter, but the high lights were beautifully clear and printable. The surroundings of the figure were in both negatives all that could be wished, because, as I have already said, they presented none of the difficulties.

So far as these negatives are concerned, if I had turned them out, say, no further back than a couple of years ago, I should simply have done the job again, as being the easiest way out of the difficulty; but, during that later period, I have been gradually learning that, in the opinion of a great many exhibitors and Judges alike, what we used to call "under-exposure" is an artistic good point. So I set to work, although I am by no means an adept at "faking," to do what I could with my two productions. On the negatives themselves I attempted nothing beyond softening the harsh shadows and rounding the line of the cheek, and rubbing down with alcohol the highest lights in the denser one. Then I bound them with gummed paper to ground glass, and on the latter hatched and cross-hatched all over the weak parts of the face, laying the lead on as thickly as I could over the shadows, while over the high lights I put touches of gum water to restore the transparency of the ground glass. This was the full extent to which I dare let my "artistic" (?) capabilities run, but the result pleased both myself and my friends for whom the work was done.

Of course, the negatives were printed on gelatino-chloride paper, for I dread to think what the result would be upon albumen—especially weakly sensitised. And that leads me to say that I more than ever agree with what has been said more than once, and by more than one individual, that "perfection" in a negative depends, not only upon the class of effect that may be required, but also upon the printing process to be used. The careful and systematic worker will, of course, do the proper thing, and make his negatives to suit the process to be used in printing, while the more happy-go-lucky individual can console himself with the thought that, no matter what sort of negative he chances to turn out, there is sure to be some printing process that will give a decent result from it if he make a judicious selection.

As regards pyro stain, I think its advantages where they exist lie in connexion with over-exposed rather than under-exposed negatives, where, with a plenitude of detail, the image stain, *i.e.*, the extra stain produced by oxidation under and in admixture with the silver deposit itself, will give that detail a printing value it does not possess in itself; but, in an under-exposed plate devoid or

nearly so of detail, the presence of any general or film stain only operates against what little detail may exist.

In conclusion, also, I am coming round to a belief in the legitimacy of a certain amount of, if not "faking," at least, what Mr. Horsley Hinton terms "control" in printing. I do not think that any one can fairly object to the small amount of work I have described as put upon these negatives, nor do I consider it "faking." It is simply local control of the light in printing, and, if it succeeds in rendering printable detail *in the negative* that would otherwise be useless, it seems to me it is quite as legitimate in obtaining the same result by, say, intensification. It is an entirely different thing from *painting in* the same amount of detail, which I consider comes justly under the title of "faking."

W. B. Bolton.

VARNISH.*

There is another class of varnish, which is practically celluloid, *i.e.*, a solution of pyroxyline, or celluloid itself, in amyl-acetate, amylic alcohol, acetone, &c. This gives an extremely hard film, which, however, is not suitable for retouching. Such a varnish is made by dissolving from seven and a half to ten parts of pyroxyline or celluloid in 500 parts of amyl-acetate. The only disadvantage of this varnish is the very long time it takes to dry and the unpleasant smell of the solvent. It requires no heat, however, to ensure a bright film, and the negative, as soon as the varnish, which is generally known on the Continent as zaponlac, or here as zapon varnish, has set, may be placed in front of the fire, and will readily dry in about six hours.

Bleached shellac is sometimes suggested as an ingredient for aqueous shellac varnish, but, unless freshly bleached and kept under water till used, it is almost insoluble in alcohol. It does not give by any means such a good protective coating as the orange or gum lac.

Matt varnishes are occasionally useful, and, for stopping-out purposes on the backs of negatives, there is nothing to equal it, as it may be coloured to any extent. The best matt varnish is obtained by a mixture of sandarac, mastic, ether, and benzole.

Black varnishes are, of course, invaluable for certain purposes and for stopping out, and for this work there is nothing to beat Day & Martin's Brunswick black, which can be thinned down with chloroform or ether.

Before proceeding to give formulæ, it may not be without interest to reproduce some tests as to the resistant powers of varnishes which were made by Miethe in 1891.

He first of all points out that the spots on the varnish caused by damp have a very similar appearance to crystallisations, but that, when examined under a microscope, they are at once seen to be merely a series of concentric curves arranged round a central spot, and they are caused by the penetration of water through the pores of the varnish, the swelling of the gelatine, and the consequent fracture of the varnish.

Miethe also points out that spots are frequently caused on the negative itself by this damp absorption, and suggests that the remedy is to remove the varnish, which is best done by soaking the plate in caustic potash (ten grains), methylated alcohol (one ounce), and rubbing with a pad, and repeating the operation till all the varnish is removed; then well washing, and treating the plate for a few minutes to a saturated aqueous solution of tannin; then washing for half an hour, quickly drying, and then revarnishing.

Miethe made certain tests by coating plates with various varnishes, and then dropping water on the varnish, with the following results :—

1. Negative varnish on a gelatine plate: spots formed in about three quarters of an hour.
2. Shellac varnish on a gelatine plate: spots formed in ten minutes.
3. Negative varnish on collodion: no action after forty-eight hours.
4. Negative varnish on plate glass: no action after twenty-four hours.
5. Zapon varnish on gelatine plate: spots formed after some hours.
6. Zapon on collodio-chloride transparency: no action after twenty-four hours.
7. Zapon on carbon image: spots after twenty-four hours.
8. Negative varnish on hardened gelatine plate: spots formed after twenty-four hours.

It will at once be seen from this that a hardened film is by no means so liable to spotting as when not tanned, and with this idea some experiments were made which showed that by treating a negative for a quarter of an hour with formalin, well washing and drying, and using gold size varnish, as suggested by Ashman, and also by using zapon, no spots were formed when a drop of water was allowed to remain on the film for ninety-six hours.

* Concluded from page 711.

Matt Varnish.

The best matt varnish is obtained by using a mixture of sandarac and mastic as follows :—

Sandarac	90 parts.
Mastic	125 ,,
Ether	1200 ,,
Benzine	500 ,,

The mastic and sandarac must be first dissolved in the ether, and then the benzine added. This varnish takes the pencil very readily, and becomes harder if heated.

Lainer has suggested the use of toluene, instead of benzine, on the score of cheapness, and gives the following formula :—

Sandarac	10 parts.
Ether	100 ,,
Toluene	35 to 40 ,,

Both these varnishes may be coloured, if necessary, by adding one part of aurantia or chrysoidine to every 200 parts of the varnish, but in the case of aurantia the dye fades; a deep brown varnish may be obtained by adding about the same quantity of asphalt.

Retouching Varnishes.

These may be made either with turpentine or benzine, or a mixture of both, the turpentine naturally taking much longer to dry :—

Dammar	1 part.
Turpentine (commercial)	5 parts.

or,

Dammar	20 parts.
Pure rubber	2·5 ,,
Benzine	500 ,,

or,

Dammar	10 parts.
Spirits of turpentine	75 ,,
Benzine	75 ,,
Oil of lavender	2 ,,

Black Varnishes.

These are useful, both matt and glossy, and the latter may be made as follows :—

Bitumen	10 parts.
Yellow wax in shavings	4 ,,
Lamp or ivory black	2 ,,
Turpentine	100 ,,

Allow to stand for three hours with occasional shaking, and then melt on a water bath.

In The British Journal Photographic Almanac for 1897 Fleck's formula is given, which is, of course, very simple :—

Sandarac	10 parts.
Absolute alcohol	100 ,,
Nigrosine (five per cent. alcoholic solution)	10 ,,

For a dead-black varnish the best is one also given in the Almanac :—

Water	500 parts.
Borax	15 ,,
Shellac	30 ,,
Glycerine	15 ,,

Dissolve by the aid of heat, and add—

Aniline black	60 parts,

and apply with a brush.

It is obvious that any of the cold varnishes may be made of any colour by adding to them suitable, that is, spirit soluble dyes.

Cold varnishes may be either the amyl varnish already mentioned, or ammoniacal alcoholic solutions of resins; and, whilst these latter are by no means so resistant as the same varnish without ammonia, they are at times extremely convenient, and the same remark applies to any alkaline

resin varnish. A good cold varnish, though not of great resistant power, can be made as follows, according to Valenta:—

Sandarac	18 parts.
Oil of lavender	1 part.
Alcohol	1·00 ,,

As a typical ammoniacal varnish we may take—

Shellac	8 parts.
Absolute alcohol-ammonia	100 ,,

Other types of cold varnishes are those containing acetone, such as

Zanzibar copal	30 parts,
Amber	5 ,,
Ether	300 ,,
Acetone	200 ,,
Chloroform	20 ,,

or others containing benzine, as suggested by Valenta:—

Sandarac	100 parts.
Benzine	400 ,,
Acetone	400 ,,
Absolute alcohol	200 ,,

Of these the former gives a very much harder film.

IS PHOTOGRAPHY A PLAYED-OUT PROFESSION?

We are indebted for the following remarks to a well-known professional photographer:

This question is so often asked, and so frequently answered, in a dismal affirmative, that a few notes from a "busy man" who thinks professional photography a *good thing*, may make a welcome change.

The "busy man" need not be particularised; he is here, there, and all over the country, and anything but the *rara avis* a recent correspondent to the Journal would have us believe. He can be found in plenty of towns besides the one in a corner of England, but if he is not heard of by all the world and his wife, it is because success tends to make men quieter than the want of it. The voice of wailing is not the only accompaniment to photographic enterprise by a very long way. And who are the men who succeed? Surely the hard workers—men, who, from the start of their career, have realised that professional photography is not a pleasant little hobby to be toyed with, but a downright absorbing pursuit, which needs all the personal tact, good taste, and concentration of business energy that can be thrown into it to ensure success.

The world is full of photographers, but the number of men who appear to be *in earnest* is comparatively few. Is this not even borne out by a cursory glance at professional windows and show-cases?

How many are really up-to-date displays of high-class photography? How many advertise, and how many more discount the workers within?

Yet the show window ought to be a potent influence towards success. The public is ever watchful, it notices instantly a happy pose, a clever example of lighting, an artistic setting of a portrait. It recognises the finer taste which refrains from placarding "Art Studio" in gold letters all over the house front, but which reveals the fact in good portrait studies behind the plate glass. And the plate glass is kept clean—always!

Then the "busy man" at the start showed common sense. He never believed Dame Fortune would arrive through a grubby baize door on the invitation of "Please walk upstairs." He always credited her with a taste for light and pleasant places, and a dislike for dark stairways and mystery. Choosing carefully his position, he thoughtfully expended capital in fitting up an establishment, which, if not remarkable for lavishness was noticeable for its style and regard for the canons of good taste. He remembered the value of first impressions.

The "busy man," as a rule, pins his faith to the educated middle class of society. The exclusive aristocratic connexion may be all very well for a time, but it tires of its pet photographer (either man or woman), or it may be *vice versâ*.

He thinks men and women of the professional and middle walks of life are generally more considerate, easier to please, and the "busy man" is likely to remain so for a longer spell of his active life in their midst than among the restless votaries of fashion ever panting for change.

And, operating in his own studio, the "busy man" is, to a great extent, the arbiter of his business fate.

It is there success is chiefly wooed and won, his technical and artistic skill, courtesy, patience, knowledge of human nature, produce an effect upon his clients just at the time when their nervous impressionability is most highly excited.

He does not devote hours to posing the "good subject," and despatch the less favoured one with more or less perfunctory attention. Good looks and style are the exception, and the foundations of his business must rest upon a broader base than a few fine specimen portraits.

And the children! With them the "busy man" is just in his element. He is once again the schoolboy, and, forgetting his own immediate personal cares, enters with all his early enthusiasm into the art of make-believe. Who shall say the innocent, genuine laughter of the youngsters is not in itself a delightful reward for such efforts? But the man who considers photographing children in the light of a nuisance misses the most interesting phase of studio work, and has probably also forgotten that he who wins their hearts wins more!

Simplicity of pose, naturalness of expression, these qualities are graven on the mind of the busy man as the chief characteristics his photographs *must* bear. However carefully balanced his lighting may be, however good the technical character of the negative, a faulty expression will spoil the whole work. There are operators who worry their subjects by incessant alterations of pose, by constantly experimenting with the blinds, by an uncertain indefinite method of procedure which is disconcerting to their sitters and confusing to themselves.

The majority of sitters in a few minutes of conversation seem to suggest by their own attitudes the most suitable postures for photography, and the cue thus given should be followed out without disclosing to the subject the complete intention in the mind of the operator, and with an entire avoidance of that rough-and-tumble treatment many studio workers are wont to indulge in.

Then the "busy man" taboos the "fuzzy" portrait, for he has found his sitters and their relatives desire the powerful *likeness* which the impressionistic photograph does not give, and, however much he may be interested and amused by the more or less virulent discussions on "High Art Photography," and by the pictorial eccentricities perpetrated under her name, he leaves the task of educating up an apathetic public to men who need not be busy, and who affect to despise the test of commercial success.

And the busy man's studio is innocent of the "patent combination posing chair" and all the other paraphernalia of so-called *photographic* accessories which may still be seen illustrated in a few of the dealer's catalogues. He believes such things belong to a bad period of inartistic sentiment, and he strives to make the studio look as any room in a well-appointed private house might appear.

His backgrounds are remarkable for their extreme softness, for, however distinct he may desire the feature of his portraits to be, the backgrounds are the merest "suggestions," and it is evident he is at pains to pose his sitters a long way in front of the cloth. The majority of his portraits show a simple light and shade, or cloud effect in the backgrounds but, when the painted "scene" is used, there are no water mills, or châteaux, or grand staircase, or fearful and wonderful plants, disputing with his sitters the right of first notice.

And the studio is a comfortable and interesting place to be in, properly warmed and ventilated, and with much to attract the eye and mind from those necessary evils of photography, the camera and the head rest.

Then the retouching! This is a tender subject with the busy operator, and he is sometimes at loggerheads with the retouchers. "Why will they remove so much of the natural modelling he has been at such pains to obtain?" "Why should there be so much destructive instead of constructive, work?" "Why should the features be pencilled down into an intolerable monotony of meaningless smoothness, with a violent light ruled down the nostril?" And he knows they will bring him plenty of resittings unless he personally look over and alter much of the finished work. So with a finely pointed piece of indiarubber he clears the often-filled-up detail under the eyes, and in the wing of the nostril, and puts in the high lights that may have been flattened out, so that his subjects are a little more human, a little more as he remembered them when before the camera.

Then, when the season is over, the "busy man" does not become panic-stricken, and send invitations for free sittings broadcast over the country for an album of medical, or clerical, or legal somebodies (or nobodies!) to prepare for some great society or other. He thinks such a policy suicidal, and only calculated to bring contempt upon professional photographers as a body. Nor does he make up collections of portraits in which by these means he has secured a copyright, and hawk them

round to the public illustrated press. He thinks this is playing professional photography rather low. And he waits a few weeks to see the man who works behind the "grubby baize door," doing the same thing until the whole community is wondering "what is in the wind," and what new "have" those queer photographers are trying to get up.

No! if the fog enshroud the studio, and the public interest in photography seems for the moment to wane, he knows the sun will shine again, and he knows that, until something better takes its place, the demand for portraits will ever increase, since it is created by an intense human need; but in the fierce struggle of life he realises that two things are necessary to keep him a "busy man;" one that he shall make and keep the public respect for his profession, and the other to remember that in all his business troubles *labor omnia vincit*.

HISTORICAL APPARATUS IN THE PHOTOGRAPHIC SECTION OF THE VICTORIAN EXHIBITION AT THE CRYSTAL PALACE.*

The most interesting feature, perhaps, of the Exhibition is the collection of ancient and modern apparatus, which includes some of the very earliest as well as some of the very latest. The contrast is great in many instances—in others not so very great. Some of the old things serve to show that they have since been reinvented, and made the subject of very remunerative patents. When examining some of these old pieces of apparatus, one is forcibly reminded of the old aphorism, "There is nothing new under the sun," or of the Hibernian inventor's ejaculation, "Begorra, those ancients have stolen all my new ideas." *Apropos* of this (though not apparatus), No. 205 is an excellent bas-relief embossed portrait of a lady produced commercially more than twenty years ago. Embossed portraits have formed the subject of several patents during the last year or two.

On entering the Photograph Court one meets the handsome glass case of J. H. Dallmeyer, Limited. It has been arranged by Mr. T. R. Dallmeyer, F.R.A.S., &c., and illustrates the progress of English photographic-lens construction. The earliest lens shown is one of the first Petzval portrait combinations *f*-4, made by Mr. Dallmeyer's late grandfather, Mr. Andrew Ross, about 1850. We have an idea, however, that it must have been made anterior to that date, as it bears no number. The numbering of the lenses, we understand, only commenced after 120 had been issued, and when the late Mr. Thomas Ross took over the photographic lens department; after that, all lenses were numbered. Therefore there is little doubt that this instrument was actually corrected by A. Ross himself. That the lens is one capable of yielding good results is proved by the negative taken with it. With each of the lenses shown, Mr. Dallmeyer has accompanied it with a coloured diagram of the forms of its components, the different colours representing the different glasses used in their construction. A key to the colours is also shown in the case. There is also suspended at the top of the case a negative taken by each of the lenses on a plate the next size larger than that it is designed to cover, so that one has an excellent opportunity of seeing their different capabilities.

Next to the old Ross lens is an original Dallmeyer portrait lens, *f*-3.1 patented by the late Mr. J. H. Dallmeyer in 1866, and next that is the stigmatic *f*-4, by Mr. Aldis (one of the firm) invented 1896, and, completing the portrait series is the J. H. Dallmeyer Petzval with Mr. T. R. Dallmeyer's astigmatic corrector. The accompanying negative shows how completely it eliminates the defects of that form of lens. The group series of lenses commences with the original triplet of 1861. Then we have the original rapid rectilinear *f*-8, and the wide-angle one of *f*-15 (1866). Next, the original Dallmeyer's group lens, also 1866, and lastly, the new stigmatic *f*-6, introduced only this year. The negative taken with this shows that the field is perfectly flat, and free from astigmatism over a very wide angle indeed.

Landscape lenses are historically represented by that introduced by Mr. Dallmeyer's late father, *f*-10, in 1860, by his wide-angle *f*-15 (1865) by Mr. T. R. Dallmeyer's rapid landscape *f*-11 (1884), and by his rectilinear landscape *f*-14 (1887). Lastly, by his original simple tele-photo lens of 1891, and his improvement upon that, 1892, and for which he was awarded the Progress Medal of the Royal Photographic Society. The explanatory way in which this loan is arranged does great credit to Mr. Dallmeyer, as it is made clear and instructive to the most uninitiated in photographic optics.

Messrs. Watson & Son have lent a very early compound lens by Lerebours & Secretan (No. 285), the front combination of which is considerably smaller than the back one. This firm has also lent (No. 283) an early landscape lens by A. Ross. Mr. W. Chipper lends (No. 284) a caloscopic lens by Horne & Thornthwaite, dated about 1858. This is really the orthoscopic lens of Petzval, though under a different name. Mr. Chipper has also lent an early form of lens for portraits and landscapes by Jamin. In this instrument the tubes in which the components are mounted slide one in the other, so that the lenses can be adjusted at different distances apart, and by this means the focus of the combination may be varied. One portion of the tube can be detached and reversed, so that the front combination may be used as a single landscape lens.

In the back of one of the cases is a large lens of the doublet form of something like sixty inches focus. This lens was specially made for the late Mr. Lachlan-McLachlan by Darlot, to reproduce his picture, *The Royal Family at Windsor*, about 1879. The original picture is shown in the Fine Art Section in the Greek Court and one of the small reproductions in the Photographic Section. Comparing the two pictures, it is very evident that the original has undergone a great change since that reproduction was made.

Messrs. Negretti & Zambra show a large condensing lens, about twenty inches in diameter, which at one time formed part of a Woodward's Solar Camera (about 1859), for enlarging direct on albumenised paper by the light of the sun. Some of the large portraits shown in this firm's court, we are told, were made with this instrument. Negretti & Zambra have also lent a reversing prism as used by them for producing non-reversed Daguerreotypes, and a pair of stereoscopic (single) lenses with which a large number of the early views of the Crystal Palace were taken. The same firm have also lent a single landscape lens, of early date, for whole-plate pictures, which will give a very good idea of the impedimenta the outdoor photographer of the past had to be encumbered with. This lens is nearly three and a half inches in diameter, though it was only for whole-plate pictures, and is mounted in heavy brasswork. It is a great contrast to any modern lens for outdoor work, on the same size plate.

In the bottom of the case in which the lenses are shown is a complete set of Daguerreotype apparatus, lent by Mr. L. W. England and by Mr. Jerrard. The iodine and bromine box illustrates how the plates were sensitised. At the bottom of the box are two pans, one for the iodine and the other for the bromine, or bromide of lime. Over these are sliding glass lids that fit over them, airtight, or as nearly airtight as possible. Above these is a set of carriers for the different-size plates, which can be slid backwards and forward over the pans. In sensitising, the silver plate is first placed over the iodine box, and the glass lid withdrawn, and, when the plate has assumed the proper tint, it is slid along over the bromine, and its sliding lid withdrawn until the plate gets its right tint there; then it can again be exposed to the iodine vapour to complete the sensitising, the plate being watched the while through the couple of small doors in the front of the box. The mercury box explains itself. The mercury is placed in the iron receptacle at the bottom, under which is placed a spirit lamp to heat it up to 160° or thereabout, the exposed plate being placed in the sloping carrier some distance above, the development of the image being watched through the small door.

The Daguerreotype exhibit is of special interest, inasmuch as it is the actual apparatus with which the late Mr. W. England did the greater part of his work. The velvet buffs were those used by the late Mr. Claudet, who was one of the last to give up the Daguerreotype process in London. Amongst the Daguerreotype apparatus is a dark slide bearing date 1843. It has no door at the back like the modern dark slide. Behind the sliding shutter is a removable carrier with a rabbet to take the plate; and, hinged to the carrier is a metal lid that shuts over the back of the plate. Such a slide as this would be of no use in modern photography, as it is not light-tight at the back; but that was not necessary, as light could not pass through the Daguerreotype plate. After the exposure had been made, the plate, carrier and all were transferred to the developing box.

Near the above apparatus is a model of the swing front of a camera, lent by Mr. Moorse, by whom it was made for Mr. Mayall, about 1860 or earlier. Mr. Moorse has also lent a portable stereoscopic camera and slides, date 1856. The body of the camera is of wood, which is hinged together so that it folds quite flat for packing. This was one of the earliest forms of portable camera introduced, and, though fairly portable, it was by no means of light weight.

Messrs. Negretti & Zambra have lent an early form of changing box for albumen plates, in which the plates are fitted in carriers which are changed with the plates; also an early stereoscopic camera or dr

* This article was in type before the close of the Exhibition, but was unavoidably held over.

plates, with sliding arrangement for taking the pictures with one lens; and another early stereoscopic camera, a bi-lens one, the lenses of which are fitted with a contrivance by which they are exposed simultaneously. The same firm have also lent a micro-photographic camera and lens, for taking twenty-four minute photographs on a plate $3\frac{1}{4} \times 1\frac{1}{4}$ inches.

Amongst the early stereoscopic cameras is one lent by Mr. Foxlee for wet-collodion plates, and a negative (and print from it) taken with it, in 1858, of Saltash Bridge in course of construction.

Messrs. Morley & Cooper have lent a couple of early "Postage-stamp" cameras (Nos. 369–70). One bears date 1864, and takes nine portraits with one lens (Horne & Thornthwaite) on a plate 3 × 3. The repeating back which enables this to be done is as ingenious as it is simple. The other camera is for taking fifteen portraits with five lenses on a half-plate. This has a repeating front for the three exposures, a part of which, the lower portion, is flexible, like the flexible wooden shutters of some dark slides, and passes down into the base of the camera. This camera was made by George Hare in 1863.

One very interesting piece of apparatus, historically, is that lent by Mr. George Mason. It is the baseboard of a 15 × 15 camera, fitted with a metal turn-table with clamping screw, &c., which was made in 1854. This piece of apparatus, though so old, possesses several advantages over the modern turn-table, as at present constructed, inasmuch as it is rotated by a rack-and-pinion movement. It is also provided with levelling screws so that the camera can be levelled without having to manipulate it from the tripod stand. These are no mean advantages when one is working with cameras beyond the smaller sizes.

Twin lens cameras and metal dark slides are not quite such modern inventions as some think. No. 355 is one—the "Fantaz." In form it is very like a stereoscope, and is for plates $3\frac{1}{4} \times 3\frac{1}{4}$ or lantern size. One side is used as a finder and the other for the picture. Both lenses are manipulated with one pinion. The dark slide is unique, simple, and quite light-tight. The date of this instrument is a little uncertain, but it goes a long time back.

Anent twin lens cameras there is an opera glass camera, lent by Mr. Alfred I. Taylor, from the museum of his late father, Mr. J. Trail Taylor. It was made by Geymet & Alker, and bears date about 1861. It is for glass plates about an inch and half square, and, with it, there is a magazine to carry fifty plates, which, by a very simple arrangement, are transferred to the camera and returned in a strong light with perfect safety. The latest form of twin lens camera shown is one by the Scientific Camera Company (No. 389). It is for dark slides, and of the quarter-plate size, and is the best up-to-date twin lens camera in the Exhibition.

No. 361 is a very interesting exhibit as illustrating reinvention. It is a small magazine hand camera for a dozen plates about an inch and a half square. It was invented by Mr. J. A. Harrison, by whom it is lent, and a ticket on it tells us that it was shown at the Photographic Club in 1881. If we mistake not, it was shown at the original South London Society before that. The camera is of metal, and the simple contrivance by which the plates (which are in frames or sheaths) are pushed from the chamber in which they are placed to that for exposure, and on thence to the one for the exposed plates, is very similar to that in a much more recent invention. Another very important feature of this ingenious little apparatus, as illustrating reinvention, is that it is fitted with a roller-blind shutter. In this there are two rollers, one containing a spring like that in a window blind, fitted with a ratchet and detent. The blind is a piece of mackintosh cloth with an aperture in it as with the ordinary roller-blind shutter.

Not the least interesting things in this section are Nos. 375–6, two roller slides by Mr. Leon Warnerke, dates 1874–1879. These we believe were the original models. Additional interest is attached to these pieces of apparatus, although they are not the first roller slides, inasmuch as Mr. Warnerke was the pioneer of film photography with roller slides, and they antedate the present form of roll-holder by many years. Some early examples of Mr. Warnerke's film negatives (Nos. 268–71) were commented upon in a previous article.

Nos. 371–3, lent by Mrs. Smith, who has contributed largely to the historical collection, are cameras, the invention of the late Mr. George Smith and the late Mr. W. B. Woodbury. One by the latter is the "dispatch box" camera. Two are shown—one open and one closed—and are very complete instruments, and, when closed, would not be at all suspected as being photographic apparatus. The scenograph, invented by the late Mr. Smith about 1877, is wonderfully like a camera of more recent invention.

Early panoramic apparatus is lent by Messrs. Hinton & Co. and by Mr. A. I. Taylor. The former have lent a Sutton's panoramic lens, camera, and dark slide (No. 359). In this apparatus, which was patented by the late Mr. Thos. Sutton in 1859, a curved glass plate, a segment of a cylinder, was used for the negative, the dark slide, of course, being curved to take it. A curved bath was also used for the sensitising of the plate, and curved pressure frames were also necessary for printing from the negatives. The lens (sometimes called the water lens) is composed of two glasses, of deep curves, and the intervening space between them is filled with water, which achromatises the combination. In the centre of the combination is a diaphragm with an oval opening, but two small metal plates are fixed in such a position as to cut off the light, so that, from whatever direction the aperture is observed, it is always seen as a circle and not as an oval. By this arrangement the light becomes equalised all over the plate. This diaphragm was at the time termed the "butterfly stop" on account of its form. A notable point in this lens is that its inner and outer curves are concentric as in the modern lens of that name. In the case of the Sutton lens, the four curved surfaces are concentric, their common centre being a point in the axis of the combination. The angle included by this lens is 100°.

Mr. Taylor's loan is one of Johnson & Harrison's pantoscopic cameras for taking panoramic photographs on flat plates, embracing an angle of 120°, and it was patented by them in 1862. By the way, Mr. Harrison is the same gentleman whose magazine camera has just been referred to. The late Mr. J. R. Johnson was the patentee of several modifications in the carbon process, and, with the late Mr. Winsor, the founder of the original Autotype Fine Art Company. In this pantoscopic apparatus, the camera rotates on a pivot by means of clockwork while the picture is being taken, and at the same time the plate is moved horizontally in the opposite direction, behind a narrow opening through which the image is admitted to it. This is provided with two adjustable zinc plates which allow of the opening being made larger opposite the foreground of the picture, and narrower opposite the sky, so that the light at different portions of the picture can be greatly modified. The rate of rotation of the apparatus is governed by an adjustable fly vane as in a musical box. One of the essentials in a camera of this kind is that the axis of rotation is exactly under the optical centre of the lens. On this apparatus much skill and ingenuity were expended before perfection was achieved, the greater portion of which must be credited to Mr. Harrison. Sutton's apparatus was not used to any great extent, owing to the difficulty of manipulating the curved plates; but the pantoscope was more largely employed. Photographs taken by both these apparatuses, about the time of their introduction, are shown, and, although badly faded, they suffice to illustrate their capabilities. They are Sutton's (No. 216) and Johnson's (Nos. 208–9).

Up to date, and the latest, panoramic apparatus is that of Colonel Stewart, R.E. With this the complete circle can be taken. In principle the apparatus is similar to that of Johnson & Harrison's; but, instead of a glass plate, a rollable film is made to pass across the narrow opening at the back, while the camera, which is also actuated by clockwork, is rotating. This apparatus is numbered 434, and behind it is shown a picture, taken with it, that illustrates what it will accomplish.

Any historical exhibition, photographic or any other, to be really representative, must include not only what is ancient, but also that which is modern, and this is the case with the Photographic Section at the Crystal Palace. In these articles, however, we have only referred in detail to things of ancient historical interest, and it is not necessary to particularise those of present date and well known to all. It is only necessary to mention that up-to-date apparatus is well represented, and most of it is a great contrast with that of the past.

For example, Messrs. Watson & Son have lent one of their Acme cameras, which may be taken as the perfection of modern cameras as regards lightness and portability, coupled with rigidity. Messrs. Adams & Co. have lent a Vesta camera, which may be taken as being the most portable form for small plates; also their "brilliant" view-finder one of the latest inventions in that direction, while Messrs. R. & J. Beck have contributed their Frenas and pictures taken with them. These illustrate the latest thing in film photography with flat films. This firm also show sets of their magnifiers for modifying the foci of their Frena lenses, which is one of the latest novelties. In connexion with film photography, the European Blair Camera Company have lent two or three of their latest cameras for rollable films.

Messrs. Marion & Co. have contributed quite a number of their latest novelties, including Cole's Patent Camera, with flexible rising and falling front, and their Radial Camera; also many other useful items. Not the least useful of recent inventions is Salmon's adjustable vignetter and printing frame. Messrs. Penrose have lent some of their most recent in

entions in connexion with process work; there is their newest camera back or half-tone work, Lévy's ruled screen, and their patent diaphragms. To ring up the Apparatus Section to the very latest date, Mr. Ives has lent his Kromskop. There is also the necessary apparatus for X ray work, and the Cinematograph, contributed by Messrs. Negretti & Zambra.

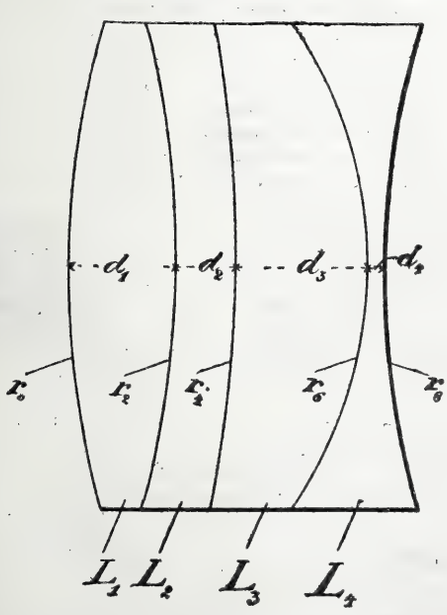
In concluding these articles we can only reiterate what we have said before, namely, that it is the most complete collection of historical photographs and appliances that has ever been got together, and it reflects the greatest credit on its organizers, Messrs. Negretti & Zambra, who have organized it for the Crystal Palace Company.

VOIGTLÄNDER'S IMPROVED LENS.

Messrs. Voigtländer point out that the need for the making of compound photographic lenses has grown in the measure as practical optical science has found ways and means for improving each of the component parts or halves of a double symmetrical photographic objective, so far that it can be advantageously applied for taking photographs without using too small or narrow diaphragms and while avoiding the defects otherwise inherent in single objectives. The quadruple lens combination of Zeiss in this respect is typical, the component elements or halves of which consist each of four lenses with a light power of f-12·5, and which both give a sufficient central sharpness and flatness of the field, and are also, by the limitation of the chromatic difference, distinguished by sufficient correction of the spherical error or aberration outside of the axis.

If the meniscus-shaped collecting lens (the inner lens) of the single lens of the so-called collinear be suitably divided by a section made symmetrically to both of the two outer surfaces of this lens, and if the two parts are made of two kinds of glass, in such manner that the part next to the biconcave lens is made of glass with very low refractive and dispersive power, while the other part (the one next to the biconvex lens) is made of glass with medium refractive and dispersive power, then the construction may, by suitable choice of glass and of curves, be so materially improved without bringing in other defects, that not only the double objectives, but especially the single elements, obtain superior optical effects.

The zones of the spherical aberration are of special importance for the oblique pencils of rays, for it so happens that the slight spherical over-correction of the marginal zone, which is of no significance for the axis,



shows itself more and more towards the margin. The over-correction of the marginal rays, which are especially active for the oblique rays, will, when the astigmatism is quite done away, cause the oblique ray pencils to have no longer sharp points, and, even with comparatively large lens apertures, rays will be found inside of the useful zone which, in extreme cases, do not intersect at all within the image.

The aforesaid division in two parts of the collecting meniscus, when properly effected, allows both of the lessening of the spherical zones for the axis, and also of a better correction of the same defects for oblique rays, and that to so large an extent, that herein alone a considerable technical advance will be found. Moreover, the single halves of this double objective, each half consisting of four lenses, are as stated materially better than the halves of a double objective, each half consisting of three lenses.

In order to show how such a four-partite system may be constructed, reference is made as an example to the accompanying drawing and to the following particulars of the component parts of same.

Kind of glass.	Exponents of refraction.	Radii.	Thickness of lens.
n D	n^1 G		
L^1 1·6079	1·634	r_0= 85·6 mm.	
L_2 1·5366	1·5701	r_2= 88·0	d_1=10·0 mm.
L_3 1·5063	1·5172	r_4=120·0	d_2= 5·8
L_4 1·5366	1·5701	r_6= 70·0	d_3=12·0
		r^8= 82 0	d_4= 1·8

F=557·8 mm.
Aperture 47·0 mm.

The claims are for a spherically, chromatically, and astigmatically corrected photographic single objective, consisting of four lenses cemented together, *viz.*, a biconcave lens of medium refractive power and medium dispersion, in combination with a positive meniscus made of glass of low refractive power and low dispersion, both cemented together and cemented to two other lenses consisting of a meniscus made of glass of medium refractive power and medium dispersion, and a biconvex glass of higher refractive power and higher dispersion, the biconvex lens having the highest,

$$v\left[=\frac{\text{Exponent of refraction}-1}{\text{dispersion.}}\right];$$

and the combination of two four-partite single elements of like or unlike focal lengths, but having a perfect, or nearly perfect, proportional graduation of the indices of refraction and radii for a double objective.

THE RÖNTGEN SOCIETY.

The inaugural meeting and *conversazione* of this Society was held at St. Martin's Town Hall on Friday, November 5. A large and distinguished company of ladies and gentlemen was present, many eminent men of science, whose names are identified with the study of electrical discharge phenomena, being among the visitors. An interesting exhibition of radiographs, and apparatus employed in this branch of work, had been organized, and excited great interest. Among the items on the programme were the Presidential address, by Professor Silvanus Thompson; demonstration with the living body, under Messrs. Moore and Webster, Mr. Webster's twenty-inch spark Apps-Newton coil being used; and demonstrations of various exhaust tubes, by Mr. Isenthal and Dr. Fenton, a ten-inch spark coil and apparatus, lent by the Earl of Crawford, being used.

The exhibition of photographs was organized by Messrs. Snowden Ward and Mackay.

Dr. Gladstone, F.R.S., showed photographs of alkaline and other metals in order of their power of absorbing Röntgen rays (with Mr. Walter Hibbert); Mr. F. H. Neville, M.A., F.R.S., Cambridge, microskiagrams of sections of sodium-gold alloys, showing internal constitution of alloys; Mr. F. C. Abbott, F.R.C.S., some very interesting photographs of bullets and wounds taken at the seat of the recent Greco-Turkish war; Mr. Gifford, early work; Mr. Gardiner, biological and conchological objects; Mr. Griffith Wilkin, skiagrams of ear; Dr. Norris Wolfenden, natural history objects; Dr. Walsh, comparison of bloodless and turgid hands; Dr. Morton (New York) showed a full-length figure taken at a single exposure.

The President showed a new pattern of induction coil, invented by Mr. Nikola Tesla, giving high-frequency oscillatory discharges direct from any ordinary electric supply with small expenditure of energy.

A large collection of apparatus, illustrating recent advances in Röntgen methods, as regards tubes, screens, interrupters, rheostats, and other accessories, were shown at separate tables by the following, amongst others: Messrs. Binko & Co., "Dolphin Contact Breaker," and other apparatus; Mr. A. C. Cossor, tubes of own manufacture; the Electrical Company, screens, tubes, &c.; Messrs. Fuerst Brothers, special Röntgen ray sensitive plates; Lithanode Electrical Storage Company, various batteries; Messrs. Maw, Son, and Thompson, Röntgen apparatus, &c.; Messrs. Miller & Wood, induction coils, Tesla apparatus, &c.; Messrs. Newton & Co., coils, tubes, current meters, &c.; Messrs. Rebman & Co., archives of the Röntgen ray; Mr. W. K. Schall, accelerating screen, motor interrupter, rheostats, actinometer for testing tubes, &c.

The President, in the course of his address, traced the history of Professor Röntgen's great and almost accidental discovery, and the astonishment it created in the scientific world. Professor Röntgen, he announced, also has accepted honorary membership of the new Society. The revival of interest in the science of optics has been extraordinary since the properties of the rays were first made known, and the electrician, the photographer, and more especially the medical profession, seized upon the discovery as a means of investigation of the most astonishing power, revealing in the living body the anatomy which hitherto could only be explored by indirect means. More recently still, the rays have been found to possess electrical and chemical properties, giving scope to the physical investigator and demanding his most acute discrimination. Since, indeed, the discovery of anæsthetics and introduction into surgery by Lord Lister of antiseptics, no discovery has done so much for operative surgery, for it has helped the diagnosis of

fractures and dislocations, the study of bone diseases, and the detection of foreign bodies. As to progress in application, Dr. Macintyre, of Glasgow has succeeded in obtaining a kinematographic record of the movement of the bones, and Mr. Mackenzie Davidson has recently invented a simple and ingenious apparatus by which any intelligent person can localise to the hundredth part of an inch the exact position, say, of a needle in the hand or foot, the complicated geometry of the oblique being simplified to the utmost. The curious effect upon the hair, too, was noted by Professor Thompson, who stated that one of his assistants suffered from a bald patch after skiagraphs of his skull had been taken, and others had lost the short down from hands and arms, and it is doubtful whether the reason of this is a direct effect like sunburn, the action of the oxygen, or an electrical effect. Some persons are more sensitive to this effect than others. The experiments conducted to kill bacteria have so far been quite negative. The experiments in nerve stimulation as to whether the rays offer any hope to the blind are still very uncertain and rather discouraging. Professor Brandes has, however, discovered that the normal eye has a faint perception for the rays, and Dr. Louis Sells, of the John Hopkins University reported a case of a paralysed blind patient, where by the interposition between the pupil and a Crookes' tube of stencil plates minute apertures in the form of letters were perceived; and, though it would appear that the rays hold out no prospect of restoring sight to the blind in general, yet, if only one case in a thousand was so partially successful, the subject is deserving of the fullest investigation.

The latest metallurgical application is to the study of the properties of the alloys of gold. Professor Thompson reviewed the scientific experts' opinions as to the character of the rays, and pointed out that the newly formed Society has a wide field of research before it. He concluded with an appeal to London to found an institute for the study of the physical sciences by which the earnest investigator might hope to succeed in penetrating a little further into the mysteries of the unknown.

THE BRIXTON AND CLAPHAM CAMERA CLUB'S EXHIBITION.

The members of this active photographic Society have every reason to be proud of their Seventh Annual Exhibition, which was held at the Clarence Rooms, Brixton, S.W., from Monday to Saturday in the past week. They are fortunate in being able to obtain a hall which, with taste and ingenuity combined, is capable of being made into a capital gallery for the display of pictures. The taste and ingenuity have been forthcoming, and, although the simple decorations that have been attempted are deficient in those claims to notice in many of the features that have given some recent photographic exhibitions notoriety, they serve well the purpose that such decorations should serve, they show the pictures to advantage.

The Society is quite strong enough to provide for a good Exhibition without outside help, and each successive Exhibition, by its improvement on the last, has shown that the members keep fully abreast with the times; but their Executive certainly did wisely in invoking the assistance of some of the most highly esteemed workers of the day. The Invitation Section consisted of over forty works, contributed by Harold Baker, J. B. B. Wellington, Bernard Alfieri, James A. Sinclair, Arthur Burchett, H. P. Robinson, Karl Greger, J. Craig Annan, George Davison, and William Crooke, and constituted a collection that it was worth a considerable journey to see and study. The works exhibited were not all of recent production; many of them were old favourites, dating from long before the Salon existed or was dreamed of, and we could not avoid the reflection that, with all its boasted influence on photography, how little the Salon has really influenced it. The best features of the work of the Salon are to be found in work done before its birth; the worst features will probably die with its death.

The collection of contributed works was doubtless closely studied by the members of the Society who aspire to fame in the pictorial branch of photography, and particularly those who have not emancipated themselves from the thraldom of the glazed chloride print.

Among these we notice there are some who have passed the "junior's-work" stage; but, taking the members' work as a whole, we have little but praise to bestow upon it. It is certainly in advance of that of last year in every respect. Several of the members have already achieved successes outside their own Society, and their work here exhibited shows that they were deserved. Perhaps, in some cases, the desire to make the Exhibition a success in point of number of exhibits has led to the weakening of the average quality on the part of some of the exhibitors, but this is a venial and pardonable offence, and the small injury it does is to the exhibitor himself.

The Judges were Messrs. F. P. Cembrano, J. Gale, and E. J. Wall. Their decisions will probably be endorsed even by those who were passed over. Mr. John Gunston's silver medal for the best collective exhibit, consisting of sixteen pictures, was obviously well placed. We think Mr. Gunston would have done wisely in somewhat restraining the display of his versatility with regard to subject and style, but even in his worst exhibit there were many commendable points. Mr. F. W. Levett's seven exhibits were remarkably even in quality, careful, and showing considerable feeling and appreciation of how to treat the subject. A bronze medal was awarded for his collective exhibit. Mr. E. Dockree receives a silver medal for the best print not included in a medalled collective exhibit. His picture, *An Old Highway*, could hardly be called an architectural subject, though it consisted mainly of buildings. It was an admirable piece of technical work with considerable pictorial merit. The bronze medal for the second best print not included in a medalled collective exhibit was awarded to Mr. F. P. Smith for a purely architectural subject, *The Chapter House, Lincoln Cathedral*, which was good both in technique and treatment. His other exhibits show promise.

The prize in the Junior Members' Class was awarded to Mr. W. W. Redman for *Among the Birches*. If Mr. Redman will study what not to do a little, he may come to the front.

The lantern entertainments held on each evening were by Messrs. J. I. Lyell, E. J. Wall, W. F. Fenton-Jones, J. Gunston, and E. Dockree. Animated photographs were shown, demonstrations of X rays given and other entertainments of a scientific character were provided for the amusement and instruction of visitors, and we must not omit to mention the trade exhibits of the Prosser-Roberts Drug Stores, Messrs. R. & J. Beck, and Lonsdale Bros.

Our Editorial Table.

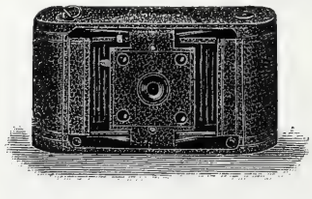
We have received the *British Astronomical Weather Almanac and Chart* for 1898, by B. G. Jenkins, F.R.A.S. It is designed for the use of landed proprietors, farmers, gardeners, sailors, fishermen and the public generally.

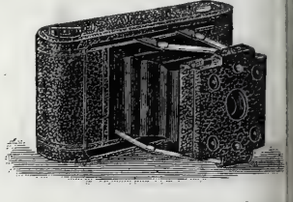
Kodak Works is the title of a pamphlet issued by the Eastman Kodak Co., of Rochester, New York, which gives twenty-four large illustrations in half-tone of the Company's manufacturing premises in America and England, and views of the various offices in London, Paris, Berlin. The pictures of the machinery shops afford one a good idea of the vast amount of ingenuity brought to bear in film-camera design and construction.

The Folding Pocket Kodak.

The Eastman Photographic Materials Company, 115, Oxford-street, W.

One of the features of the Eastman Photographic Exhibition was the Company's latest introduction in cameras for film photography—a folding pocket Kodak, an extremely portable and ingenious little instrument. Whilst giving a picture $3\frac{1}{4} \times 2\frac{1}{4}$ inches, it is so constructed as to go easily in almost any pocket. When closed, it measures only $1\frac{5}{8}$ inches in thickness, and is flat like a book. It is quickly brought into action, and as quickly closed for the pocket. These movements are performed in an instant. The front springs out into position with a touch, and, when the exposure has been made, the camera is closed so readily that all the advantages of the





folding pattern camera are attained without any inconvenience. The lens is fitted with three stops. The shutter is always set, and the instantaneous exposures are made by touching a lever at the top of the camera front. For time exposures a separate lever is actuated. There is thus no separate movement required to prepare for time exposures, and no danger of the time arrangement being left in action when instantaneous exposures are intended. For inserting the roll of twelve films, the camera divides into two parts without any unfastening of catches, the separating and the fitting together being neat and easy. The cartridges are placed and secured in position by a new and simple device. There are two finders, for vertical and horizontal views; and a brass sliding foot for steadying the camera upon the table or stand for time exposures.

Bibliography of X-ray Literature and Research.

By C. E. S. Phillips. The *Electrician* Printing and Publishing Company, 1, 2, and 3, Salisbury-court, Fleet-street, E.C.

Mr. Phillips's compilation is a useful addition to the number of books called into existence by the publication of Professor Röntgen's discovery of the X rays, not quite two years ago. Opening with

historical retrospect of work done with electrical discharges in vacua since the year 1650, a series of terse and useful hints to students about to turn their attention to high vacua research is next given. The bibliography occupies nearly seventy pages, and the principal scientific periodicals appear to have been availed of in the compilation. As a work of reference for those taking up a course of experiments in radiography, Mr. Phillips's book should be exceedingly useful.

Die Kunst in der Photographie.

Julius Becker, Berlin.

The fourth number of this excellent publication has reached us. It is devoted to the Association Belge de Photographie, and gives six photogravures and various process prints of high quality, representing works by leading members of the Association. Probably *The Dusty Road* (by Léonhard Misonne), *Autumn Mist* (by R. Jckx), and *A Mother's Sufferings* (by Désiré D clercq), will appeal most to English photographic students. The last-named picture is one of very high merit. Mr. Marcel Vanderkindere, the General Secretary of the Association, gives a very interesting account of the progress of amateur photography in Belgium, and the struggle in which the Association has apparently been engaged to obtain recognition of photography as an art. The Association seems to have gained considerably by his tact and skill.

The "Excelsior" Plate.

B. J. Edwards & Co., The Grove, Hackney, N.E.

Messrs. Edwards have recently put on the market, under the name of "The Excelsior," at popular prices, a very rapid unbacked plate. During the recent dull weather, which has succeeded the fine autumnal visitation with which these islands were lately favoured, we had an opportunity of testing the plates on indoor portrait subjects. They were rapid enough to enable the exposures to be cut down to a few seconds at *f*-11, and they thus appear to be well adapted for studio and portrait work. The plates, like all Messrs. Edwards's productions, are carefully made, and give a fine grainless deposit with perfect half-tones. The Excelsior plate should have great popularity for all-round work.

Ortol-Hauff.

Furst Bros., 17 Philpot-lane, E.C.

Since last week we have had an opportunity of developing some plates with the newly introduced reducing agent, Ortol-Hauff, working according to the formula given on page 715. Ortol is sent out in the form of a fine, impalpable, pinkish-white powder. It dissolves easily in the metabisulphite solution recommended by the makers. We used the developer without bromide, and found that it behaved differently to others of the newer reducing agents, in that it appeared to have no tendency to bring out the image instantaneously. On the other hand, it struck us as deliberate in its action, the lights and shadows of the negative appearing in their proper order, thus reminding one of pyro. Ortol yields soft and extremely well-gradationed negatives, and apparently has great power of searching out detail. Further experience may confirm our observation that it will be specially useful for briefly exposed plates. It is certainly a pleasant developer to use.

News and Notes.

Royal Photographic Society.—Photo-mechnical Meeting, Tuesday, November 16, at 12, Hanover-square, at eight p.m. *A Review of Triple Printing Methods*, by E. Sanger Shepherd.

Photographic Club.—Wednesday evening, November 17, at eight o'clock. *A few Notes on some of the Historical Photographic Exhibits shown at the recent Crystal Palace Exhibition*, by Mr. E. W. Foxlee.

Mr. Ives's new photo-chromoscope for use with the optical lantern, showing plain photographs on the screen in their natural colours, will, we understand, be placed on the market in a week or two by Messrs. Newton & Co., of 3 Fleet-street. This instrument shows admirably with a simple limelight jet or an electric arc lamp.

Dulwich Photographic Society.—This Society will hold an exhibition of photographs at Dulwich Constitutional Hall on Friday and Saturday, January 14 and 15, at which there will be a class open to exhibitors who are not members. Entrance fee is 2*s.* 6*d.* for open class, which may be sent to the Hon. Secretary, Mr. F. J. W. Pope, 3, Burnaston-terrace, Grove-vale, East Dulwich, who will be pleased to give any information on the subject.

Photographing Wild Birds at Roost.—We understand that the Brothers Kearton have succeeded, by means of the magnesium flash, in photographing wild birds at roost, moths feeding, &c., and examples of this novel application of the camera will appear in their forthcoming new book, *With Nature and a Camera* (Cassell), which will contain an account of their adventures, observations, and experiences, and be illustrated with no less than 160 pictures.

Mr. T. C. Porter, M.A. (the President of the Eton College Photographic Society), asks us to state that the annual exhibition of the work of members of the Society will be open to the public, without fee of any kind, in the Upper School, on Tuesday, November 30, from 10 a.m. till sunset. The Society will be glad to see any visitors who may wish to see the Exhibition. The exhibits are all the unassisted work of members of the Society, most of them present Etonians.

Hana's Studios, Limited.—This Company has been registered by Keddey & Co., of 8, Fenchurch street, London, E.C., with a capital of 7000*l.*, in 1*l.* shares. The objects of the Company are to acquire and take over, as a going concern, and carry on the business of a photographer and portrait-painter carried on by G. Hana, at 443, Strand, W.C. The first directors, to number not less than two nor more than three, are G. Hana and J. Balbeck. Remuneration as the Company may decide.

North Middlesex Photographic Society.—The Ninth Annual Exhibition of Members' Work will be held at Jubilee House, Hornsey-road (near Hornsey-road Station, Midland Railway), on Tuesday, November 30, and Wednesday, December 1. The Exhibition will be open each evening at seven p.m. In addition to the exhibition of photographs, there will be optical lantern displays as follows:—On Tuesday, November 30, at nine p.m., the lantern slides entered for competition will be shown. On Wednesday, December 1, at 7.30 p.m., Mr. John A. Hodges, F.R.P.S., will deliver a lecture entitled *Some Beauty Spots of England and Wales*, which will be illustrated by numerous slides. Tickets, price sixpence each, may be obtained of the Hon. Secretary, Mr. W. Taylor, 38, Palace-road, Hornsey, or of any of the members.

The Clergy and the Photographer.—At the Chichester Diocesan Conference on the 4th inst., under the presidency of the Bishop of Chichester, his Lordship said he had to bring before the Conference the subject of their being photographed. A letter had been received from a photographer, who wrote:—"Many months we received permission from the Hon. Secretaries of the Conference to take a commemorative photograph of the members attending, and they had gone to very great expense in having a platform erected at the back of the Town Hall, away from the wind. Mr. Davenport now tells us that the photograph will not be required, as his Lordship does not care to be taken. The photographing would not take more than ten minutes altogether." The time fixed for the photographing was 12.45, and he would take a show of hands as to whether they would adjourn the sitting to have themselves photographed. As none of the members wished to be photographed, his Lordship handed the letter to the Hon. Secretary, and told him to take the letter to the photographer and settle it.

The Kingston-on-Thames and District Society met at the Sun Hotel on November 3, to discuss the very excellent dinner provided on the occasion of the Annual General Meeting. Nearly forty members and guests sat down to table, the largest gathering of the Club hitherto. The menu, drawn up by Mr. East in a very humorous vein, was a source of amusement, and at once placed the company at its ease. Business matters were discussed after the dinner, and the officers, with the exception of Dr. Luscombe, whom excessive work compelled to resign, were re-elected; Mr. E. A. Smith fills the vacancy on the committee caused by Dr. Luscombe's retirement. The appointment of Mr. Armfelt as joint Secretary with Mr. East, in place of Dr. Finny, was confirmed, and the well-deserved elevation of the latter gentleman to the vice-presidency was hailed with acclamation. The President (Rev. A. Swinnerton), who was in the chair, paid high and well-merited compliments to the Senior Secretary, Mr. East, and the former Secretary, Dr. Finny, who was practically the founder of the Club. Reports and balance-sheet were adopted, and the Club shown to be in a better position than ever before. After the business and several toasts the company was entertained by some well-rendered songs by Miss Matthews and Mr. Ivering. On the whole, a most enjoyable evening was spent.

The Photography of Faint Moving Celestial Objects.—An ingenious but simple method of photographing unseen or very faint moving but known celestial objects has recently been suggested by Prof. Barnard (*Astr. Nachr.* No. 3453). Every one knows, that in order to photograph a faint celestial object, it is only necessary to prolong the exposure until a sufficiently burnt-out image is recorded on the photographic plate. If, however, the object has a rapid motion, then the image will not remain on one part of the plate a sufficiently long time to record its impression, since the clockwork of the instrument is regulated to counterbalance the apparent motion of the stars. Professor Barnard's idea is to use, in the eyepiece of the guiding telescope for following the object in question, two guiding cross-wires attached to a light frame which can be moved by a delicate clockwork (the works of an ordinary watch are sufficient), the speed of which can be regulated to the motion of the object. Arrangements can also be made that its direction of motion can be regulated to any position angle. When adjusted to the eye end of the guiding telescope, the instrument is set so that the amount and direction of motion of the cross wires shall coincide with that of the comet or minor planet. A star in the field of view is then bisected by the cross wires, and the mechanism set in operation, the star being kept bisected by the ordinary slow motions for star-guiding. It will thus be seen that, although the operation is exactly the same as if the star itself were being photographed, it is the image of the comet which will remain stationary as regards the photographic plate, while the stars will produce trails. Professor Barnard mentions that the device will be very serviceable for photographing visible comets with ill defined nuclei, as these have no definite points to guide by, and it is for this work that he is going to have an instrument of this kind made.—*Nature.*

ANOTHER CINEMATOGRAPH EXPLOSION.—During an entertainment with a cinematograph in the Temperance Hall, Guisborough, on Friday night, an explosion of compressed gas occurred, causing a considerable amount of alarm among the audience, who at once began to make *en masse* for the doors. The apparatus then caught fire, and the flames added a still more serious aspect to the situation. In endeavouring to extinguish the fire, Mr. Curran, who was operating the machine, had his hands and arms severely burnt, but no one else was injured, although the machine was very much damaged.

THE RÖNTGEN RAYS.—Dr. E. Bock suggests in *Memorabilien* for February, that if letters are painted on a sheet of cardboard, afterwards varnished and dusted with powdered metal, or if the letters are made as gold leaf is applied, the Röntgen rays will throw their shadow through the opaque cornea of a blind; and if, the optic nerve is still sound, the blind person will see the shadowgraph thrown on the retina. He urges experts to experiment in this line with persons who have lost their sight from opacity of the cornea, &c., and quotes Professor Eder, of Vienna, as authority for its feasibility.—*British and Colonial Druggist.*

HACKNEY PHOTOGRAPHIC SOCIETY.—Mr. John H. Gear, F.R.P.S., will deliver a course of six lectures at the Pembury Hotel, Amhurst-road, as follows:—Tuesday, November 23, *Lantern Slides;* Tuesday, November 30, *Carbon Process;* Tuesday, December 7, *Enlarged Negative making;* Tuesday, December 14, *Enlargements;* Tuesday, December 21, *Architecture* (*interiors*); Tuesday, December 28, *Negative-making.* The operations involved in these lectures will be practically demonstrated. The chair will be taken at eight p.m. punctually. The lectures are free to members and to friends introduced by members. Further information respecting the Society may be obtained of the Hon. Secretary (Mr. W. Fenton-Jones), 12, King Edward-road, Hackney.

THE following is the programme of the Cinematograph and Optical Lantern Exhibition, given before the Queen at Balmoral Castle, on Monday, October 25, by Messrs. Walker & Co., of Aberdeen:—Her Majesty's Diamond Jubilee—Celebrations in London: the Arrival at Buckingham Palace; Life Guards and Mounted Band of Dragoons; Royal Horse Artillery; Naval Brigade; Her Majesty's Carriage; Colonial Troops. Gordon Highlanders, Castlehill Barracks, Aberdeen—Bayonet Exercise and Volley Firing. Gordon Highlanders leaving Maryhill Barracks, Glasgow. Metropolitan Fire Brigade Scene—Off to the Fire. A Morning Dip—Cavalry crossing a River. At the Zoo—Feeding an Elephant. Children's Fresh Air Fund—2000 Aberdeen Poor Children marching to Station. The Haunted Castle (humorous). Diamond Jubilee Celebrations—Aberdeen. Union-street, Aberdeen—A Busy Scene. Her Majesty the Queen's Arrival at Ballater—the Royal Guard of Honour, the Royal Scots and Deeside Highlanders. At the Braemar Gathering—March Past of the Clans; a Highland Reel. Train—Arrival at Station. Scene with the Gardener in a Pleasure Park. Near Union Bridge, Aberdeen. Snowballing and Bicycle Spill. At the Pantomime. Clowns—the Long and the Short of it. The Conjurer. Artist sketching Portrait of Her Majesty the Queen.

THE ART OF PHOTOGRAPHING WOMEN.—In the November number of the *Windsor Magazine*, Madame Garet-Charles expresses her views on the subject of modern photography. "As a rule," she says, "a woman prefers to be photographed by women. You see a strong morning light is horribly realistic; it shows up one's little deficiencies so, or it accentuates the beginnings of a wrinkle here and a crow's foot there. Now, every woman, be she of the new or old variety, likes to feel that she is being seen to the best advantage—in the presence of man. Therefore, when she is posed by a critical male, who notes all her little weaknesses of complexion or feature, she feels ill at ease, she loses whatever of naturalness she has, and as a consequence the resulting picture (save the mark!) is more suited to a chamber of horrors than to a Regent-street show-case. "And more, what does the average photographer know of his sitter? And knowing little or nothing of his subject, how can he make a faithful picture? I never take any one at the first interview. I like to have my sitters all to myself for a quiet half-hour—over afternoon tea, for preference—so that I can pick out their best features, their best side, their most natural pose. Then, when they are gone, I turn over in my mind the collection of facts I have gathered, and I fix definitely what I am to do when they return to face the deadly lens. "Heaps of times ladies have said to me when they were going away after having sat, 'How quickly you work! It must be delightfully easy work!' They know nothing of the mental labour that went to make the actual sitting easy and swift."

Patent News.

THE following applications for Patents were made between October 27 and November 3, 1897:—

DEVELOPING DISHES.—No. 24,801. "Improved Developing Dish for Photographic Purposes." Complete specification. E. NOLLEMBERG.

DEVELOPING.—No. 24,831. "Improvements in or relating to Apparatus for Exposing, Developing, and similarly treating Photographic Plates and the like." Communicated by E. Rimailho. A. J. BOULT.

PHOTOGRAPHIC IMPROVEMENTS.—No. 24,763. "Improvements in or relating to Photography." W. H. FELLOWS.

FLASHLIGHT.—No. 24,926. "Improvements in Flashlighting Apparatus for use in Photography." P. BOYER.

FILMS.—No. 24,942. "Method of and means for Obviating Marginal Cloudiness in Photographic Pictures on Films." T. RAAB.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
15	Bradford Photo. Society	Lecture and Demonstration on Photo Ceramics. P. Elliff.
15	Ealing	*Enlarging.* A. Richardson.
15	North Middlesex	*P.O.P. Toning.* E. R. Mattocks.
15	Richmond	Lantern Evening.
15	South London	Competition: Excursion Slides and Pictures.
15	Stafford Photo. Society	Methods of Intensification. W. H. Rostance and Members.
16	Aintree	*Composition.* C. H. Adkins.
16	Birmingham Photo. Society	Demonstration on Carbon Printing. W. T. Greatbatch and P. T. Deakin.
16	Brixton and Clapham	*Recent Advances in Photography.* T. C. Hepworth.
16	Gospel Oak	*Enlarging without Lantern or Condenser.* C. Stone.
16	Hackney	Annual Exhibition.
16	Leeds Photo. Society	1897 *Lantern Slides.* Godfrey Bingley.
16	Royal Photographic Society	*A Review of Triple printing Methods.* E. Sanger Shepherd.
17	Borough Polytechnic	*Hand-camera Work.* W. Thomas, R.P.S.
17	Coventry and Midland	Prize Slides.
17	Croydon Camera Club	Lantern Night.
17	Kingston-on-Thames	Beginners' Night: *Printing and Toning.*
17	Leeds Camera Club	Beginners' Night: III. *Development.* C. C. Vevers.
17	Leytonstone	Lantern Evening.
17	Photographic Club	*A Few Notes on some of the Historical Exhibits shown at the recent Crystal Palace Exhibition.* E. W. Foxlee.
17	Southport	Annual General Meeting.—P.O.P. and Platino Print Competitions.
18	Bolton Mutual Photo. Society	*Cloud Photography.* A. Horsley Hinton.
18	Leigh	Demonstration of the Infallible Hand Camera. Mr. McKellan.
18	Liverpool Amateur	Auction of Photographic Goods.
18	London and Provincial	*Two Men, One Boat, and Three Cameras up the Thames.* Walter D. Welford and W. R. Stretton.
18	Manchester Amateur	*Lantern Slides on Gelatino-bromide Plates.* W. A. Hepburn.
18	Woodford	*Printing.* W. H. Bennett, F.R.P.S.
19	Birmingham Photo. Society	*Wanderings in South America.* F. Sternberg, F.R.G.S.
19	Borough Polytechnic	Lantern Evening.
19	Croydon Microscopical	Affiliation Lecture: *Pictorial Photography.*

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 9,—Ordinary Meeting,—the Right Hon. the Earl of Crawford, K.T. (President), in the chair.

Thirty-three new members were elected.

A DAGUERRE RELIC.

Mr. FRANK HAES asked the Society's acceptance of a holograph letter of Daguerre. He explained that in 1840 the late Sir Moses Montefiore, being about to proceed to Damascus, thought it desirable that his private Secretary should study Daguerreotype at the hands of Daguerre, and the letter in question formed part of a correspondence upon the subject. Mr. Haes saw the document in 1848, in the possession of a friend, whose widow handed it over to him two or three years ago; its authenticity had been established by Professor Stebbing, who had found the caligraphy identical with that of known specimens of Daguerre's handwriting.

The PRESIDENT cordially thanked Mr. Haes for his valuable gift.

THE SPECTROSCOPE.

Mr. E. W. MAUNDER, F.R.A.S., lectured upon the *Spectroscope.* From the earliest days of mankind, he said, the rainbow had presented the clue to a knowledge of the substances which make up the orbs of heaven; mankind had been in the position of explorers who may have come across some great statue half buried in the sands of Egypt or Assyria, and who wondered at its beauty, but did nothing until other explorers cleared away the sand from its base, and others found an inscription upon it, and others found a key to the inscription, when it was discovered to be a record of some bygone race. So had it been with the knowledge of the constitution of the heavenly bodies. The rainbow was the beautiful statue, Newton began to clear the sand away, a hundred years later the inscription was laid bare, and some forty years ago that inscription began to be deciphered. The lecturer, in a most interesting and graphic manner, summarised the experiments of Newton, the invention of the spectroscope, the investigations and discoveries of Fraunhofer and Kirchoff, and referred particularly to the work of Mr. Higgs, a watchmaker of Liverpool, who had photographed the solar spectrum with rare beauty and exactitude. The method of determining the constitution, movements, weight, age, &c., of celestial bodies was fully explained, as were also the characteristics of the spectra of hydrogen, sodium, calcium, helium, carbon, &c. The fact was emphasised that the evidence afforded by the spectroscope of the identity of an element, say, in the sun and the earth, is much greater than that which could be afforded by chemical analysis. If it were possible for some inhabitant of the sun to visit the earth, and to bring with him a piece of iron for analysis, the chemist might weigh it, ascertain its specific gravity, find it possessed certain properties, test it with various reagents, and say that its properties were the same as those of terrestial iron, and that therefore it was iron. But all these things might be considered external to the element, and the spectroscope went further still and revealed

very soul of the element. It showed, for instance, that, whether a vacuum tube in a terrestrial laboratory, or in the sun, or in Vega, or us, or Uranus, the molecules of hydrogen vibrate in just the same length ime, and have just the same movement. It had even been gravely sug- ted that the true unit of time is not the rotation of the earth on its axis, the revolution of the earth round the sun, but the time in which the ms of hydrogen vibrate to and fro. Further, the spectroscope had brought the wonderful rhythm with which the elements vibrate, and the solution he secret of that rhythm was apparently not far off. The old philosophers d to speak of "the music of the spheres," and Lorenzo, in a beautiful sage in *The Merchant of Venice*, said:—

> "Look how the floor of heaven
> Is thick inlaid with patines of bright gold;
> There's not the smallest orb, which thou behold'st,
> But in his motion like an angel sings,
> Still quiring to the young-eyed cherubims:
> Such harmony is in immortal souls;
> But, whilst this muddy vesture of decay
> Doth grossly close it in, we cannot hear it."

was true that no sound came from "the floor of heaven," but vibrations of ht, more subtle and swift than sound, do reach us, and form one great rmony, and the song which they join to sing is one of unity; they tell that ey are bound by one law, the law of gravitation; that they are all animated one life, that type of molecular motion which we call heat; and that they rm part of one great *Kosmos*, one great structure, one great building, the orkmanship of one great Hand, the design of one Almighty Mind.

A vote of thanks was passed, with loud applause, to Mr. Maunder for his cture, no discussion taking place.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OVEMBER 4,—Mr. R. P. Drage in the chair.

Mr. H. C. Rapson showed a somewhat curious sample of halation. As a le, one expects to find halation, in the case of dark objects, against the sky outdoor work, and in interior work in the presence of windows. In the resent case, a photograph of an interior, there were no windows in the picture t all, but the sun was shining through a window on some of the figures. hese figures were very much halated, but where the sun shone upon the wall o sign of halation was to be seen. The plate certainly was an unbacked late, and received half a minute's exposure; but, on the other hand, the plate vas so badly affected by the halation that it was useless. The brand of plate vas named, and considerable surprise expressed that such a plate should suffer o the extent shown.

Plate-speed Testing.

Mr. T. E. H. Bullen addressed the meeting on the subject of testing the speed and quality of plates. To secure a perfect negative, he said, an almost, f not absolutely, correct exposure was necessary. What this exposure was to be depended upon a knowledge of the speed of the plate in conjunction with a knowledge also of the actinic power of the light with which the photographer was working, and of the latitude of the plate to be used. Did the present markings of the speed numbers issued with each box of plates, he asked, convey true information on this point? No. Some of the plates were marked according to Hurter & Driffield's principle; and it was not of their method he complained, but he did object to the serious abuse of their system. It was very generally admitted that the several makers' markings were not relatively in agreement, and, in view of these misleading statements, if he could suggest a means by which each photographer could personally test his plates for himself in a practical manner, it would be deserving of attention. The Hurter & Driffield system was invaluable, in that it mapped out the exact curve of any plate, telling us all about it, and showing where we were wrong and where right. An important thing was the development factor; knowing this and the speed of the plate, you have all the control in your hands. The next thing was to find out the power of the light, and photographers ought to welcome any instrument capable of measuring this at the time of the exposure. Reference was made to the exposure tables published at different times, but they were not to be depended upon, the light being in the habit of varying to a large extent within a very short space of time, so as to utterly upset such calculations. Compared with the outdoor worker, Mr. Bullen thought the professional photographer working in his studio a fortunate man. Studio subjects varied less than did outdoor subjects, and his conditions were more favourable. He described how he was led to adopt the exposure meter in his work, and how his opinion of these instruments had changed since he had made use of them. His chief point was that it would well repay the purchaser of a few dozen plates to waste four of them in tests. At this small expense he earned all that was possible of the capabilities of the plate. His method of procedure was to take four plates, and, using either Watkins's or Wynne's meter, expose each in the camera for a second, varying the amount of exposure to each by the alteration of the lens stop. To ensure accuracy in exposing the plate, he used a metronome which was fairly correct, setting it to half-seconds. As a result of this he had four negatives, from which he could pick that showing the correct exposure and the speed of the plate, knowing which, he could expose any number of plates and be sure of getting them correctly exposed. Examples of the tests were passed round. The first four were exposed as above and developed together, all being removed when one of them was finished. In the second batch an attempt was made to equalise the results of the varying exposures by developing singly, and with considerable success. Prints accompanied the negatives for comparison. All the plates were of the same speed.

Mr. Rapson concurred with the lecturer on the value of the exposure meter, and mentioned a case in which the required exposure varied as much as sixty seconds in three minutes. He remarked that the relative exposures for that day and the day before were as thirty-two to seven seconds.

Mr. R. Beckett, referring to the observation that the Hurter & Driffield numbers as at present marked were unreliable, said at one time photographers had nothing of this sort at all, and he hoped it was not suggested that they were in a worse position now than without them. He should also like to know how much plates varied from their marked numbers. As regards the assertion that plates were over-marked, he did not believe it was to the interests of makers to make all their plates specially rapid. Personally he liked a slow plate for several reasons. As regards the special advantage enjoyed in studio work, he would say that the light varied considerably. Within two hours he had known it to do so between one and ten. So far from being ashamed to use exposure meters, he thought it something to be proud of, and was glad to notice the growing use of these instruments.

Mr. Bullen still thought that the present loose system of marking speeds, will all due deference to Messrs. Hurter & Driffield's investigations, made matters worse.

Mr. Mayall, who had been behind the scenes in some of the first studios in London, mentioned a particular case in which two operators agreed that plates marked 135 were quicker than some marked 170.

Mr. Beckett did not think this variation could be fatal, and would be satisfied with plates varying only a quarter. Over an exposure of four seconds this would only mean an error of one second, and results were on the table varying as one to four.

PHOTOGRAPHIC CLUB.

Annual Meeting, November 3,—Mr. Frank Haes in the chair.

The Hon. Secretary's report having been read, the election of officers was proceeded with, and resulted as follows, those with an asterisk being re-elections. *Trustees:* Messrs. *Frank Haes and *A. Cowan.—*Committee:* Messrs. *E. Crofton, *R. P. Drage, *E. W. Foxlee, *A. Mackie, Hans Muller, *E. A. Newell, W. R. Stretton, and *J. R. Williams.—*Lantern Committee:* Messrs. Bridgman, Mason, and *Stretton.—*Recorder:* (left in hands of the Committee).—*Curator and Librarian:* *Mr. Chas. Wallis. *Hon. Secretary and Treasurer:* *Mr. F. A. Bridge.

A very cordial vote of thanks to the various officers was proposed by Mr. Thomas Bedding, who referred at some length to the work done by the different gentlemen, and this was replied to by Messrs. Haes, Fry, Welford, Stretton, and Bridge.

Hackney Photographic Society.—November 2, the President (Major Woolmer Williams) in the chair.—The Hon. Secretary reported the progress of the Exhibition arrangements. There was every prospect of a success. The entries had exceeded those of previous years; among the names of many who had promised to exhibit were those of Messrs. C. H. Oakden, J. C. S. Mummery, Howard Esler, G. Lafayette, J. Bulbeck, J. H. Gear, C. Job, P. Everitt, J. Stuart, P. S. Lankester, E. Dockree, W. J. Byrne, J. H. Avery, &c. The competition excursion work for August and September was shown. This completing the competition, the Excursion Secretary was able to announce the final positions of the competitors. The winners were as follows: first, Mr. W. A. J. Hensler; second, Mr. J. J. Westcott; and, third, Mr. W. Selfe. The rest of the evening was given to testing members' lantern slides.

North Middlesex Photographic Society.—November 1, Mr. H. Smith in the chair.—The Ninth Lantern Slide Competition took place, and some very good quality slides were shown. Mr. A. Whisett proved the winner, and Mr. A. L. Tyler came out second. Slides by Messrs. Mattocks, Bishop, Stuart, Crane, and Pither, were in addition added to the Society's collection. In the Hampstead Outing Competition Mr. Smith was placed first, and Mr. Pring second.

November 8.—Mr. J. S. Churchward delivered a lecture, entitled

Light and Colour,

to a large number of members and friends, among whom were many ladies. The lecture was extremely interesting, and many slides were shown, which illustrated the refraction and reflection of light and the blending of colours. To illustrate how many different tints could be obtained from the three primary colours, the lecturer showed a recent invention of his, which consisted of two discs of coloured segments, blue, yellow, and red, with the intermediate colours, violet, indigo, green, and orange, which revolved in opposite directions, producing an extraordinary number of shades of colour. As the lecturer had to leave immediately at the close of the lecture, there was no discussion, but a hearty vote of thanks was passed, and conveyed to the lecturer by letter.

Richmond Camera Club.—Monday, November 1, was a Lantern Evening for members' slides. Mr. Purcell presided, and slides were shown by Messrs. Wilson, Purcell, Stone, James, Neville, Child, Gibson, and others. Mr. Purcell's Spanish views, including the Escurial, Alhambra, &c., and Mr. Gibson's Scotch scenery were specially admired. A vote of condolence with H.H. the Duke of Teck, as Patron of the Club, was passed.

South London Photographic Society.—In lecturing before the South London Photographic Society, on

Photographing Minute Objects,

Mr. Freshwater, F.R.M.S., said that for the majority of objects it was not necessary to employ expensive apparatus. The simplest method of working was to use an ordinary microscope, preferably supplied with substage adjustments and a long extension camera. This was sufficient for most work. For illumination, oil, gas, or limelight, could be used, and, in regulating the light, it was necessary that the bull's-eye should be equally lighted all over. The most expensive forms of apparatus were only necessary when very high-power work had to be done, such as the photographing of the fine diatoms, bacteria, &c. With reference to the lenses, he said that the Germans had made the best, but that the English makers were waking up and making lenses quite as good and no more expensive. When preparing for work the whole of the apparatus was fastened to a long, flat board and accurately centered. For focussing, the ordinary ground glass would only answer on arriving at an approximate focus. When that had been obtained, the ground-glass screen was taken out and a thin plate-glass one, ruled with lines one-tenth of an inch apart, substituted, and the critical focus was obtained by the use of an eyepiece. Coloured screens were sometimes useful for modifying the colour of

the object photographed, and signal-green, bluish-green, and yellow were given as examples. Limelight was purer for use, and he recommended the Pringle cut-off on the jet as a means of economising the oxygen. No fixed rule for exposure could be given, owing to the colour and thickness of the subject and the amount of magnification. Limelight, using a one-inch objective on a blowfly's tongue, needed an exposure of fifteen seconds on a Paget XXX plate. Isochromatic plates were more useful for many subjects, but they were more difficult to develop. At the close of his remarks Mr. Freshwater showed a large number of slides of microscopic objects taken under various methods of illumination, including dark-ground illumination, polarised light, and reflected light.

Attercliffe (Sheffield) Photographic Society.—This new Society held its first monthly meeting on Monday, November 2, at the Old Library, Leeds-road, Mr. Calvert (President) in the chair.—After the usual business and the election of a new member, the arranging of the programme for the winter season was dealt with. Demonstrations in various phases of the science are promised by Messrs. Lygo, Nicholson, and others, and everything augurs well for a most successful season. The attendance was large and the meeting altogether very gratifying.

Bath Photographic Society.—The first indoor meeting of the winter session took place on Wednesday, the 27th ult., at the Royal Literary and Scientific Institution, Mr. E. J. Appleby (Vice-President) in the chair.—Mr. E. A. Stuckey was elected a member of the Society. Examples of work produced at the summer excursions were exhibited for comparison and criticism, the following members taking part: The Chairman, Mrs. Moody, Colonel H. Sealy, Mr. D. Prout Williams, and the Secretary (Mr. W. Middleton Ashman). Some tele-photographs by Colonel Blathwayt were also shown. The CHAIRMAN thanked the contributors, and offered to arrange a lantern display of views taken by members during 1896-7 excursions at the next meeting, providing the slides or negatives reached him by November 15. The offer was accepted. Several promises of papers were given, which will be embodied in a rota to be shortly issued. Samples of lantern plates sent by Cadett & Neall were distributed. The SECRETARY reminded the meeting that November 13 was closing day at the Royal Photographic Society's Exhibition, which he thought was the best ever held. Circulars referring to provincial exhibitions and competitions were placed on the table, and the CHAIRMAN suggested an evening to be devoted to a display of cinematograph effects, open to the public on the usual terms.

Birmingham Photographic Society.—November 2, Mr. J. T. SANDELL, inventor of the multiple-coated plate, gave a paper and demonstration upon the subject of his invention. In the course of his remarks Mr. Sandell said that the plates manufactured by his firm were of two kinds, which, it was claimed, were anti-halation plates; and, further, that it was practically impossible to give too much exposure. The "Double" plate was first coated with an emulsion of medium rapidity, and afterwards with a rapid emulsion. The "Triple" plate was first coated with a slow emulsion, followed by a medium, and, finally, a rapid emulsion. To show that it was practically impossible to give too long an exposure, Mr. Sandell produced a photograph which had had an exposure of from Saturday to Monday. The print, which was of a fairly lighted interior, showed no signs of over-exposure. In many of the prints passed round for inspection there appeared to be halation, but Mr. Sandell explained that it was not halation, but illuminated atmosphere. Many very fine slides were thrown upon the screen, testifying to the quality of the Sandell plate. Mr. Sandell proceeded to develop half a dozen plates of the same subject, which had had exposures varying from five seconds to two minutes. All the plates were developed at the same time, in the same developer, for ten minutes, and, upon fixation being complete, Mr. Sandell said it was possible to reduce those negatives which had received the longest exposures until the whole half-dozen were practically uniform.

Bradford Photographic Society.—On Monday evening, before the members of this Society, Mr. P. R. SALMON, late of Bradford, but now employed as a photographer by a Parisian house of stereoscopic view producers, gave an interesting lecture, entitled

EXPERIENCES OF A TRAVELLING PHOTOGRAPHER.

Although Mr. Salmon at the commencement confessed that he was not in good form, and that, through some Custom House delay, many of his slides had not as yet reached him, he managed to give two hours of pleasing chatty description, interspersed with anecdotes of a more or less humorous character, which made the time fly very rapidly. Some of the pictures, mostly the production of his firm, were of a very high-class character, especially the Paris views, while his own work at the Jubilee and during the Naval Review at Spithead left nothing to be desired in the matter of technical excellence. The lecturer, among other things, gave excellent advice as to how it was possible to get permission to photograph in certain prohibited places, and instanced, as an example of red-tapeism, the fact that it had taken him over six months to get a permit to photograph the Houses of Parliament. At the close of the proceedings a vote of thanks was proposed by Mr. W. HARMSWORTH and seconded by Mr. W. J. GRAY.

Coventry Photographic Society.—This Society held their usual fortnightly meeting at the Technical Institute, on Wednesday evening, when the President (Mr. William Andrews, F.G.S.) took the chair. There were fifteen or sixteen members present also. The paper read was one entitled

PRINTING AND DEVELOPMENT OF BROMIDE PAPER,

and the lecturer Mr. HAROLD BAKER, of Birmingham. Mr. Baker illustrated his remarks by a practical demonstration of the use of bromide paper, and gave many useful hints to amateur photographers in doing so.

Darwen Photographic Association.—On October 28 Mr. J. T. LEES, of the Manchester Amateur Photographic Society, delivered a lecture to the Darwen Photographic Association, entitled

THE RIVIERA AND MONTE CARLO.

Mr. George Butterworth (President of the Association) occupied the chair. The lecture was a most interesting one, and was thoroughly enjoyed by the large audience present. All the lantern slides were very fine, and consisted of views taken by the lecturer himself in London, Dieppe, Paris, Avignon, Nimes, Marseilles, Cannes, Nice, Monaco, Mentone, San Remo, Campo Rosso, Genoa, Como, and Pavia, numbering in all 150 slides. In concluding, the lecturer gave a thorough description of the method of play at Monte Carlo, illustrated by lantern slides.

Oldham Photographic Society.—The following are extracts from the thirtieth annual report: The Committee have pleasure in presenting their thirtieth annual report to the members, and in doing so they think it is a matter for congratulation that the Society is now in possession of a room which will be found useful to every class of member. It comprises developing room, enlarging room, and club room. It only remains for the members to take advantage of the facilities offered to complete the success of the venture. The comfort of workers has been carefully studied, and the room has been decorated, principally at the expense of several of the Council, and the thanks of the members are particularly due to Mr. C. A. Hempstock for providing the wall paper, to Mr. Brooks for bearing the expense of hanging same, to Mr. James Hall for tiling the developing room, and to other members for gifts of photographs, &c. The numerical strength of the Society is about the same as last year. During the year nine members have left the Society, and eleven new members have been enrolled. The balance-sheet shows a rather large adverse balance, but this is not a matter for alarm, as it is attributable to the alterations to the Society's room, and the bringing up to date of the enlarging lantern, &c., which expense will not have to be met in the forthcoming year. In fact, it may be put down to extraordinary expenditure. The programme of lantern lectures, demonstrations, &c., for the coming winter is well in hand and every effort is being made to render this session even more interesting than in the past, by securing the assistance of the best workers of neighbouring societies. The rambles during the past summer have been fairly well attended, two only having been abandoned owing to unpropitious weather—Marple and Old Oldham.

Preston Scientific Society.—The members of the Preston Scientific Society on Thursday, November 4, opened their new Lecture Hall and Rooms, the old Philosophical Institute, Cross-street, which they have recently secured from the Corporation on a yearly tenancy. Since the formation of the Society some five years ago, the necessity for meeting rooms has been acutely felt, and with the provision of a Lecture Hall and rooms for the meetings of the various sections it is expected that the usefulness of the Society will be greatly increased. The opening of the premises was celebrated by an exhibition of the work of the Photographic Section and a public ceremony in the evening, when the premises were publicly declared open by the retiring President, Mr. R. Wilding, F.R.A.S., and both this function and the exhibition proved a great success. The Committee of the Photographic Section had got together a capital selection of photographs from the members, in addition to which there were on view a splendid collection of pictures, lent by the Autotype Company, London. The latter included photographs of well-known pictures, principally from the National Gallery, illustrating the art of Rembrandt and Velasquez, and other masters in portraiture; and Turner, principally in landscape. There were also exhibits by Messrs. Morgan & Kidd, London, the Sandell Plate Company, London, and the Barnet Plate Company, also Wellington & Ward. In addition to these, the Thornton-Pickard Company sent a collection of their photographic appliances, which were explained and demonstrated by Mr. Scott, representative of the firm, and attracted a lot of attention. Mr. Marsden, member of the section, also displayed an assortment of apparatus, including an enlarging lantern and a casket of lenses lent by Messrs. Ross, Limited; an assortment of cameras, &c., by Messrs. J. F. Shew & Co., also a series of the new stigmatic lenses from J. H. Dallmeyer, Limited, and other attractive and very necessary adjuncts of a photographer's outfit. The exhibition of members' work attracted a great deal of attention, and the criticisms made during the afternoon and evening ought to prove instructive to the operators. In all, considerably over 200 prints and enlargements were hung, and, though in many instances there had been no attempt at the higher branches of the art, pictorial photography, some really first-class topographical views were shown. There was a noticeable absence of figure studies, only one member, Mr. A. W. Cooper, having attempted anything in this branch. His pictures included *The Song of the Shirt*, *Lost Melody*, and *Tuning Up*, all of which showed not only a master of technicalities, but considerable artistic merit. The same exhibitor, along with Mr. Flegg, sent in a number of effective landscape pictures, in which the atmospheric conditions were admirably depicted. Another collection of prints which attracted a lot of attention were those of the statuary in the Harris Free Library, and which were the work of Messrs. Busby and Tonge. The enlargements in bromide and Niko papers were confined, with one exception (a portrait), to landscape subjects. They were contributed by the retiring President (Mr. R. Wilding, F.R.A.S.), the Rev. S. E. Collinson, and Messrs. Busby, Gray, Kettor, Marsden, and Price. The enlargements by Mr. Wilding proved one of the features of the show, being 36×28 from 12×10 negatives. A series of capital stereoscopic views, the work of Mr. T. Newsham, were much admired and led to considerable discussion on the advantages of this class of work over ordinary photographs. A valuable and instructive collection of work was lent by Mr. C. Burton. It consisted of a series of silhouettes dating from 181 up to the appearance of silver printing-out papers in 1860. The Exhibition of members' lantern slides, which took place after the opening ceremony in the evening, proved a revelation, not only to the general members, but, to the contributors. Taken altogether, the display was most creditable, but, when the amateur—very amateur in some instances—work was thrown on the scene, the defects in focussing, development, intensity, and brilliancy were very apparent and demonstrated beyond a doubt the need of the members for a night or lantern-slide making from such an expert as Dr. Wardrop, who has promised a night on collodion-slide making during the current session; or Mr. Turner, an experienced lanternist, who has this session joined the section. Taken all round, for a first show, and one which had been hurriedly arranged, the section are certainly to be congratulated on the success which they have achieved. Mr. Wardrop manipulated the lantern.

ıeffield Photographic Society.—The monthly meeting of this Society was at the Masonic Hall on Tuesday evening, November 2, the chair was pied by Mr. S. Camp.—The prints sent in to the annual competitions on view, and the Judges' awards made known. The premier honour of year has been secured by Mr. G. W. Blackwell with four very fine inotype prints of the Norfolk Broads, to which the Judges award first e, Championship Class, and also the Society's silver medal in Class 2. bronze medal, in Class 2, falls to Mr. J. H. Lygo, for four neat bromide ıts of mixed subjects. The lantern being brought into requisition, the es which comprise Class 3 were thrown upon the screen. In this Class Mr. I. Lygo takes the silver medal with four studies of sea and sky, which were h admired by the members present. The bronze medal goes to Mr. H. J. que, for four slides of admirable technique. A large number of members' es were then passed through the lantern, during which a practical illustra- by Mr. S. G. HIBBERT and Mr. J. W. CHARLESWORTH as to which was the t light to use in making slides by reduction, viz., daylight or artificial light given. After seeing samples from each upon the screen, the meeting came to conclusion that, with careful treatment, one was as efficient as the other that purpose.

dinburgh Photographic Society.—November 3, Mr. James Patrick in chair.—The subject before the meeting was "Colour Photography." Mr. PHEN SMITH, B.Sc., read a paper on

THE APPLICATION OF THE THEORY OF COLOUR.

the course of a most interesting paper an outline was given of the three- our printing process for photo-mechanical work, and several examples were own. Mr. F. P. MOFFAT then read a paper, entitled,

A FEW THOUGHTS ON PHOTOGRAPHY IN COLOUR.

e paper showed the present state of the investigation which had been made the direction of the discovery of photography in colour. The Lippmann ocess, Mr. Moffat thought, was the one which seemed to be the nearest proach to direct photography in colour at present known. An exhibition of es's photo-chromoscope was given by J. Lizars. There was a crowded eting, and twenty new members were enrolled.

FORTHCOMING EXHIBITIONS.

1897.	
ovember 12, 13	Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
,, 16–18	Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.
,, 22–27	Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.
,, 29, 30	Durham City Camera Club. R. Hauxwell, The Avenue, Durham.
ecember 9–11	Aintree Photographic Society.
,, 28–Jan. 1 .	Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough road, S.E.
1898.	
anuary 17–22.....	Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
,, 29–Feb. 26 .	Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.
anuary–February...	Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
pril 22–30	National Photographic and Allied Trades Exhibition. A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14.....	International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

MR. H. E. DAVIS AND THE SALON.

To the EDITORS.

GENTLEMEN,—The "open letter" of my friend Mr. H. E. Davis is ased on a misconception, which I am bound to correct. He states that he hanging of the pictures has been removed from my hands, and mplies that I have quarrelled with the Salon. Mr. Davis should be nore careful of his facts. The hanging was not removed from my hands, nd I have not quarrelled with the Salon. The truth is that, both last ear and this, considerations of health compelled me to decline an office hich I never executed alone, and was always shared by others. The esult was that, failing competent volunteers, the unfortunate experiment as tried of placing the work in the hands of an outsider. It is this ork, as far as the hanging is concerned, that I commented on in Di- ressions. Whether the outsider was solely responsible for placing the ost objectionable picture in the so-called place of honour, I don't know, ut I hope so.

I still believe the Salon is the most useful institution ever connected ith pictorial photography, and I want it to continue useful. But I have a wholesome belief and regard for the old saying about the short distance between the sublime and the ridiculous; and, although the Salon may never reach the sublime, I should be sorry to see it become ridiculous, even as an advertisement. I should like the Exhibition to be kept pure, both as to process and morals, and I sorrowfully see the risky accepted and made much of, and a process pushed, where any process would be out of place, which is condemned by good authorities. The original intention was a show of complete pictures, and nothing more; yet I see an inundation of experiments in a process from abroad. As the whole public object of my life is the progress of pictorial photography, I could but protest, whatever became of it. We don't want to degenerate into the leavings of the Beardsley school and that phase of art in which affected protest for truthfulness to nature becomes tricky and wholly false.

What I am most sorry for in Mr. Davis's letter, however, is his unusual density in not being able to appreciate one of the many playful, but harmless, little jokes that have appeared on the plant "honesty" used for decoration. Surely it need not be explained to anybody but himself that not one of them implied any doubt of the honesty of the "transactions of the Salon," or that any little difference of opinion would dissociate me from the other members of the Salon, for whom I continue to have a brotherly regard.—I am, yours, &c., H. P. ROBINSON.

Tunbridge Wells, November 8, 1897.

THE EASTMAN EXHIBITION.

To the EDITORS.

GENTLEMEN,—In Mr. H. Hallier's letter, in yesterday's JOURNAL, on the Exhibitions, he wrongly gives me credit for *Listening to the Birds*. This is one of Mr. H. P. Robinson's works, as any one who takes an interest in exhibitions should have known.—I am, yours, &c.,

Whitby, Yorkshire, November 6, 1897. FRANK M. SUTCLIFFE.

To the EDITORS.

GENTLEMEN,—Will you kindly remind your readers that the Eastman Photographic Exhibition at the New Gallery closes on November 16? The attendance continues to be very large; on Saturday, November 6, nearly 2000 visitors inspected the exhibits, and the average daily attendance to date has been considerably over 1000.

Admission can be had by presentation of visiting card or by complimentary tickets obtainable on application.

After the Exhibition ends in London it will be repeated in New York, with some new features, the spacious galleries of the National Academy of Design having been secured for the purpose.

On Friday, November 5, a special gathering took place at the New Gallery, when the *employés* of the Company had a *conversazione*, to which they had invited their friends. Members of the staff attended from the Paris and Berlin houses of the firm, and Mr. Eastman himself and all the English Directors were present. Abut 700 in all attended and enjoyed a very pleasant evening. A noticeable point was that all the *employés* of the firm from Harrow were, with only three exceptions, present at the function, and of these three two were night watchmen, who could not be away, and one was absent on holiday, the last holiday-taker of the season.

This may be taken as speaking well for the healthiness of the film and photographic industry.—We are, yours, &c.,

EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED.

The New Gallery, 121, *Regent-street, W., November* 6, 1897.

PHOTOGRAPHY IN THE SOUTH OF FRANCE.

To the EDITORS.

GENTLEMEN,—I notice a query from one of your correspondents, "South of France, J. C.," page 704, October 29. He does not make clear the nature of "putting cards in houses and hotels and calling." I am well qualified to give advice, having spent many winters in the Riviera. Let your correspondent write me, and I will do what I can for him.

There should be no difficulty in getting employment in such towns as Nice, Cannes, Mentone, and even in the Eastern Riviera; but it is necessary that the seeker should speak French and be otherwise qualified. As to the climate there can be no two opinions. Where I am at present the thermometer at my open window, at eight a.m., shade, stands at 70° Fahr., three degrees warmer on an average (so says the guide books) than the Riviera. Ajaccio is a lovely place, but it lacks the beautiful churches and other interesting subjects found on the Continent generally; nevertheless, there is plenty to photograph. Naturally every visitor rushes to see the birth-house of Napoleon. Already I have taken upwards of two dozen characteristic photographs of Ajaccio, which I will exhibit on my return to England. Oh, what a climate! a paradise for plate-makers! The air is pure, clean, clear, and particularly free from dust, so intensely so that the contrast between light and shade is so great that no little difficulty arises in consequence. I have had to modify my developers, and I find the water *absolutely* pure.

Re Customs dues. I have been fortunate here. I sent over, by *petite vitesse*, over a gross of Prize Pagets, and I have not had to pay duty. Of

course, they are for my own use, and I label them so. Enclosed find a copy of label, which may be of some use to your readers, if reproduced. I usually insure, even for a small amount, and this usually insures more care, and in many cases the Customs officers never open the boxes. I forwarded over two hundredweight of baggage; the carriage, including insurance, cost a little over 30*s.* I think it is possible to get from London to Marseilles for about 2*l.* third class, but Cook will inform you the exact cost.—I am, yours, &c., A. L. HENDERSON.

P.S.—I forgot to mention that I have induced the proprietor of this hotel to fit up a good dark room for the use of the visitors.

Ajaccio.

A. L. HENDERSON.

This box contains Wearing Apparel and Photographic Apparatus for personal use only.

Cette malle contient des vêtements et de l'appareil photographique pour usage personnel.

Diese Büchse enthält Kleidungs Stücke und Photographische Apparate für persönlichen Gebrauch.

Questa cassa contiene effetti d'abbigliamento ed apparecchi Fotografici solamente per uso personale.

A PHOTOGRAPHIC SOCIETY FOR LUDLOW.

To the EDITORS.

GENTLEMEN,—The town of Ludlow abounds in subjects for photography, but up to now there has been no club.

Last evening twelve gentlemen interested in the matter resolved to form themselves into a Society to be called "The Ludlow Photographic Society," and there is little doubt but, as soon as the movement is known, the numbers will be largely increased.

The Society hopes to give a few evenings during the coming winter, and will feel particularly obliged to all clubs and editors that can lend them slides and suchlike, to make such evenings interesting.—I am, yours, &c., JOHN H. WILLIAMS, *Secretary.*

Guildhall, Ludlow, November 3, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

R. ANSCOMBE, and others.—In our next.

COL. GUBBINS.—The Superintendent, Kew Observatory, Richmond, Surrey.

PAPER (Halifax).—Of Messrs. Otto König & Co., Cross-street, Finsbury, E.C.

T. T. HORA.—The formula you require is probably that given at page 149 of the JOURNAL for March 5.

ENQUIRER.—Presuming that you want the light for photographic purposes the 1897 ALMANAC contains much information on the subject.

MINATURER.—We believe the instrument named does all that is claimed for it Write to the makers, stating your requirements. It is against our rules to recommend apparatus.

FACTORY ACTS.—W. & S. Yes; your place comes within the Factory Acts. The girls must have a weekly half-holiday; paying them extra will not relieve you. It is illegal to employ females or young persons after two o'clock on Saturday.

CHEAP LENS.—M. S. S. The lenses are fairly good, but, like all low-priced ones, they are very unequal in quality; but that is what must be expected when the price is little more than a quarter that of the best leading English opticians.

COPYRIGHT.—GEORGE says: "1. I have an order to copy some photograph of Frith's *Road to Ruin*, and should be glad to know how I can ascertain if copyright; and 2. Should I be acting illegally by copying same?"—In reply: 1. You must search at Stationers' Hall. 2. Most probably.

STAINED PRINTS.—R. BLISSARD. There is little doubt but that the stains are due to the cause suggested, namely, the cracked enamel of the iron dish in which the prints were allowed to soak after fixing. They have simply become iron-moulded. The best remedy will be to get a new dish for the work.

HERBERT JOHNSTONE (Castle Douglas, N.B.).—The precise quantity is immaterial; we would suggest equal parts by weight of the two salts. It is added to the negative fixing bath by some photographers, but the advantage gained is doubtful. Pardon us reminding you that we do not undertake to answer letters through the post.

COPYRIGHT. PROVINCIAL (Midlands) says he has just taken six portraits of a very eminent man, and asks "whether it will be necessary to copyright the whole of them, or will making one copyright do for the lot, for, although they are in different positions, they are all of the same size (cabinets), and were taken within a few minutes of each other?"—Each picture must be registered, individually, if it is desired to secure a copyright in all of them.

DEVELOPER.—EXPERIENCED AMATEUR. It may be taken for granted that the formula issued by the makers is the best suited for their plates. It may be that in the hands of some workers, as in your case, some other formula may suit them better. Many have a pet formula, and cannot get on so well with any other, whatever plates they use.

OPAQUE BLACK VARNISH.—THOS. WILCOX asks for a dead black varnish that is quite opaque by transmitted light. He says he has tried most of the commercial kinds, but they are all too transparent. If a little black pigment, such as lamp-black, be added, the opacity of the varnish will be much increased. Too much, however, must not be added, as then there would be a risk of its splitting or flaking off.

CIRCULAR PRINTS.—B. C. D. asks: "Can you kindly tell me the way to cut circular prints, now sometimes seen? Is the P.O.P. sold already cut circular? If not, how is it done?"—We are not aware that the paper is supplied cut circular. However, it is as easily cut in that shape as any other by the user, by cutting it to a round, instead of any other, glass or metal shape. For cutting round or oval, a wheel trimmer may be preferable to a knife.

DEVELOPING.—MOUNTAINEER says: "I have just returned from Wales having exposed sixty quarter-plates (five-and a-half-inch lens) on some of the highest mountain peaks there. Will you kindly give me some general notion as to the best way of developing these Empress films and plates?"—We can give no better advice than to follow the instructions issued by the makers of the plates and films, working tentatively. From the tone of our correspondent's communication we conclude he is a novice in photography, in which case he will do well to get some practical instruction in developing, or, if the negatives are likely to be valuable, to place the development of the plates in the hands of an experienced worker.

STUDIO.—H. J. writes: "I shall be very glad if you can answer me this: I have offer of business, and the studio is really part of shop; shop built out from front of houses, and so only skylight can be had, and side walls are 9 feet 9 inches to edge of skylight. I have never seen studio so built, as, of course, no side light whatever can be had. It is a long journey to go and see it, and shall be glad if you will kindly tell me if it is possible to make satisfactory portraits in such a building? You may have seen something like it."—Such a studio will be difficult to work. Still, with skill, if there is a good length, so that some of the top light can be, to an extent, converted into a side light, good portraits can be obtained. We have seen excellent work turned out of such a studio, but it required considerable skill to do it. It is an undesirable form of studio to have to work in.

SPECIMENS: LENS.—COLIN writes: "1. I am opening a studio, but am not sure that I have legal right to exhibit my own work (just at first), that was done by me when in a berth. The work is very good, and all my own. I should like to make an enlargement of one. I have often seen the thing done in many towns, because, of course, it is impossible to open without a show. 2. Is a portrait lens by 'Lereboure,' cabinet, which covers whole-plate to edges when stopped down, supposed to be very rapid, fit for studio, and worth 37*s.* 6*d.*? 3. Would same do for enlarging by daylight to 12 × 10, or would rapid rectilinear (12 × 10) do better?"—1. You certainly have no legal, or moral, right to use any portraits that you have taken for your late employer, nor have you the right to use them without the further sanction of the sitters. The law is quite clear on that point. You will have to take fresh portraits for your specimens. 2. This lens will be as rapid as any other stopped down in the same ratio. If the lens is a good one, it would not be dear at the price. 3. All will depend upon the negative to be enlarged from. If it is of large size, the rapid rectilinear will be the better of the two.

GLASS POSITIVES.—W. L. (Dunedin, N.Z.): "I asked you, some months ago a question about some photographs turning brown round the margins, but it appears I did not make it plain. I will repeat. The photographs are collodion ones on glass, and are backed by some black varnish or other. Round the edges a darkening is taking place, which is working in towards the centre. One had the glass over it broken from corner to corner, and the same blackening is taking place along the line of fracture. Can anything be done, or is the only plan to copy them in the camera? They were done about 1860 or 1861."—The pictures would appear to be glass positives and unvarnished. There is no other way of arresting the decay than protecting them from the atmosphere, which is working the injury. We hesitate in advising varnishing them now, as, in all probability, the collodion film has become more or less decomposed. We should recommend that the pictures be copied in the camera, then the experiment might be tried of varnishing, using a varnish in which benzole is the solvent.

P.O.P. TROUBLE.—T. C. SOLE (Cape Colony) writes: "I have used P.O.P. for over eight years, and consider I am fairly master of it, as far as the working of it goes, but there is one thing which troubles me very much every summer, and that is the tendency of the film to leave the foundation. I have tried alum after first washing, but the only effect which it appears to have is to give the prints a sickly look—kind of washed out. I have also tried the old acetate bath, as I thought that it might be the fault of the sulphocyanide and ammonium, which caused the film to soften, and so break away from the paper. I am only troubled with this in very hot weather, and, if you can suggest a remedy, I shall be very grateful. I am sending you a few prints of our scenery, which will you kindly accept?"—Thanks for the prints. Yours is a hot-weather trouble. The only really successful remedy is to use only *cold* water and *cold* solutions in the manipulations, invoking the aid of ice if necessary. If spring water is available—that is, freshly drawn spring water—that will help matters considerably. Carry out all manipulations in the coolest place you have at command.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1959. Vol. XLIV.—NOVEMBER 19, 1897.

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NOTICE OF REMOVAL.

On January 1, 1898, the Offices of the "British Journal of Photography" will be Removed to No. 24, Wellington-street, Strand, London, W.C.

EX CATHEDRÂ.

The Britannia Works Company announce that they are now issuing the Ilford Ordinary plates having a soluble backing that is easy to remove and does not chip. The plates are supplied to order at the usual Ilford prices, so that there is no extra charge for the backing. We congratulate the Company on this step, which should do much towards making the use of backed plates more general among photographers.

* * *

As compared with the Exhibition of 1895, the Royal Photographic Society's Exhibition which has just closed was financially more successful. Last year, when cinematographic displays and demonstrations with the Röntgen rays were made special features, a record attendance was obtained. We have observed that animated photographs and the X rays have by no means lost their drawing powers with the general public and photographers, so that, in all probability, by their non-inclusion in the Royal Photographic Society's programme this year, no inconsiderable revenue has been sacrificed. The experiment of charging 1*s.* admission to the evening meetings, instead of 6*d.*, as hitherto, was so successful that possibly the higher charge will be permanently adhered to.

* * *

We are informed that Mr. W. J. Belton, the well-known photographer of 150, Midstocket-road, Aberdeen, will during the present winter season demonstrate the Maloni flash lamp, the Sanderson Universal swing front camera, and the firm's other specialities, on behalf of Messrs. George Houghton & Son, of 89, Holborn, W.C., before the Scottish photographic societies, the secretaries of which should at once communicate with Mr. Belton where a demonstration is desired. Mr. Belton is a photographer of many years' varied experience in all branches of work, and his great practical knowledge should be of much assistance to him as a demonstrator.

* * *

Matters in connexion with next year's Convention gathering at Glasgow are already in train, and a meeting of the Council was recently held in London, at which the President-elect, Mr. John Stuart (Glasgow), Mr. George Mason (Glasgow), Past President, and Mr. William Crooke (Edinburgh), were present. Details in connexion with some of the proposed excursions and other business were discussed, and the Glasgow Executive will forthwith be formed and proceed to work. In all probability the Convention will be held during the first week in July, and, from the vigorous and enthusiastic manner in which our Scottish brethren are setting about the organization of the local arrangements, it is safe to prophesy a highly successful gathering.

* * *

We are pleased to learn that, to the series of stereoscopic subjects which they have prepared for colour viewing in the kromskop, the Photo-chromoscope Syndicate have added a number of views of well-known abbeys, castles, ruins, and landscapes in England, to which, during next spring, it is proposed to make many more additions. There could be no better plan of giving to Mr. Ives's invention the popularity that is unmistakably its due than by placing at one's disposal a series of

subjects that are familiar to tourists and travellers, which may be examined in the relief and colour of nature. Mr. Ives recently showed us over the premises of the Syndicate, where the kromskops are made, and we had an opportunity of observing the exactitude with which the instrument is pieced together from its various parts, and the care that is bestowed in assuring that the positives are correctly mounted, the coloured glasses rightly chosen, and perfect registration of the images made certain. All this work is performed under the personal supervision of Mr. Ives, to whom the success of the kromskop will mean the proper reward of years devoted to its perfection.

* * *

We have received the report of the Examination Department of the City and Guilds of London Institute for the Advancement of Technical Education. The examiners in photography (Mr. Lyonel Clark and Mr. J. D. Geddes) make the following remarks with reference to their department :—

"Section I.—Pure Photography.

"Some of the work is very excellent.

"Section II.—Photo-mechanical Process Work.

"I regret that the number of candidates should have fallen off this year.

"I would observe, in reference to photo-mechanical work generally, that there is an increasing tendency year by year, as processes advance, to train men as *specialists* in one or other of the various branches of photo-mechanical work; for instance, a man may be perfectly proficient in the department of photo-engraving, but would fail completely if tested as to his knowledge of the printing of collotype plates, though both subjects properly come under the scope of an examination in photo-mechanical printing."

* * *

The Examination Committee's report observes that, in photography, the new regulation requiring candidates to pass a local practical test before presenting themselves for the written examination in the Ordinary grade, has had the effect of reducing the total number of candidates from 168 last year to 92 this year. This reduction may be, and probably is, partly due to the additional trouble which the examination now throws upon the candidates, and to the larger amount of time it involves. Whether it gives greater value to the Institute's certificate cannot yet be ascertained. The general percentage of failures has fallen from 42·8 to 36·9, which is so far satisfactory. There is a marked falling off this year in the number of candidates for the Honours grade, notwithstanding the wide choice of tests given at the practical examination. The difficulty of the written examination, no doubt, stands in the way of many competent practical photographers presenting themselves, photography being one of those subjects of which the scientific and practical sides are every day becoming more distinct. It cannot be expected, therefore, that any large number of candidates will succeed in satisfying the examiners both as to their knowledge of the scientific principles of photography and as to their practical skill in any one of the many branches of the art.

* * *

According to the *Photographer's Record*, seven kinds of plates and five brands of sensitive paper are produced at the Barnet works of Messrs. Elliott & Son. Fourteen shades of carbon tissue are also in regular stock. A new plate factory has recently been added to the works.

JUDGING THE EXPOSURE OF POSITIVE PROOFS.

Not the least useful feature in the Eastman Exhibition, just closed, was that portion of the Technical Section in which examples were shown demonstrating the effects obtained by correct exposure as compared with over and under-printing. There can be little doubt that very many amateurs, and, for the matter of that, probably professionals as well, who regularly use gelatino-chloride and other printing-out methods, yet fail to obtain the best results possibly simply from carelessness in the matter of correct printing depth, or it may be from ignorance of the proper point at which to stop printing. In this matter the "old hand" is quite as likely—or, perhaps, more so—to go astray as the novice, for, having been educated in the use of albumen paper, he cannot shake off the traditions of that process, and goes on persistently over-printing to the same, or nearly the same, extent as with the old method. It is, indeed, very difficult to work into the full knowledge that with gelatino-chloride paper, and especially with some toning baths, the best results are only obtained by carrying the printing very little, if any, further or deeper than the finished result should be, whereas with albumen paper the untoned proof requires to be very much over-printed.

Then, again, there is another point to which far too little attention is given by the majority of photographers, and here perhaps the average professional, or the habitual user of albumen paper, is decidedly the greater sinner than the tyro new to photography altogether. We allude to the character of the negative employed. In the old days it was a customary belief—correct, no doubt, so far as it went then—that a good negative, *i.e.*, one with plenty of density combined with gradation, would give a good print under any circumstances. So far as albumenised paper is concerned, this is practically true, for, owing to the long scale of gradation and the wonderful latitude the process presented, a good average negative would give a satisfactory result, with a strong or feebly salted paper with a forty-grain or an eighty-grain sensitising bath, or would bear, to a moderate extent, either under or over-printing without giving a print that could be said to be beyond the bounds of good quality. Carrying this belief with him into the use of gelatino-chloride, or, indeed, of other printing processes, the photographer is surprised or disgusted that his "good" negatives fail to give him anything like equivalent results to those formerly obtained, and straightway blames the process, forgetting that the far shorter scale of gradation in the printing process requires a corresponding alteration in the style of negative employed—in other words, a negative image of much greater delicacy and lower density than those in vogue when albumen paper and comparatively weak silver baths were the fashion is an absolute necessity.

The average gelatino-chloride paper resembles in its behaviour the working of a highly salted albumen paper sensitised on a very strong bath—one of eighty or even a hundred grains of silver nitrate to the ounce of water—or carbon tissue sensitised on a very weak solution of bichromate, as low, perhaps, as one and a half or one and a quarter per cent. Under these respective conditions only would those two older printing methods render satisfactory results with many of the modern gelatine negatives, that not only give decent, but really admirable, proofs with gelatino-chloride or collodio-chloride. We remember, many years ago, an amateur, who tried the carbon process for the first time, going into ecstasies over its results, because it gave him brilliant and perfect prints

from a series of negatives that had hitherto proved too thin and delicate to print, with any degree of satisfaction, with any modification of the albumen and silver method. But in a short time he was as loud in his denunciation of the "uncertainty" of his new method as he had been formerly in its praise, though the fault proved to be really his own. He had commenced his experiments with no very clear idea of the importance of the strength of the sensitising bath, and had used a comparatively weak one. Finding such an improvement in the brilliancy of the prints, he resolved to still further improve them, and, carrying out the principle he would have followed with the nitrate bath, he increased the strength of the bichromate solution to the full limit of five per cent., with the result that the negatives printed no more brilliantly than with albumen paper.

But in one respect it was obviously impossible for the Eastman Company to make this portion of the Exhibition as completely useful as it might otherwise have been, though where they failed the private user of gelatino-chloride paper is fully able to make good the deficiency with very little trouble to himself. We allude to the exhibition, side by side with the finished prints, of untoned examples, printed to the same depth, just as they came from the printing frame. To show the different effects of correct and under or over-printing is all very well up to a certain point, but it still leaves the "uneducated" printer to struggle with the all-important question of just how much to carry the printing beyond the depth required in the finished print to obtain it. But, clearly, this is a matter that an ordinarily careful worker can easily settle for himself by a few experiments, and, to one who has never previously made the attempt, we can promise a surprise. Let him start with a print that, untoned, looks just as he would have it, save for colour, when finished, and then let him, by easy increments of exposure, make a series of, say, half a dozen groups from the same negative, and tone the lot together. If he is one of those who are in the habit of persistently over-printing, the result will, no doubt, be a revelation to him—a revelation, moreover, which will be altogether on the favourable side, especially at this period of the year, when the saving in time in printing will be all-important.

If the operator be in the habit of changing his toning bath or his brand of paper, it will be necessary to repeat this experiment with every change, for, so far as our experience goes, no two toning baths require precisely the same depth of printing; and, further than this, the various brands of paper differ very widely in the manner in which the results are modified by alterations in the toning bath. The sulphocyanide, phosphate, and tungstate baths are those which we find, as a rule, require least over-printing, while the acetate and carbonate require the most, in the order named. An important element at the present season is to see that the paper is not affected by damp while in the frame, as this will seriously affect the final results for the worse in every way.

A Simple Enlarging Paper.—Herr Rehnert suggests the following method for preparing a simple enlarging paper, which he has used for some time with excellent results. Rives's paper is immersed in a solution of—

Magnesium iodide	10 parts.
„ chloride	5 „
Alcohol	500 „

When dry, the paper should be sensitised by floating on a 1:12 solution of silver nitrate, strongly acidulated with acetic acid. The paper may also be immersed in the silver bath, and at any rate it must be silvered till it has become quite white. It must be exposed wet, and developed with a 1:200 solution of pyro. If more brilliant copies are wanted, the paper must first be sized with a solution of starch, and should then be floated on the solutions.

A Photographic Telegram-receiver.—Ader has constructed an instrument for photographically recording telegraphic messages. A fine wire hangs vertically in a magnetic field, produced by a horizontal strong electro magnet. The current from the cable or wire passes through the magnet, which turns to the right or left. The shadow of the wire is cast on to a slit, behind which moves a band of bromide paper, and, on development, the signals are shown white on a black ground. In an experiment between Marseilles and Algiers, 350 letters were thus recorded in a minute.

Boring and Cutting Glass.—Under the heading of "Laboratory Notes," Mr. H. Jervis has, in a recent *Chemical News*, some very useful hints for constructing simple chemical apparatus out of every-day materials, some of which it may be useful to our readers to describe. For example, if it be desired to bore a hole in a glass plate, "make a few scratches in the form of an asterisk with the point of a three-square file dipped in turpentine. Rest the glass on a piece of wooden block, or piece of cork, then turn the sharp point of a similar file backwards and forwards on the mark, or use the point of a broken file fitted in a brace, and the hole is bored in a few minutes. In some cases, usually with sheet glass, it is better to bore from each side."

To Bore a Hole in a Winchester for a Tap, &c.—"Scratch on the asterisk. If only old files are available, use first the point of a three-square to start the hole, then break off the point and work with new and larger point, and so on till the hole is three-eighths or half an inch in diameter. A smart tap will break the file as required. The new edges are very able cutters. When the indentation is thus enlarged, one of the sharp corners of the broken file can be used to groove it towards the centre with almost as much facility as a bradawl could be used on an indent in hard wood. A few turns of the file clear off the ridges, and leave the indent much deeper. If the hole is much cupped and nearly through, a smart tap with a file tang invariably makes a clean hole. There must be no hesitation in giving the tap, and no blundering brute force. The hole made, it can be readily widened by working with a taper file. . . . . Throughout these operations the tool should be moistened with turpentine, or turpentine and camphor."

The Dark Light of M. Le Bon.—M. Becquerel's elucidation of this phenomenon is given in the October *Journal de Physique*. That *savant* explains the whole of the phenomena as being caused by ordinary red or infra-red rays. Not only is ebonite transparent to such rays, but they possess the property of extinguishing the phosphorescence of sulphide of zinc, and of acting on a slightly fogged dry plate exactly in the manner M. Le Bon found his "dark light" to act. Similar results are obtained upon substituting red glass for ebonite.

Enlarging 3800 Diameters.—In the October number of the *American Journal of Science*, Mr. A. G. Mayer describes a new form of heliostat, invented by his father, Mr. Alfred A. Mayer. It is simple in structure, and possesses decided advantages. It is a kind of wide telescope, with a large objective and a biconcave lens, which concentrates a parallel beam of light upon a system of two total-reflection prisms, one of them being mounted on the axis of rotation. A very powerful beam is thus obtained, which, singular to state, is so free from heat as to permit the most delicate slides to be placed in the beam with perfect safety, magnification to the above extent having been thus obtained.

Delicate Astronomical Photography.—Considerable discussion has lately been taking place upon this question. Dr. T. J. J. Lee says such photography cannot be done; Professor L. O. Wadsworth says it can. Who shall decide when doctors disagree? The former says that, during the constant flickering and shifting of the image, owing to the uneven transparency of the atmosphere, the eye can select and arrange; "it readily determines what is permanent and what is transient;" with the plate all the varying phases seen by the eye are collected and superposed, the result being a general unsharpness. He places ·5 inches as the minimum limit of size of object that is photographable. On the contrary side, Professor Wadsworth says that photography, up to the present time, has failed, because the particular ways in which it has been applied have not, perhaps, been the best to secure the most satisfactory result. To get rid of "dancing" of the image, Professor Wadsworth places an observing telescope alongside the camera, only making camera exposures when, by the eye at the telescope, he finds the conditions good.

Photography of Human and Magnetic Effluences.—For many years past the question has been discussed whether from magnets and from the human body there does, or does not, proceed a certain mysterious fluid which, to some persons, under special conditions, is visible. The original discovery, or assertion of discovery, of this fluid was by Baron Reichenbach, who termed this fluid or force "Od" and he considered it to pervade all nature and to be a result of all motion, and the cause of what was termed in his days mesmerism, and nowadays hypnotism. From time to time this question has greatly excited the world of physical philosophy, and it bids fair again to create some further excitement, for the question has been attacked by the aid of photographic methods. In a late issue of *La Nature* will be seen process-block prints of photographs, obtained (1) by exposing a plate placed in the developing solution to the action of a magnet, and (2) by placing a hand in a similar position. In each case are undoubted indications of an action from centres indicated in the one case by the poles of the magnet, and in the other by the human fingers. It is argued against them that, in the first case, it is well known that a plate in the developing solution will become wave-marked if not stirred; and, as to the second case, the heat of the fingers would also cause action. Against this argument M. Ch. Brandt operated by placing magnet and fingers against the back of the plate, placed face downwards on small supports; still the marks. The heat of the hand would go through the glass, he was told; therefore he tried a glove, filled with mercury at a temperature of 212°, and used that in lieu of a hand; result, *nil*.

JOTTINGS.

Lord Crawford's presidential address to the Royal Photographic Society, in which he advocates reform in our system of weights and measures, takes us over well-trodden ground. There is an almost universal agreement as to the desirability of adopting the metric system, but at present only a very few scientific men use it in practice. I expected that Lord Crawford would have recognised that a revolution of this magnitude could not be effected without Parliamentary compulsion. Reliance for the adoption of a total change of system upon the individual will not, I fear, take us much nearer actual reform—that is, while probably ninety-nine out of every hundred of us are taught from childhood to "think," as Captain Abney once remarked, "in grains and ounces." The root of the matter must be sought in the schools, at which our children must be made to think in grammes and cubic centimetres. For all that, let the reader reflect that a change in the national system of weights and measures will be felt in every branch of trade and industry, and in every relation of one individual towards another, and he will realise that the chances of voluntary reform are not worth a moment's consideration.

But there is one little reform in connexion with the photographic use of English weights and measures which is so simple of adoption, and would be so welcome to many photographers, that I am surprised that those manufacturers and others who are responsible for the dissemination of photo-chemical formulæ have not all taken to it before now. I allude to the expression of the ingredients of a formula either as "parts," or grains per ounce. A glance through the Formulæ Section of The British Journal Photographic Almanac will show that there is a lack of agreement amongst manufacturers on this subject. Writing as one whose lot it is to make up many new formulæ in the course of a year, I can say that my time and trouble would be considerably saved if the "parts," or grains per ounce, system were in general use, and one had not frequently to compound solutions in which the reagents bore no definite or discoverable proportional relationship to the diluent.

Here is a typical example of the ill-constructed formula it has often been my lot to have to work to—

Water	1 quart.
Metol	¾ ounce.
Soda sulphite	7 ounces.
Solution of potassium carbonate	3½ „
Potassium bromide	⅒ ounce.

A very fair amount of arithmetic is required in order to enable one to know where one is as regards the ounce proportionality of the ingredients in the above formula, which gives a volume of solution ready for use. I tender another hint in relation to this subject, which, wherever adopted, would make me bless its adopters. This is to indicate on all packets and bottles of chemicals the quantity they originally contain. I am the recipient of a considerable quantity of photographic chemicals in small parcels, but the people of whom I order them rarely mark the weight of the contents of the packages or bottles upon them; and, as the chemicals are not often wanted at once, time frequently has to be devoted to weighing and measuring when it is required in other directions. This is a little point, I know; but it is worth noting by those concerned, for the man who saves your time saves you money, and which of us despises the latter, no matter how small the amount of it may be?

What a magnificent advertisement the forthcoming Crystal Palace Exhibition of the Royal Photographic Society has already received! In nearly every Continental, American, and Australian photographic publication the prospectus has been more or less fully reproduced, and an exterior view of the Palace has been given. I shall be surprised if the response from abroad is not a very hearty one. Meanwhile, the home support is most gratifying. I wish here in particular to bring to the notice of those professional photographers whose work has not recently found a place on the walls of the Pall Mall Gallery the fact that the Crystal Palace Exhibition was partly resolved upon with a view of giving them a chance of exhibiting photographs which will not pass up-to-date "artistically" inclined selection committees. In other words, the "usual thing" will not be barred. I fully expect to find next April that the "croakers" whose mission it is to condemn the Palace as the scene of the Exhibition, and to predict the failure of the Royal Photographic Society's efforts to make it a huge success, will be vary badly disappointed.

The rabbit-hutch at No. 12, Hanover-square, W.—that is how the "Royal" meeting-room was once referred to by a writer of my acquaintance—will probably not be equal to the demands that will be made upon it on the night of Tuesday, December 14, for on that date I am told that Professor Gabriel Lippmann is coming over from Paris to lecture on "Colour Photography." It will be interesting to know whether the Professor has made any further advances in the interference method that is due to him, and which is so difficult in practice that not more than three, or at most four, other experimenters have been able to obtain results with it. While I am on the subject, a note of congratulation may be passed to the Royal Photographic Society on the very fine programme of papers it had last session and is having this. Recently such subjects as Photomicrography, The Spectroscope, Three-colour Work, and Weights and Measures, have been handled by competent authorities before large

audiences, and the remainder of the session promises to be quite as attractive. What an improvement on the not distant time when the Society was the butt for all sorts of jokes concerning the tameness and inutility of its proceedings, and the London photographer was driven to the smaller societies to find matter worth listening to! Nowadays things are reversed, and a glance at their reports will show that the societies to which I refer are still threshing out subjects of which the constant reader of photographic newspapers must be heartily sick and tired.

Madame Garet-Charles, an extract from whose article on the Art of Photographing Women was given last week, holds out what at first sight may appear a dismal prospect for the mere man photographer. She tells us that, as a rule, women prefer to be photographed by women, and, as she herself is a successful photographer, she speaks not as one of the scribes, but with authority. Still, although Madame Garet-Charles gives some plausible reasons why ladies prefer to face the camera when it is operated by one of their own sex instead of a man, I do not think she is correct in her conclusions, for all that. Analogy and experience are against her. Women, as a rule, do not appear to prefer to be painted by lady artists, attended by lady doctors, measured by lady tailors, and so on, and so on. So why should they prefer to be photographed by lady photographers? The exceptions to the rule only prove that variety of taste and inclination exists among women, as among men; but this is surely insufficient ground upon which to base the sweeping statement that, as a rule, women prefer to be photographed by women. If they did, I take it the demand would make itself felt more widely than it does. My own idea is that the average woman would rather exhibit those little weaknesses of complexion to which Madame Garet-Charles *naïvely* refers to a man than to a woman, for on that subject men are usually far less prone to be critical and unkind than women. Is it not so, ladies?

But I do not think that men photographers need allow themselves to be alarmed at the probability of the "gentle" sex ousting them from their studios, as they are ousting male labour in other walks of life. The balance of photographic ability will remain, as it always has been, on the side of the men; and this will effectually prevent studio portraiture falling into the hands of the ladies. Madame Garet-Charles herself supports this view, for she tells us that, in order to make faithful pictures of her sitters, she does not do so at a first interview, but studies them at afternoon tea, and, after they have gone, decides what they are to do when they "return to face the deadly lens." This is a very charming, but utterly uncommercial, way of doing things, which only one lady photographer here and there could possibly manage to adopt. The ordinary man photographer has to be content with one interview and no five o'clock tea, and, on the whole, he manages to get very good likenesses that way. As to *knowing* a sitter, no photographer ever can, if it be true that, in order to *know* a person, one must live with him. And I certainly don't think five o'clock tea the best way of enabling one lady to know another. I submit that opinion on the authority of a lady, but it is also my own.

The Salon this year elicited a storm of adverse criticism and found so few defenders that it looks as if a conspiracy of silence had been agreed upon by the Linked Ring. Only one gentleman, Mr. C. H. Hewitt, of Gateshead, on p. 687 (October 22), joins issue with me over my remarks of October 15. He seems to think that because the Salon has been ridiculed, therefore it is, or must be, good. A more delightful example of the *non-sequitur* in argument could not be penned. Again, he falls foul of me for quoting daily newspaper criticism against the Salon. I might, did I care to take up the necessary space, also quote the *Saturday Review* (October 9), and many other influential papers of the same stamp, in support of my original contention that educated public opinion was dead against the pretentions of the Salon, as expressed in the catalogue "forewords," but I suppose this would still leave Mr. Hewitt unsatisfied that the drift and measure of public—non-photographic—opinion could only be ascertained through the public press? On the same page of the JOURNAL in which Mr. Hewitt's letter appeared two other photographers wrote much in the same strain as I did, while, on October 29, Mr. Robinson's Digression if I may be allowed to say so, might have been written by myself, so closely do most of his sentiments tally with my own. Clearly, therefore, I am not alone in my expressions of ridicule. But perhaps I err in taking Mr. Hewitt seriously? If I don't, I should be glad to know whether like myself, he has seen and studied the five Exhibitions of the Salon, and has as good opportunities for forming a critical judgment on the subject as I have? If not, his intervention in the controversy can only be regarded as superfluous. COSMOS.

MONOCHROMATIC LIGHT FOR PHOTO-MICROGRAPHY.

ALTHOUGH we frequently hear the term monochromatic light spoken of in connexion with the microscope, the term is, in its strictest sense, distinctly a misnomer, for all the preparations which have been suggested by no means give pure monochromatic light; nor, if we use the spectrum itself, do we light on one wave-length only, but a narrow band of several wave-lengths, and every spectroscopist knows that, although slight, yet each wave-length practically produces a different colour.

The use of a light filter in photo-micrography has two purposes: the one the correction of the objective; and, secondly, the increase of contrast in the image. There is a third purpose and a most important one, which, however, will probably interest the expert microscopist more than the photo-micrographer, and that is the increase of the resolving power of the microscope, as stated by Dr. Spitta in his recent address before the Royal Photographic Society. Dr. S. Czapski has laid down the law that the greatest resolving power will be obtained by using light of short wave-length, even the ultra-violet.

Taking the first two reasons, we may be able to define what a filter should and should not do. In the first place, if the objective is corrected for the visual rays and not for the chemical, it is obvious that the image on the sensitive plate will not be sharp, exactly the same thing occurring as was frequently met with in the early days of photographic objectives.

In the discussion which followed Dr. Spitta's paper, Dr. Bousfield rather fell foul of him because he stated that, to photograph a red-stained object, he used a green glass filter. The possible explanation of Dr. Spitta's use of a green filter is that what he calls a red stain is that, although red when examined spectroscopically, it would be found to absorb practically the green, allowing the photographically active blue-violet rays to pass, and therefore the green filter absorbed the violet, and gave more contrast in the resulting negative, leaving only the greenish-blue to pass, which are not so active.

For this purpose it is as well to recognise what coloured filters will absorb certain colours, and the following table will therefore be useful:—

Red	is absorbed	by	green.
Orange	„	„	„ violet.
Yellow	„	„	„ „
Green	„	„	„ red.
Blue	„	„	„ orange.
Violet	„	„	„ yellow.

The most generally used filters at the present time are Zettnow's chromate of copper, ammonio-sulphate of copper, Fehling's solution, and potassium bichromate, besides signal green, chromium green, and other coloured glasses; although the light they allow to pass is by no means monochromatic, but practically the whole of the spectrum with certain portions dampened down.

In order to make the action of screens thoroughly understood, it

will be advisable to give the following tables of the Fraunhofer lines and the spectral colours:—

Fraunhofer lines.	Wave-length.	Fraunhofer lines.	Wave-length.
A	759 $\mu\mu$	E	527 $\mu\mu$
B	686 „	F	486 „
C	656 „	G	430 „
D	589 „	H	396 „

Distribution of the Colours (after Listing).

Red	723–647 $\mu\mu$	Bright blue	491–455 $\mu\mu$
Orange	647–585 „	Blue-violet	455–424 „
Yellow	585–534 „	Violet	424–396 „
Green	534–491 „		

Zettnow's cupro-chromate filter allows light from wave-length 570 to 550 to pass, and is made by dissolving 160 grains of pure dry cupric nitrate and 14 grains of chromic acid in 250 c. c. of water. The thickness of liquid should be 1 cm. The ammonio-sulphate of copper allows light from 475 to 400 wave-length to pass, and this is prepared by dissolving finely powdered sulphate of copper in four times its weight of liquid ammonia (sp. gr. 0·96). When diluted, or with a thin stratum of solution, light of wave-length 515 will get through.

Fehling's solution cuts off the extreme red and the ultra-violet. The potassium bichromate absorbs the violet, blue, and bluish-green, according to its strength and thickness.

Landolt's filters, as used for polariscopic work, should be useful for microscopic work, and the following directions for making them may be useful:—

Red Filter.—Crystal violet, 5BO, 0·05 gramme, should be dissolved in a little alcohol and diluted to 1000 c. c. with water, in a trough 20 mm. thick; this gives a red band with a broad blue-violet band, which can be absorbed by a ten per cent. solution of potassium chromate. The red stripe left begins about λ 718, and ends abruptly at λ 639.

Yellow Filter.—Dissolve 30 grammes of nickel sulphate in 100 c. c. of water, and in a thickness of 20 mm. this absorbs the red only; a ten per cent. solution of potassium chromate in 15 mm. thickness absorbs the blue, and a 15 mm. thickness of 0·025 gramme of potassium permanganate in 100 c. c. of water absorbs the green, leaving λ 614 to λ 574.

Green Filter.—Cupric chloride ($CuCl_2 2H_2O$), 60 grammes dissolved in 100 c. c. water, and 20 mm. thickness, passes the green and blue, and a ten per cent. solution of potassium chromate in 20 mm. thickness absorbs the blue, leaving λ 540 to λ 505.

Bright Blue Filter.—Doppelgrün, SF0·02 gramme dissolved in 100 c. c. of water and in 20 mm. thickness, leaves a narrow red band, a broad green band with the bright blue, and 15 grammes of cupric sulphate dissolved in 100 c. c. of water in 20 mm. thickness absorb the red and green, leaving λ 526 to λ 458.

Dark Blue Filter.—0·005 gramme of crystal violet 5BO dissolved in 100 c. c. of water in 20 mm. thickness, and the sulphate of copper solution as used above, also in 20 mm. thickness, allow λ 478 to λ 410 to pass.

A. D. Pretzl.

TONING WITH VARIOUS METALS.

The Exhibition of the Eastman Company will, doubtless, draw attention to the use of metals other than gold for toning, and, whilst these notes treat of printing-out papers, some suggestions may be useful for bromide as well.

The use of platinum is, of course, well known, but the other metals of the platinum group which have been used for toning are palladium, rhodium, iridium, osmium, and ruthenium. Mercier has tested all these, and gives the following baths:—

Palladium chloride	1 gramme.
Sodium	1 „
Water	100 c. c.

Shake for some minutes, and, if the salts do not dissolve at once or a precipitate is formed, heat in a porcelain dish till the solution is clear, and add 10 c. c. of acetic acid, and also 400 c. c. of water. Prints are toned very quickly to a black colour, but the whites are tinged yellow, which discolouration may be partially removed by a five per cent. solution of ammonia.

Messrs. Kelly and Humly stated, in the *Photographic News*, that the following bath,—

Potassium chloro-palladinette	0·4 gramme,
Sodium chloride	4·0 grammes,
Citric acid	4·0 „
Water	1000 c. c.,

yields a series of tones ranging from sepia to black, which are far softer than anything than anything that can be obtained with platinum or gold. If ammonium molybdate be used instead of the salt, a fine chestnut brown is obtained. The only precaution to observe is to wash thoroughly between toning and fixing.

The double chloride of rhodium and sodium merely gives the prints a brick-red colour.

Iridium gives good violet tones when the following is used:—

Sodium tartrate neutral	0·15 gramme.
Potassium-iridium chloride	1·5 grammes.
Distilled water	100 c. c.

Boil for ten minutes, and add 400 c. c. of water, and 10 c. c. of acetic acid.

Osmium gives blue half-tones and brown shadows:—

Osmium ammonium chloride	1 gramme.
Sodium chlorate	0·04 „
Sodium succinate	4 grammes.
Succinic acid	12 „
Water	1000 c. c.

Ruthenium gives but little result.

In 1863 Balsamo suggested the use of aceto-nitrate of bismuth, which gives chestnut brown:—

Acid nitrate of bismuth	20 grammes.
Acetate acid	100 c. c.
Distilled water	1000 „

Mercier states that, if a print is toned with gold, and fixed, well washed, and then immersed in—

Mercuric chloride	0·25 gramme,
Salt	5 grammes,
Distilled water	1000 c. c.,

carmine-red tones will be obtained.

The use of bromide of copper, followed by ammonia, is, of course, well known, as well as Carey Lea's method of converting the image into silver iodide, and then obtaining a scarlet image by the use of a five per cent. solution of Schlippe's salt. The addition of a little ammonia gives various shades of brown.

Redares, in 1892, suggested the use of cobalt chloride with calcium acetate, but stated that he could get but little effect under two hours.

DEVELOPING, TONING, FIXING, WASHING, AND DRYING PHOTOGRAPHS IN ROLLS.

Mr. W. Grunow's invention relates to that kind of photograph in which a roll of sensitised paper is led under a photographic plate and there exposed to the light. The paper thus treated which bears the photographic pictures is then, by means of the apparatus forming the object of the present invention, converted into an actual picture. In the accompanying drawings,

Fig. 1 is a side view thereof;

Fig. 2 a plan view;

Fig. 3 a side view of the drying apparatus in connexion with fig. 1;

Fig. 4 a section along the line, A, B, in fig. 1.

Cylinders or rollers, marked *d*, are rotated by the worms, *b*, on the shaft, *c*, the said cylinders or rollers being on the upper edge of the vessels, *e*, *f*, *g*, *h*, and so on.

At a lower level than the cylinders or rollers, *d*, are a second set of cylinders or rollers, *p*.

The end of the paper coming from the apparatus where it has been xposed to the light is led by means of an extension strip of paper or ape already in position round all the rollers, over the cylinders or rollers, down over the rollers, *p*, and thus through the several vessels, where, n consequence of the vessels containing certain baths or solutions, the hotographs undergo the known photo-chemical processes, and are deve-oped, washed, fixed, toned, and the like. The paper, after coming from

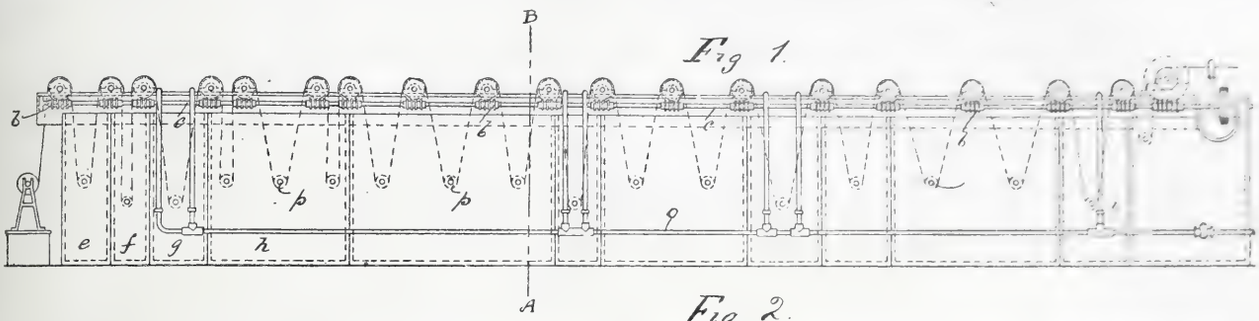


Fig 1.

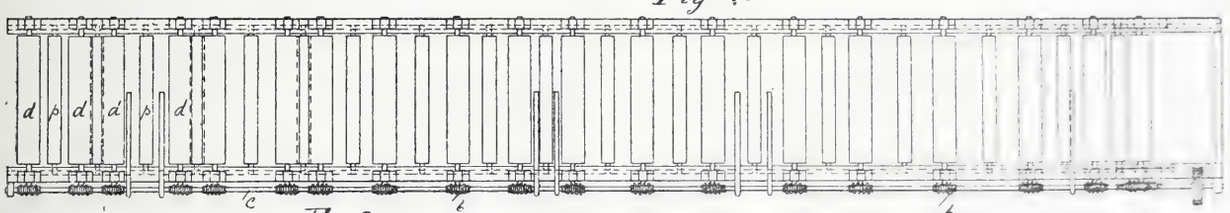


Fig 2.

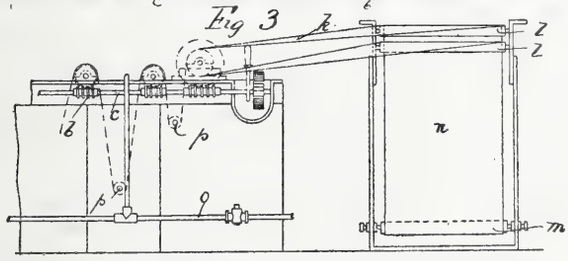


Fig 3

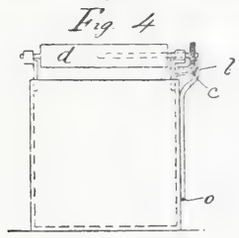


Fig 4

the last vessel, *i*, arrives on an endless cloth band, *k*, which is led over two sets of rollers, *l* and *m*, surrounding a space, *n*. In this space or chamber is a gas flame or other heating contrivance, so that the paper which is led on the endless cloth is dried. Pipes, *o*, suitably provided taps, allow of the several vessels being filled with liquid.

THE COMBINED TONING AND FIXING BATH AND ITS DANGERS.

Mr. C. H. Bothamley, F.I.C., F.C.S., in *Photographic Scraps*, has the following extremely useful article on this subject:—

I have recently examined, at the request of the Britannia Works Company, a batch of P.O.P. prints which had faded somewhat rapidly, and as the results of the inquiry illustrate in a very striking way the dangers that attend the use of combined toning and fixing baths, and the importance of certain points in the manipulation of P.O.P., a detailed report thereon may be of interest to the many users of this paper.

The prints were sent to me as received by the Britannia Works Company from a correspondent, and were twenty-four in number. They showed various degrees of fading; some were but little changed, whilst in others the dark bluish-purple image had almost completely faded to a dirty yellowish-brown. It was stated by the worker of the prints that the washing had been very thorough, and that the prints had been kept out of contact with any noxious substances. One point connected with them is of very special interest, *they were unmounted*. This, and the fact that they had evidently been kept quite dry, at once eliminated one of the most familiar possible causes of fading, and made it clear that the cause must be sought for in the prints themselves.

Information was given that the prints had been treated with a combined toning and fixing bath, which contained—

Ammonium sulphocyanide,
Lead acetate,
Lead nitrate,
Alum,
Citric acid,
Gold chloride,
Hypo,

but the proportions were not stated.

I may say at once that, for reasons which will appear subsequently, this represents the worst type of combined bath, and contains just those very substances which have been shown to lead to fugitive prints. Baths of this kind always seem to me to be compounded on the same principles as the ancient medicines of Galen and his followers, namely, to put in a maximum of different constituents, and make them as nasty as possible.

Twelve out of the twenty-four prints were examined, and it was found that *only one of them had really toned* in the sense of having had a satisfactory amount of gold deposited all over the image; this one was unaltered. Two had a deposit of gold on about half the image only, and a fourth showed traces of gold, but *eight out of the twelve contained practically no gold at all*. In other words, all had been toned to the extent of a change of colour, but in almost all cases the toning was sulphur toning, and not gold toning. All the prints were found to contain a rather unusually high proportion of silver sulphide.

These results are easy to explain. It has long been known that a fixing bath mixed with alum or an acid will produce what is called sulphur toning, and impart to the print a colour which is indistinguishable from that produced by gold, although no gold at all has been used. In 1895, at the Convention, and in 1896, at the Camera Club Conference, I described experiments which show that a fixing bath which contains lead salts, but no gold, will impart to gelatino-chloride prints the same colour as a gold-toning bath, although, of course, they can contain no gold. In this case also a kind of sulphur toning takes place.

In all cases, whether the fixing bath has been mixed with alum, or with an acid, or with a lead salt, the toning, in the absence of gold, is due to the formation of some silver sub-sulphide. Now, silver sub-sulphide is very liable to change, and gradually splits up into silver and ordinary silver sulphide, and, since the latter in thin layers has a pale yellowish brown colour, it follows that the chemical change is accompanied by a marked fading of the print.

At the same time I pointed out that, even when a combined toning and fixing bath contained gold as well as a lead salt and alum (or an acid) or both, it was quite possible that the sulphur toning might take place before the gold toning, the prints consequently being withdrawn from the bath before any gold was deposited on them at all.

The prints in question afford a striking example of the truth of this statement. Either because the sulphur toning preceded the gold toning, or because all the gold had been very quickly used up, they acquired the proper colour, and were consequently withdrawn from the bath before gold had been deposited on them. The result was that the apparently toned images owed their colour to silver sub-sulphide instead of to gold, and they were very liable to fade.

No information was forthcoming as to which of the prints had been toned first and which last, and therefore it is impossible to say whether the one print that was really gold-toned was put into the bath first or not. It is, however, important to bear in mind that one of the great sources of danger in the use of a combined toning and fixing bath, containing a lead salt or alum or an acid, is that long after all the gold has been used up it will go on "toning" (sulphur toning, of course), and thus lead the operator to suppose that it is all right. But the prints will fade sooner or later, and generally sooner.

There is another important point in connexion with this particular

batch of prints. Many of them, quite apart from the fading, showed a yellowish stain extending over the whites as well as over the image, and frequently in patches instead of over the whole print. This stain consisted of silver sulphide. Now, such stains may be produced by imperfect fixing or by imperfect washing after fixing. In the former case they are generally in patches; in the latter they usually extend over the whole print. In the prints under consideration I have very little doubt that the stains, which were only slight, were the result of imperfect fixing; but whether this was due to the exhaustion of the bath through being used over and over again, or to the fact that the decomposing action of the citric acid and alum on the hypo had made it much weaker than it was supposed to be, or whether sulphur toning went on with such rapidity that the prints were toned before they were fixed, I am unable to say. But the stains illustrate another possible danger in the use of the combined bath.

The general fact, of which these prints are but one more illustration, is that with the combined toning bath containing lead salts, or alum, or an acid, there is no guarantee at all that the prints which seem to be toned are really toned with gold, and if they are not toned with gold the odds on their fading are very great.

The moral is, Use separate toning and fixing baths, and keep your toning bath as simple as possible.

NOTES ON INSTANTANEOUS AND PICTORIAL PHOTOGRAPHY.

[Abstract of President's Address to the Edinburgh Photographic Society.]

Amongst the younger army of photographic workers there seems to be a tendency to sacrifice everything for instantaneous work. This magic word, "instantaneous," seems to have a strong fascination for a great many. The desire to fix animate objects before being able to photograph the inanimate is a common and universal mistake. It is only after having worked a camera resting on a good substantial tripod that one can ever hope to work successfully a hand camera, and therefore my advice to the younger army of photographers is to carry a tripod, and not bother about quick plates and instantaneous shutters. Instantaneous work is not best suited to the production of artistic results. When I say instantaneous, I mean an exposure of less duration than is perceptible with the eye. Experience has taught me that, for all pictorial purposes, one need never use a shutter working at a greater rapidity than a fifteenth or a twentieth part of a second. The speed of the shutter should always be the slowest possible compatible with photographing an ordinary moving object, and the stop used should give the largest available light consistent with the depth and definition required. When motion is meant to be represented, it should be thoughtfully attempted, and photography may then suggest it at least. Of course, a great many of our modern sports demand the greatest speed possible; but my remarks refer principally to pictorial work. As an illustration of what I mean, I may single out an instantaneous photograph of breaking waves. The chances are the result will be, to all appearance, a frozen sea. Taking the same object with an exposure of about a second or two seconds, you get a true suggestion of breaking water. The eye does not see each moving jet of foam, but only catches the surging snowy mass; and what the eye does not see in nature it naturally refuses to recognise in art. Therefore a suggestion is far more artistic than hard facts and prosaic detail.

Only a few months ago, while spending a holiday at St. Andrew's, I saw glaring instances of the abuse of the hand camera and instantaneous photography. Dozens of hand cameras were pointed within a few feet of old Tom Morris (the father of golf), and, it mattered not how the light was shining, the button was pressed. This sort of thing can only be beneficial to the plate-makers, and, on seeing so much waste going on, I could not help remarking, "It's an ill wind that blaws naebody guid."

There is no denying the fact that pictorial photography has made great advances in the past few years; that it is asserting itself as a means of artistic expression no one can deny. What means, however, may be legitimately used in the work of progress is not at all agreed upon. At the present time, for instance, we find retouching on a negative is allowed to almost any extent, but, whenever we bring a brush or pencil in contact with a print, then we lay ourselves open to adverse criticism. I need scarcely mention to an audience such as this that it is an utter impossibility to photograph a scene in its true relation of colour values, even when using isochromatic plates and yellow screens. If this be admitted, it is surely legitimate to bring into play what artistic knowledge one may possess in bringing his picture nearer to the truth in nature, either by applying a certain chemical to the film, or toning down scattered high lights and correcting awkward forms. Nature supplies us with the raw material only, and it is the artist's duty to select from nature what is worthy of imitation and reject what is unworthy. A landscape in the true artist's hands is the embodiment of a thought, and all that is in the picture is there, so to speak, to focus and centralise that thought. Everything is introduced to subserve the dominating motive. It is difficult sometimes to realise that colour plays such a deceiving part in our art. I remember well the disappointment I felt when photographing a scene where the beauty of the subject lay in the brilliant effect of sunlight on a foreground of dead yellow reeds. But, alas! in the photograph the tone values were not the tone values I saw in nature, very far from it. Instead of a mass of light I had a mass of half-tone. The predominant colour was yellow, and yellow, as you all know, is the most difficult of all the rays of the spectrum to photograph successfully. Hence the absence of sunlight in my picture.

Two months ago I had the pleasure of spending some time with Mr. Peter Graham, the Royal Academician, and in the course of conversation he mentioned having seen the effect of sunlight caused on a dull day by a quantity of yellow sand which had fallen on the roadway from a passing cart, thus proving that to paint the effect of sunlight the predominant colour must, of course, be yellow. And so it comes about that one seldom sees the effect of sunlight portrayed successfully by photography. I only give this as one of the many instances of the limitations of photography. But to acknowledge limitations is not, as many would have us believe, an admission of weakness or worthlessness. Every art has its limitations—painting, poetry, sculpture, as well as photography; and, when one fully realises this, he is better prepared to work successfully within bounds.

Now, there are certain seasons of the year in which photography can meet nature on an equal footing as far as colour, or rather the want of it, goes. Winter, when nature is arrayed in black and white, is, in my opinion, the season of the year when the landscape photographer can come nearest to the truth. I would, therefore, strongly urge the members of this Society not to lay their cameras on the shelf during the winter months, but to be up and doing, and they shall be rewarded.

While the artistic side of photography has been making great progress, so, too, has the scientific side. Ever since Daguerre declared to the world his discovery of taking sun pictures, the possibility of photographing, on a sensitive substance, Nature in her glorious profusion of colour has exercised the minds of many an experimentalist, but as yet no practical process has been worked out. The chemistry of the subject presents obstacles of a very serious nature, and it would, I feel, be very unwise to predict that the coveted goal will ever be reached. When we come to consider the marvellous discoveries made in this nineteenth century of ours, we are prone to wonder if photography even yet is not in comparative infancy. The translation of form we know is complete, but that of colour has yet to be perfected; and, if ever that time comes, it will be impossible to over-estimate its value. It remains to be seen whether or not it will bring "grist to the mill" of the professional photographers. We hail with delight the birth of a new discovery, and do not give serious consideration to the influence it will have on our professional work. Within the past few years we have seen a revolution in process work, for instance, in which photography is almost exclusively used, and you can now purchase twenty-four views of Edinburgh "made in Germany" for a few pence. Trashy though these productions are, they threaten to reduce the landscape photographer to despair.

J. Patrick.

"A NEW PHOTOGRAPHIC PROCESS."

Fakirs, with a scheme that is new, at least, to the police of this city, have been operating in the North End for the past two weeks, and numerous complaints are being made by the victims of two smooth young men and a camera, to say nothing of the dog.

According to the data so far obtained, these young men arrived in town says the *St. Louis Daily Globe Democrat*, just before the fair began, and had a tent on the grounds, where they made tintypes, "two for ten cents while you wait," and the young men, doubtless, made several dollars during the week; but, with that sordid, grasping nature which some men have, they were not satisfied, and started out to "work" the town. Their method was the same in all cases, so far as is known, and is so unique that it will bear an explanation, not only for the intrinsic value of the originality, but for the benefit of those who might otherwise be tempted to have pictures taken "by a new and entirely original process which has just been patented, and is known only to ourselves," as the smooth young men explained.

It was usually just after dinner, about the time that the housewife had cleared away the dishes and put on her afternoon gown, that one of the children would come in and beg her mamma to "come out and see the funny little white dog turning somersaults," or perhaps there would come a gentle rap on the door, and, when madam responded, she would find a well-dressed, nice-looking young man on the porch. In either event, the madam would eventually learn that he and his partner were taking pictures by a new process, just invented, &c. By this method photographs, not tintypes, mind you, but genuine photographs, could be taken and finished the same day.

"Perhaps, madam," would say the young man in the Fedora hat, "you do not know why it takes a photographer a week or longer to complete a photograph. It is because, if a picture is exposed to the light within three days after it is taken, it fades away. We have completed a process by which it takes less than a day for a photograph to become fixed, and we will be glad to make a picture of you in your parlour, on your porch, or in the garden, for 25 cents, three for 50 cents, or a dozen for 1 dollar. If you choose, we will take a dozen in three different positions, and the

est part of it is that your pictures are delivered to you immediately, and o-morrow morning you can open the box and find pictures just as good s if you had paid 5 dollars a dozen for them, waited a week, and made alf a dozen trips to the studio."

It was a "good talk," and it usually went through, too, because the amples the young men showed were excellent. Then, too, the children vere delighted, especially as the young men allowed them to hold the unny little white dog, which stood on its head, while they "looked leasant." The young man would train the camera, there would be a lash, and it was over. In ten minutes, after many mysterious moves, he young men would deliver a pasteboard box, securely sealed with wax, nd on it would be written an hour on which it might be opened, usually bout twenty-four hours later. Then, after collecting one dollar, the oung men would bid the madam a pleasant adieu and go down the treet, the little white dog wagging his tail with doggish delight.

At the stipulated time the household would assemble to see the pictures. The seals were broken, the string cut, and the box opened, nly to expose half a dozen sheets of butcher's paper. Many North St. Louis homes now have these interesting souvenirs in the parlour, but as yet but one person has made a complaint at police head-quarters. This person is Mrs. A. Schroeder, of 2022, Prairie-avenue, and she has eighteen sheets of this paper neatly cut, for which she paid 1 dol. 50 cents in hard-earned money.

PROCESSES—NEW AND NEWER.

In the *Nineteenth Century* for last month, Mr. Joseph Pennell, in an article on "Art and the Daily Paper," sings the praises of the process employed in illustrating daily papers, giving special credit to the *Daily Chronicle* for bringing the process to the front. He says it was not until a little over two years ago, when the *Daily Chronicle* one morning suddenly appeared containing effective drawings of the size of those published in the weekly illustrated papers, that editors generally gave any thought at all to the subject. He further says "the change has come about very gradually until lately. But the Jubilee seems to have completed the change, almost all the dailies at the time having published illustrations. Even the *Times* blossomed out in colour with a supplement—made in Germany!" The difficulties of printing pen-and-ink sketches on a rotary press are fully described by Mr. Pennell, says the *Effective Advertiser*, but they are rather the difficulties of the uninitiated, in attempting a new process, than the real difficulties of the process or the fault of the machines. The men were new to the work, and would not take counsel of those who had passed through like troubles and got over them, as the *Chronicle* wished to keep its intention a secret, and so experiment after experiment followed. But it was not "until the stereotyper was in a rage, the printer in despair; not until the whole page had been reproduced by electrotyping in the fashion adopted for the finest magazines, that a satisfactory method was devised." And that was by stereotyping the letterpress, and leaving a space for an electrotype of the drawing to be placed in it. The drawings were line drawings, and ought to have printed from stereotype as well as the type did, and as many suchlike productions are printed. Mr. Pennell had the management of this great experiment of the *Chronicle*—great only from the size of the plates, for like work had been done on rotary machines for a long time past, the *War Cry* of the Salvationists probably leading the way in England, and on a Marinoni machine, many years ago. Mr. Pennell closes by saying: "In the past two years we have accomplished enough, however, to silence those critics who maintained that works of art had no place in a daily paper. I am not so sure that in the next sixty years the daily will not have superseded and surpassed the weekly and monthly." Mr. Pennell gives a long life to the weeklies and monthlies when he names two generations for the extinction of the weekly and monthly, and the reign of supremacy of the daily. Movements go fast in these days. The reigning weeklies of forty or fifty years ago are, in many instances, a thing of the past, or their character so much changed as to be practically a new creation.

The photo-engraver has led to the accomplishment of the feat of printing illustrations of events of yesterday in to-day's paper. During the Jubilee—and this happens daily in the *Daily Graphic*, the real leader of the movement in England—some of the drawings were not finished, says Mr. Pennell, until seven o'clock in the evening. They were given to the photo-engraver, who reproduced them before eleven; the blocks were put upon the machine and printed the next morning. "Possibly," adds Mr. Pennell, "they were not works of the highest art. But they were well drawn; they were well engraved; they were printed as well as they could be; and they were interesting and valuable, as showing what will be done in the very near future."

Something more will be done in the very near future. The very process block that has enabled this revolution to be carried out is likely to become a thing of the past in the very near future, if an invention for engraving plates from negative photographs bears out the expectations of its inventor. The invention has been patented in America, England, and elsewhere, and will shortly be placed, we understand, on the market. The invention is so extraordinary at first sight that, we understand, in the patent offices, where inventions are critically examined, the specification would not be received, because the process was deemed impracticable until the machine was produced and did the work as claimed. The examiners of patents might be sceptical in respect to a claim to reproduce a photograph, engraved on a printing plate, at the rate of "ten square inches in one-tenth of a minute!" with detail in it like a process plate! Mr. N. S. Amstutz, an electrical engineer in Cleveland, U.S., is the inventor. The apparatus and the process are alike—simple, as all good things are. It is an application of the principle that lies at the root of the phonograph, on which the sound of the voice—the motions made by sound upon a metallic diaphragm—can be engraved upon a sheet of wax, tinfoil, or like substance, and printed from, or rather the original sounds reproduced with marvellous fidelity, nothing being lost that the ear heard.

Mr. Amstutz takes a negative film and places that upon a cylinder, and upon the film is placed the material upon which the reproduction is to be made. The cylinder is revolved, and the cutting tool, which is placed close to it as it passes over the negative film, with its raised places for the white parts in the picture, cuts like indentations in the plate for the printers, and leaves the black surfaces for printing high and untouched. How sensitive the tool of the phonograph is, everybody who has heard "the sound of a voice that is still" knows, and the touch of the hand of the tool may be equally sensitive if properly and carefully made.

An exhibition of the process was given some time ago in Cleveland, and the *Cleveland World*, in describing the engraving machine, says, "It consists in first forming the subject to be reproduced with an uneven surface, and then causing a graver or cutter to automatically interpret in contiguous paths of cutting, which vary in depth in proportion to the lights and shades of such relief surface, the subjects upon another surface that is super-imposed upon the first subject. In operation Mr. Amstutz first produces a photo-gelatine sketch or other relief surface of the subject to be reproduced according to the kind of reproduction desired. The recording material is made of a sheet of celluloid or other yielding surface, and is secured around the cylinder and over the raised surface. The drum is rotated, and the reproducing material is caused to move under the cutter in a to-and-fro direction, according to the unevenness of the relief surface. An engraving is thus produced which may be used for surface or steel-plate printing or embossing, according to whether the cutter has a pointed or a blunt end. By this method Mr. Amstutz is able to preserve a maximum amount of detail with the smallest number of lines, thus producing printing surfaces capable of being used for the most rapid presswork upon daily papers. This detail cannot be secured by the present half-tone methods. It is impossible to skip any details with the coarsest lines. The process is entirely automatic, and the relief surface can be used repeatedly. The actual speed is ten square inches in one-tenth of a minute, making the process inconceivably rapid. Mr. Amstutz expects this machine to come rapidly into popular use, as it can be easily operated, and any relief surface can be reproduced. It does not easily get out of order, and is very substantial in its construction." So delicate is the operation of the machine, and so rapid, that the inventor, in the presence of the representative of the *Cleveland World*, in forty-five seconds took an exact copy of a portrait on a sheet of celluloid, which was only $\frac{10}{1000}$ of an inch in thickness, but the cutter reduces this thickness to $\frac{3}{1000}$ of an inch.

The purposes to which this new process may be applied are as various as they are important, and are not confined to the printing trade. They are thus described—"automatically cutting overlays for half-tones and other engraving"—a difficult but important matter, as Mr. Pennell states —"producing unalterable art transparencies; forming permanent carbon gravures; forming deep-lined half-tones for newspaper printing; automatically engraving from artists' sketches; producing intaglio or carving embossing dies; cutting photographic dies for moulding art tiles and other ceramic work; forming vignetted intaglio-line engraved portraits for bank-note printing, and cutting tint plates for colour printing." Such are described as some of the possible uses to which the Acrograph can be applied; and, if it can do the work spoken of in this report, other uses will, no doubt, be found for it.

Mr. Amstutz has been some years in perfecting the machine, but its cardinal principle he has lately been applying to telegraphing pictures; and, by what he calls his Artograph, it is said he sends "pictures as fast as the telegraph sends words, and permits of the use of an ordinary telegraph wire for the service." The process Mr. Amstutz employs for picture telegraphy is thus described: "That a picture, perfect in detail, may consist of absolutely nothing but parallel lines, will be a revelation to the general public, yet it is on this principle that Mr. Amstutz has established his invention for sending pictures by wire, the details of the picture depending on the width of the lines which make the lights and shades, and in that way work out the figures of the portrait or other picture. The instruments for sending these pictures are, it is said, not complicated, and can be provided—both sending and receiving instruments—at a cost not to exceed seventy-five dollars per set. They work automatically, being regulated either by clockwork or electricity, the former method being preferable, as it does not require special knowledge of electricity. The lines made are very small, running from forty to eighty to an inch. The picture to be sent can either be enamelled on a copper sheet, which is a rapid process, not consuming more than five minutes, or prepared on Mr. Amstutz's Acrograph—a pro-

cess which is even speedier. It is then wound on a drum and the clock-work put in motion. The feeding is automatic, and, as the needle passes over the variable photo surface, it will vary, break, and connect the electric current. At the other end of the line, the receiving material, placed upon a cylinder, like that at the sending end, interprets the variations, turning them from vertical into horizontal ones, and bringing out the lights and shades of the picture or photograph. When the lines are sufficiently coarse, the picture at the transmitting end has the appearance of being cut by vertical lines, while at the receiving end the picture appears to be composed of tiny squares, the perfection of whose details depends on the light and shades which go to make up the picture. The substance at the receiving end may be celluloid or chemically prepared paper. In case of celluloid, a graver must be used in order to cut into the receiving substance. In case of chemically prepared paper the lines will be brought out by its development. Mr. Amstutz believes that it is possible to receive the picture on a thin copper sheet covered with prepared chalk, known by artists as a 'chalk plate,' in which case a metal cast of the picture can be taken directly from the chalk plate, thus greatly facilitating the preparation of the photographs for the use of newspapers. Owing to the fact that celluloid will not stand the heat of stereotyping, the picture must be transferred by pressure, if used for newspaper work."

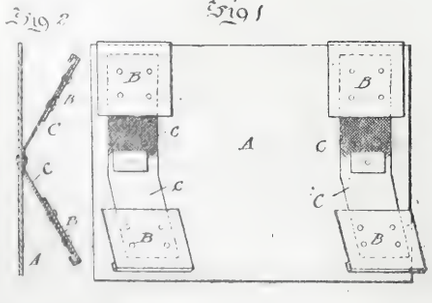
Mr. Amstutz in his specification proposes to use gelatine, celluloid, soft metal, or the like yielding materials for the engraving in a general way, and when an ordinary engraver's tool is used; but for engraving on steel a rotating cutter could be used. The tool travels slowly across the plate, as the cylinder turns as the tool on a lathe works, with change wheels for finer or coarser lines. The engraved plate will be like a Meisenbach plate, but with the screen lines only one way; in the Artograph the drawing will be cross-cut just like a process plate from a crossed screen. In half-tone plates with eighty lines to the inch, the distance from line to line is ·0125, and has a maximum depth of one-eighth of that distance; but in Mr. Amstutz's plates the depth of the cutting will be as ·005 is to ·00156 in the ordinary process plate. For ordinary newspaper work lines can be cut in the material in a direction opposite to that which the tool will cut in making the engraving, and thus the half-tone effect of the process plate can be got.

If we had not the marvellous effects of sound engraving in the phonograph, we might doubt the feasibility of the process; but, with that as an illustration of what can be done on the principle of the Acrograph, there is no room for doubt as to the possibility of the results with fitting machinery for such delicate work. The mechanical may, therefore, supersede the chemical; the tool of the Acrograph take the place of the acid; and plates be produced by tool-cutting rather than by acid "biting" The chemical process will thus give place to the tool of the engraver, used in a rotary ruling machine, with which the engraver is familiar, but while cutting straight lines leave uncut the design of the artist, and give a picture as finished as the screened plate of the process block maker.

Workers in the processes of the day must be prepared for the change. The world moves on, and they must accept with good grace the new developments of the future as they did those of the past. If the Acrograph fufils the hopes of its inventor—and there is good reason to believe it will—the new times may bring new methods and better and cheaper ones; and the old hands in the trade, if they are as prompt in taking up this new departure as they have been in moving forward in the past, may reap the harvest of the change, and find the mechanical handier, cheaper, and better than the chemical, good as it has been and wonderful as are its results in their hands.

HOLDING PHOTOGRAPHIC FILMS FLAT TO RIGID SUPPORTS.

In Mr. W. Kidston's invention movable clips or hooks are fastened to elastic or other extensible substance, which substances may be attached or unattached to the support or carrier, but when in position are placed

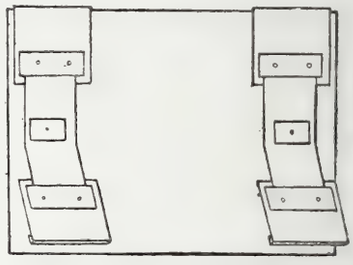


at the back with the short ends of the hooks or clips coming over the support to the front. The clips or hooks can be withdrawn independently, either before or after the film has been put in position on the support, and, when returned to their position, the hooks or clips grasp both the film and the support. This enables the operator to easily and simply adjust the film, which is then firmly held flat to the support.

Instead of being fastened to elastic or other extensible substance, the clips or hooks may be attached to the back of the support by a rivet through an arm or shoulder at the back of the clips or hooks, made and fitted in such a way that, when the hooks or clips are pulled back, they come clear of the support, and, when returned to position, they are parallel to the support and grasp both it and the film, in the same manner as a well-known form of clasp holds together the two sides of the frame at the opening in a hand bag or purse, and comes clear of them when pulled up.

The supports or carriers may be either single, to hold one film, or double, to hold two films back to back.

The clips or hooks can be fitted with a small pad made of indiarubber, or of a spring within the bend, so that, when the clips or hooks are pressed against the support from behind, they leave sufficient space for insertion



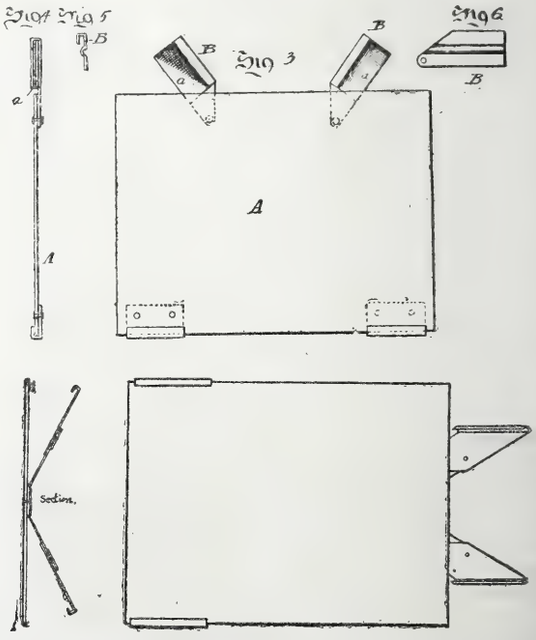
of the film between the front of the support or carrier and the turned-over portion of the clips forming the hook proper which confines the film at the front. When the pressure is released, the front portion of the hook grasps the film more firmly, and fits the apparatus for holding the films on thin roller celluloid or on paper, keeping them wholly flat and in "register."

When the clips or hooks are fastened to indiarubber, these pads can most conveniently be made by carrying the indiarubber forward inside the clips or hooks to the place where the bend begins.

The carriers may be used in dark slides, change boxes, or magazine cameras, or for holding the film during development.

Fig. 1 is a back view, and fig. 2 a cross section, of one form of carrier.

A is the flat support, and B are the clips or hooks for holding the film securely to the flat support. The clips are attached to a flat elastic band, C, which may be secured to the support. The clips or hooks can



thus be withdrawn from the support, and, when the film has been put in, they can be returned to their position, and will then hold the film firmly against the flat support.

Instead of being fastened to elastic or other extensible substance, the clips or hooks may be pivoted to the support, as shown in figs. 3 and 4. The clips or hooks can be fitted with a small pad of indiarubber, as shown at A (fig. 4), or the hooks may be formed with a slight bend inwards, as shown in figs. 5 and 6, so that, when the clips or hooks are pressed against the support from behind, there will be sufficient space for insertion of the film, and, when the pressure is released, the clips or hooks will press the film firmly against the flat back of the carrier.

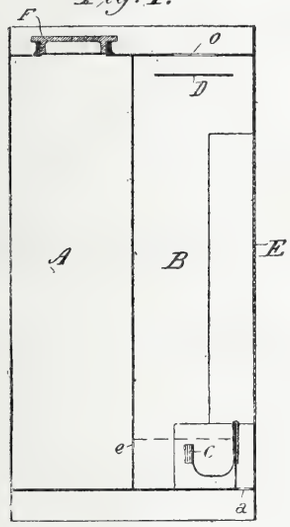
AN IMPROVED PHOTOGRAPHIC LAMP.

"I PROVIDE a lamp fed with a solid illuminant such as grease, tallow, or paraffin wax, or other suitable material, solid at ordinary temperatures, which," says Mr. H. G. Moberly, "will give a steady light for a considerable period without the necessity for replenishing the reservoir, and without any variation of the level of the flame, thus obviating the drawbacks attendant upon the use of liquid illuminants, or of candles or other forms of solid illuminants in which the supply is limited and the level of the flame varies.

"I construct my lamp preferably as follows:—

"The apparatus forms an upright cylinder of diameter approximately one-half the height, divided internally by a vertical curved partition into two chambers of unequal size, the larger whereof constitutes the reservoir for the illuminant, and the smaller is provided with a wick-holder. The walls of the cylinder are prolonged a short distance beyond the bottom thereof, and pierced with suitable apertures to admit air, which passes upwards through a short air passage arranged at the side of the smaller chamber furthest removed from the reservoir. The reservoir is provided with an air-tight screw cap at the top, through which the grease or other illuminant is supplied to it when required. About half an inch from the base of the reservoir a small aperture is made in the curved partition,

Fig: 1.



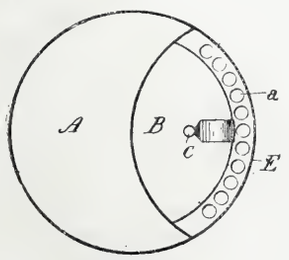


Fig: 2

through which the illuminant, when melted, flows into the base of the smaller chamber and feeds the wick. The smaller chamber has also an aperture at the top for the escape of the combustion products, shielded by an interior stop or plate in such a manner as to cut off any escape of light through the same. The open front of the smaller chamber is covered by a curved frame containing a non-actinic transparent or translucent material (a suitable material is that known as ruby fabric), which I prefer to place between two sheets of mica. The frame may be hinged to the body of the lamp, or it may be made to slide round it, so that access may be had to the chamber in order to light or put out the lamp, or when white light is required. An outer shutter is also provided in order to completely close the lamp when not in use.

"The lamp is operated as follows:—

"A suitable wick having been placed in the wick-holder, and the reservoir having been filled with solid illuminant, the base of the lamp is heated until the melted illuminant fills the bottom of the smaller chamber and saturates the wick. The lamp is then ready for use, at once or at any future time. When the lamp is lighted, the illuminant in the reservoir is melted by the heat of the flame, and flows through the aperture near the base of the curved partition, replacing that which is consumed by the wick, and maintaining the illuminant in the base of the smaller chamber at a constant level. This action (on the bird fountain principle) continues automatically so long as the lamp is burning and the reservoir contains any illuminant. When the lamp is extinguished the illuminant quickly congeals and the lamp is ready to be packed up.

"Referring to the accompanying drawing, in which

"Fig. 1 represents diagrammatically a vertical section, and

"Fig. 2 a view from below of my lamp:

"A indicates the fuel reservoir; B, the lamp chamber. The wick-holder, C, maintains the wick in constant communication with the melted illuminant passing from the chamber, A, into the chamber, B, through the aperture, *e*. The holes, *a*, admit air from below to the chamber, B, whilst the exit aperture, *o*, is so guarded by the baffle, D, that no light can pass through it to the outside. E indicates the ruby or other non-actinic translucent panel. The screw cap, F, closes the fuel reservoir."

CABINET FOR PRESERVING KODAK NEGATIVES.

MRS. SANDERS' invention relates to certain improvements in cabinets, adapted for preserving such small articles as photographic films and Kodak negatives.

Fig. 1 is a sectional elevation through a drawer.

Fig. 2, a plan of same or of a drawer having four compartments, the lower half being in section.

Fig. 3, a perspective view of a cabinet, fitted with three drawers.

The patentee takes a strip, *a*, of some fabric, such as tape, or a material of a greater or less stiffness, according to the requirements of the case, and secures one end in the bottom of a drawer, *b*, or a compartment of a drawer, as shown at the left-hand compartment of figs. 1 and 2, and at the lower compartment in the latter case. The other end is threaded through suitable slits in a piece of cardboard or other material, *c*, so that the end is left loose to project and form a tab, by which the cardboard may be lifted or the cardboard may be attached thereto.

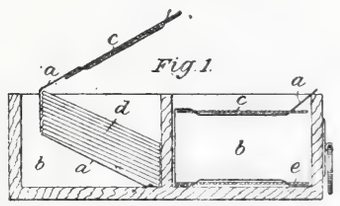


Fig. 1.

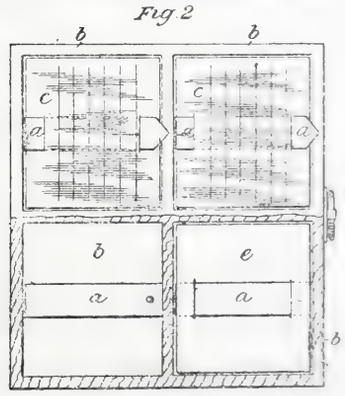


Fig. 2

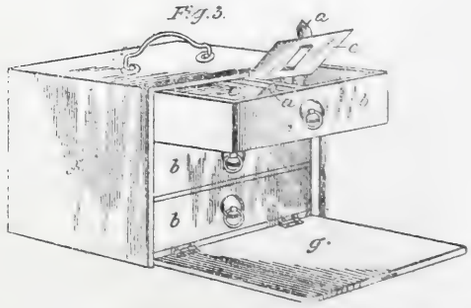


Fig. 3.

The films or other contents of the box may be laid on the tape, so that by lifting the latter they may be partially raised, as indicated at *d*, and be easily accessible. The cardboard may be used as a label to indicate the contents of the drawer or compartment, and may be suitably indexed or prepared for the purpose.

Where the nature of the article to be contained or held by the drawer or compartment renders it desirable, the tape, after being secured to the bottom of the drawer, may be first passed through a piece, *e*, of cardboard or suitable material, as shown at the right-hand side of figs. 1 and 2, and in the lower compartment in the latter case. This piece serves to better support the article, or the piece may be attached to the tape in other ways.

In fig. 3 there are shown three of such drawers contained in a cabinet, *f*, having a fall-down front, *g*, which may be arranged to be secured by a lock or otherwise to keep the drawers closed; or, in lieu of the door, a strap or band may be provided to hold the drawers closed, or each drawer may have a spring or like catch for this purpose.

PHOTOGRAPHIC EXPORTS.

COMPILED FROM THE CUSTOMS ENTRIES.

October, 1896.

Adelaide	£43	Brought forward	£3083	Brought forward	£6229
Alexandria	135	East London	82	Pattea	12
Amsterdam	14	Flushing	548	Perth	27
Auckland	333	Freemantle	315	Port Elizabeth	151
Barcelona	64	Ghent	64	Rangoon	11
Bombay	519	Gibraltar	13	Shanghai	250
Boulogne	84	Hamburg	124	Singapore	43
Brisbane	180	Hiogo	81	Stockholm	61
Buenos Ayres	160	Hong Kong	58	Sydney	954
Calcutta	705	Jaffa	10	Teneriffe	6
Canterbury	64	Kurrachee	55	Trebizonde	10
Cape Town	460	Lisbon	40	Trinidad	11
Christchurch	10	Madras	72	Vatomanary	5
Constantinople	6	Malta	70	Wellington	91
Colombo	29	Melbourne	1394	Yokohama	787
Delagoa Bay	17	Nelson	30	Zanzibar	31
Durban	260	Otago	190		
Carried forward	£3083	Carried forward	£6229	Total	£8679

October, 1897.

Adelaide	£624	Brought forward	£3708	Brought forward	£6072
Auckland	277	Constantinople	14	Otago	135
Barcelona	77	Cospoli	6	Penang	23
Bangkok	20	Durban	229	Perth	100
Batoum	8	East London	123	Port Elizabeth	241
Bermuda	60	Flushing	310	Santander	16
Bombay	807	Freemantle	53	Shanghai	179
Boulogne	145	Hamburg	136	Singapore	163
Brisbane	393	Hong Kong	119	Smyrna	18
Buenos Ayres	10	Hobart	48	St. Petersburg	160
Calcutta	603	Kurrachee	294	Stockholm	12
Campana	40	Lyttleton	25	Sumatra	167
Canterbury	21	Madras	50	Sydney	652
Cape Town	265	Malta	117	Thursday Island	15
Christchurch	115	Mauritius	55	Tokio	410
Christiania	41	Melbourne	731	Wellington	344
Colombo	202	Ostend	54	Yokohama	346
Carried forward	£3708	Carried forward	£6072	Total	£9053

AN AUSTRALIAN PHOTOGRAPHIC STUDIO.

OUR contemporary, *The Australasian Photographic Review*, gives the following description of the new "Eden" studios, in George-street, Sydney:—

The land, which is nearly a quarter of an acre in extent, bas been covered by a huge massive building of three stories and a basement. The frontage is sixty-six feet to George-street, and is divided into three parts, the centre being an open vestibule and the two others shops. The vestibule is tiled with white marble, with a blood marble diamond centre and a black border to relieve it. At the back of the vestibule there is a large shop window, which, like the fronts of the other shop windows, is fitted with heavy brass sashes, while the stalls are of marble, with thick brass letters, "Eden Studios," fixed thereon. The show-cases at each side of the vestibule are very handsome, the woodwork being of cedar, honeysuckle, and mottled kauri; two panels of the latter are specially admired. The whole of the glass has been specially bevelled with one-and-a-half-inch bevel, which gives the cases a very rich appearance. The whole ceiling has been specially modelled and stamped in zinc, and the effect is unique; it has a large centre cove, and from openings in this cove the vestibule will be lit, so that there will be no lights glaring in the eye when looking at the specimens. The decorators have not yet reached this ceiling, but Mr. Phil Goatcher, who has the contract for the decorations, says he will surprise Sydney with it. From the vestibule you step in a wide doorway and arrive at the seat of business; in front is a counter made of New Zealand woods, ebony, and marble, where the orders are taken, and at the left and right are arches into shops at either side, on the right the frame shop or picture gallery, 134 feet long, and on the left is the shop for b cycles, pianos, and sewing machines, &c., 100 feet long. Against the left wall is a handsome staircase, five feet wide. The risers are all white marble, while the treads are covered with heavy polished brass, each step having the name, "Eden Studios," cast in the brass. At the rear of this staircase is Mr Eden George's private office. Once on the first floor, spacious waiting-room, thirty-five feet by twenty feet, with front balconi a ladies' dressing-room, fitted with handsome lavatories and all co veniences, a gentleman's ditto, and then comes what is called a state vice-regal dressing-room. The furnishings are superb, and are of t costliest description. One centre *tête-a-tête* chair cost 35*l.*, the frame this chair being iron covered with the most beautiful majolica wo This chair, together with two tall lamp stands, costing 90*l.*, are the o ones of their kind in the colony, and formed the subject of the wind decorations of Rocke & Co., of Collins-street, Melbourne, during t Jubilee. The studios are also on this floor; both of them are very la and look well with their parquetted floors, while the lighting has be most perfectly arranged. There are also on this floor plenty of ot rooms for retouchers, enlargers, artists, &c. The top floor is devoted printing, finishing, and caretakers' rooms, while a step ladder leads the tower, six flights to the top. The tower is intended at a later d for a search light and other attractions. Indeed, the firm have alrea a large silk balloon made, and only await some one to make an asc from the tower. Down again over the Wilton pile carpets and th into the basement or cellar. In this cellar is a valuable new stock mouldings, about 5000*l.* worth. The cellar, extending under the wh building, is thoroughly dried by means of hollow walls and French drai and has an asphalted floor. From the other side of the street building presents a commanding appearance. The words, "Ed Photo Studios," have been specially made in blue and white enamel bricks, and set in sixty feet across the front of building. It is understo to be the intention of the firm to offer a prize of 5*l.*, to amateurs for best photograph of the new building; and, it may be stated, t photographic visitors to Sydney need have no diffidence in going to the premises, as Mr. Eden George has expressed his willingness to sh any brother photographer over the place, which is certainly well wor of a visit.

Our Editorial Table.

PHOTOGRAMS OF 1897.

By the Editors and Staff of the *Photogram*.
London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

THE volume before us closely follows the lines of its two predecesso As regards English "pictorial" photography, the selection examples for reproduction has been made with great judgment discretion, so that readers at a distance who have been preven from visiting the principal Exhibitions may rely upon having p sented to them an excellent idea of their leading features. Crookes' beautiful portrait of a beautiful woman, Lady M Lygon, possibly the most attractive piece of work at the Sal fitly forms the frontispiece. The block-maker and the printer h done their work exceedingly well. The literary contents incl articles by "Hallton East" (a very thin pseudonym) on "Pictu making by Photography;" Alfred Stieglitz on "The Photograp Year in the United States:" and C. Puyo on "Artistic Photogra in France." The editorial article, "The Work of the Year," fragmentary but readable reminder of the past year's work in var branches of photography, although here and there it is a little too in detail. The lengthy criticisms of the two great Exhibitions, writ in the present tense, and coming after the close of those Exhibiti are thereby robbed of a great deal of interest and value. We sugg that in a work of this nature, which is not meant to be ephemera would perhaps be more useful and informative to the reader if criticisms were confined to the pictures that were reproduced. T would clearly compel the inclusion of a number of examples wh call for adverse criticism, but it would obviate the necessity of m of the "So-and-So-is-represented-by-three-frames" style of critici not easily to be avoided in a weekly journal, but manifestly essential in an annual. Still, this is an easily remedied defect, wh does not detract from the care, the enterprise, and the good ta which have been lavished upon this most interesting and handso book.

THE KODAK PORTFOLIO.

The Eastman Photographic Materials Co., 115, Oxford-street, W.

As a souvenir of the Eastman Exhibition that has just closed, Company has issued a collection of photogravure reproductions photographs by some of the more prominent contributors to Exhibition. The feature of the collection is that the negatives w made in cameras of the Kodak series. Fourteen photographs in have been chosen for reproduction, those whose works have b thus singled out including Mr. H. P. Robinson, Mr. Craig Ann Mr. Davison, Mr. Pringle, and Mr. Calland. The souvenir t perpetuates the best characteristics of what in future we are s

ill be looked back to as a memorable exhibition. The photogravures ,ve been made by Messrs. Annan & Co., Glasgow, and the souvenir, hich is most beautifully produced throughout, forms a thoroughly arming work of art well worth preservation.

A Convention Group.

By F. H. Sanderson, Cambridge.

ISITORS to the Yarmouth Convention will recall the river trip Salhouse Broad and the very unconventional lunch on the grass 7 the waterside. After this extraordinary meal, at which knives id forks and plates were at a premium, Mr. Sanderson took a group the members with the steamer in the background. He has been)od enough to send us a print—an excellent one—from the negative ıen made. We shall treasure it as a pleasing reminder of a elightful day's outing.

The Amateur's Spotting-out and Retouching Palette.

W. Tylar, 41, High-street, Aston, Birmingham.

HIS set consists of a handy-sized porcelain palette, on which seven pig- ıentary colours are placed, while a small spotting brush is included. ;s uses include the spotting out of defects in negatives, prints or lms; blocking out skies and retouching enlargements. The idea is happy one on the part of Mr. Tylar, and we have no doubt that ıany amateurs will welcome the materials for spotting out, &c., put p in this convenient form.

News and Notes.

Photographic Club.—Wednesday, November 24, at eight o'clock. Travel- ırs' Night, *Liverpool to Alaska*, by Mr. Sydney Keith. Messrs. Newman & :uardia will exhibit some pictures by means of their kinematograph.

New Mode of Manufacturing Collodion.—According to a patented rocess by Schlumberger, it consists in dissolving the gun-cotton in ethyl- lcohol or methyl-alcohol, to which a small quantity of one of the following ubstances is added: Levulose acetic acid, oxalic acid, citric acid, tartaric cid, lactic acid, hydrochloric acid, or their alkali salts or earth alkali salts or inc salts soluble in alcohol, aldehydes of acetic acid and benzoic acid or heir acetates, ether of alcohol, with the above-named acids; picric acid and alicylic acid, nitro-benzine, chinoline, pyridine, urea, glycocol.

Professor Bernard has already succeeded in taking some wonderfully lear photographs of the moon by the aid of the great Yerkes telescope. His bject in doing so was to investigate the statement of Professors Janssen and lanksly that life exists on the moon. The pictures taken by Professor Bernard show that the surface of the moon is composed of craters of extinct olcanoes, the material closely resembling the fused lava found on the earth. From his investigations he declares that there is no trace of water, air, or egetation on the moon, and consequently no life can exist there.

Society of Arts.—The Society of Arts commenced its session (the 144th rom its foundation in 1754) on the 17th inst. with an address on *The Colonies: heir Arts, Manufactures, and Commerce*, by Major-General Sir Owen Tudor Burne, G.C.I.E., K.C.S.I., the Chairman of the Society's Council. There will e four meetings on successive Wednesdays before Christmas, at which papers vill be read by Professor James Douglas, on *The Progress of Metallurgy and Metal Mining in America during the last Half Century*; by Professor Leonard Waldo, D.Sc., on *The American Bicycle: the Theory and Practice of its Making*; by Bennett H. Brough, on *The Stockholm Exhibition of* 1897; by Samuel Rideal, D.Sc., on *The Purification of Sewage by Bacteria*. The irst course of Cantor Lectures will consist of three lectures, to be given on Monday evenings, commencing on the 29th inst., by Dr. Eugene F. A. Obach, F.C.S., on *Gutta Percha*.

Dr. Baraduc, in a paper read before the Society of Psychic Sciences, Paris, n the vital forces of man, said that, with an instrument of his invention, vhich he has named "biomètre," he has shown that the vital forces do not lepend on the laws of either heat or electricity. He constructed his biomètre n the principle of Fortin's dyanomètre, absolutely adiathermic and adi- lectric. A pointer like the hand of a watch is supported over a dial inside a glass vessel isolated by three compact layers of mica, albumen, linen cloth, nd collodion. Dr. Baraduc says, if a person touches the instrument, the and indicates the vital forces. Experiments have demonstrated to the in- ventor that the movements of the hand of his biomètre corresponded with the tate of mind of the person. Thus the hand is attracted by a person feeling happy, but is pushed backwards by a person suffering grief. Dr. Baraduc contends that he has achieved even more—that he has succeeded in photo- graphing the human vital forces. He declared to the members of the Society of Psychic Sciences that, by force of will, a person seated in a completely dark room, in front of a photographic camera, had succeeded in producing a clear impression on a photographic plate. Mereover, by placing photographic plates on a human corpse in a completely dark room, he remarked that they received an impression from the vital forces three hours after death. Dr. Baraduc concludes that there exists in a living man a vapour of life, which is he quintessence of movement. He cannot determine the cause of it. In his opinion that movement must be connected with the vibrations of the soul, and be palpable intelligence. Dr. Baraduc concluded by calling the attention of his hearers to the similarity between the solar photosphere and the vital atmo- phere of man,

To facilitate the study of X rays, A. Imbert and H. Bertin-Sans had a special kind of photometer constructed by MM. Ducretet and Lejeune, which consists essentially of a fluorescent screen, over which is laid a coarse grating of lead wires and a prism of aluminium. When the X rays examined are feeble, they are only able to penetrate the thin end of the prism, and no shadows of lead wires are visible on the screen except under the thin end. This happens when the vacuum tube is exhausted just enough to give X rays. As exhaustion proceeds, more lead wires become visible, and, when the tube is on the point of becoming non-conducting, the illumination over the whole of the screen is uniform, and the shadows stand out with equal sharpness. At this stage, indeed, aluminium becomes perfectly transparent to the rays, and so do the bones of the hand. This type of rays is particularly well suited for the radiography of the deeper-seated anatomy.—*Comptes Rendus.*

Kaolin and china clay are terms often employed in technical publications as if they were interchangeable, says the *Engineering and Mining Journal.* Kaolin is mineralogically a simple hydrous silicate of aluminium, which is, indeed, practically the composition of china clay. Kaolin is seldom found pure, and it is usually necessary to subject it to some kind of mechanical treatment to free it from the impurities which would be objectionable in pottery-making, for which purpose by far the greater part of the production is employed. In the principal American deposits the yield of the clean material is only about thirty-three per cent. of that which is dug. In the industry the term kaolin is used to designate the crude material, while the finished product is referred to as china clay. This use of the term may not be justified mineralogically or linguistically; but, since it has become established in the trade, it is better to refer to the finished product as "china clay," and not as "kaolin," which, of course, leads to more or less confusion.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
22	Bradford Photo. Society	*Enlargements and How to Make them.* T. Heaps.
22	Camera Club	*Electric Waves.* A. Campbell, B.A.
22	North Middlesex	*Behind the Scenes in Popular Journalism.* George Newnes, Ltd.
22	Richmond	*Developers:* (1) *Pyro.* J. D. Gibson.
23	Birmingham Photo. Society	*Wanderings in South America.* F. Sternberg, F.R.G.S.
23	Brixton and Clapham	*The Making of Enlarged Negatives by Artificial Light.* G. W. Welham.
23	Hackney	*Lantern-slide Making.* John H. Gear, F.R.P.S.
24	Borough Polytechnic	*Photography with the Microscope.* E. E. Hill, M.R.Mic.S.
24	Croydon Camera Club	*The Gum-bichromate (Photo-aquatint) Process.* James Packham, F.R.P.S.
24	Croydon Microscopical	Annual Soirée.
24	Kingston-on-Thames	*Negative-making.* John A. Hodges.
24	Leeds Camera Club	*Acetylene and other Gases as Used in Photography.* Mr. Watkinson.
24	Leytonstone	Ladies' Lantern Evening: *Behind the Scenes of Popular Journalism.*
24	Photographic Club	*Liverpool to Alaska.* Sydney Keith.—Messrs. Newman & Guardia will Exhibit some Pictures by Means of their new Kinematograph.
24	Shropshire	Prize Slides.
24	Southport	*Some Practical Photographic Dodges.* Cecil M. Hepworth.
25	Camera Club	*Photographic Action Writ Large: A Kurvey-linear Conversation on Corn.* Professor Armstrong, D.Sc., F.R.S.
25	Liverpool Amateur	*A Holiday in Germany.* William Harvey.
25	London and Provincial	Open Night.
25	Woolwich Photo. Society	*The Carbon Process for Beginners.* Fred. W. Machen.
26	Borough Polytechnic	*Paper Negatives.* P. C. Cornford.
26	Croydon Microscopical	Conversational Meeting.
26	Stafford Photo. Society	Prize Slides.
26	Wakefield	*Pictorial Photography.* A. Horsley Hinton.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 11,—Mr. F. B. Grundy in the chair.

Mr. E. H. Bayston sought for an explanation of some peculiar pencil-like markings on some bromide prints which he handed round. He found that ferricyanide removed them, but it was not in all cases practicable to apply this cure.

Mr. Philip Everitt enumerated a number of likely causes, such as shearing stress, pressure in cutting the paper or at some other time. Whatever the actual cause, he, with other speakers, ascribed the marks to some physical action.

Mr. R. P. Drage recalled a similar sort of thing. He traced this to the use of a dish which had contained some iron, particles of which had remained behind.

A discussion took place upon the influence on photographic work exerted by the Pall Mall show and the Exhibition at the Dudley Gallery, in which Mr. Welford, Mr. Mackie, Mr. Everitt, Mr. Drage, Mr. Teape, and others took part. Some inclined to Mr. Everitt's view that the *pictures* were to be found at the Salon and the *photographs* at Pall Mall; while other speakers, as opposed to this view, agreed that this year's Salon was far behind its predecessors, and spoke in favour of the older show. Like Mr. Teape, who deprecated excessive softness in the case of portraits, which were at the time

under discussion, favouring the happy medium with just sufficient softness to give a suggestion of fleshiness, several speakers objected to the extreme views of certain workers, and to the tendency to initiate the low tones used by certain painters. Opinion was divided as to whether the supposed influence of the Salon towards raising the standard of pictorial excellence was real, or, at any rate, so great as some would infer, but it was agreed by two or three who offered their opinions on the subject that the Pall Mall show had shown greater progress in the same period than had the Salon.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE Second General Meeting of the above Society was held on Thursday evening, November 11, at the rooms, 44, Mosley-street, the President (Mr. James Wood) being in the chair.

After the minutes of the last meeting had been read and confirmed, Mr. H. M. Whitefield gave a demonstration on the

STRUCTURE AND USE OF THE OPTICAL LANTERN.

He said that the chief object in regard to the lantern was that of taking pains with regard to small matters, and these eventually make one grand result. Ninety-nine per cent. of the failures were due to faulty manipulation or inexperienced manipulators. Mr. Whitefield thought that most of the optical failings were due to a faulty condenser, *i.e.*, a condenser of faulty construction. By means of drawings, he showed how a condenser should be constructed, and how to adapt it for certain work. There were various shapes of condensers, but the most popular form was considered to be the simplest and best for general work. He illustrated the way in which the rays proceeded from the point or source of light, and how they passed through the two elements of a condenser. The lecturer said that the best distance for the light from the condenser was a little more than half the diameter of the condenser. Thus, supposing the diameter to be four inches, then the best position for the light would be two and a quarter inches away from the back element of the condenser. If it is brought nearer, it is unsafe, as the heat would cause the glass to expand unequally, and in many cases a breakage would be the result. Also some of the rays would be reflected from the surface of the glass, and there would be loss of light on the screen. By means of a diagram, the lecturer showed that a condenser of four and a quarter inches diameter was better than one of either four inches or four and a half inches. The real starting point in constructing an optical lantern was to obtain a bundle of parallel rays from the back lens of the condenser, and then to add a front lens to converge the rays on to the lantern slide. The popular form of condenser (which originated in America) was first made by splitting a double convex lens in two in a *vertical* position, thus making two similar halves. If the modern lanternist wishes to be able to use projecting lenses of varying foci, he must be equipped with different front elements for his condenser to suit these foci. Mr. Whitefield then explained why a sharper picture was obtained when using the limelight than when an oil lamp was the illuminant. The film of the slide consisted of small particles of silver bromide or chloride, and each of these threw a shadow on the screen. Thus from an oil lamp each particle was lit by many different rays from all parts of the flame, and consequently on the screen one shadow overlapped the other, whereas, with the limelight (being much nearer the theoretical "point"), this defect was much lessened. The lecturer said that it was essential that the light, the condenser, and the projecting lens should be in the same straight line; also that the screen must be at right angles to an imaginary ray of light passing through the centre of the lantern. He also explained the blow-through and mixed jets, and gave a practical demonstration as to the regulations of these so as to obtain the best light.

A vote of thanks was passed to Mr. Whitefield for his very interesting and instructive lecture.

Croydon Camera Club Lantern Show.—The thirty-second public show of the Club was held on Wednesday, the 10th inst., at the small Public Hall, with every sign of popular favour. The first part was filled by Mr. R. B. Lodge, who displayed a perfectly unique collection of rare British birds taken in, or by, their nests. Many of these—such as the puffins, guillemots, kittiwakes, cormorants, and terns—were taken at the Farne Islands, which are specially preserved from spoilation in order to permit of the breeding of the above and other rare or useful or beautiful birds. The East Coast afforded Mr. Lodge a number of pictures of migratory birds, notably waders, and of some significant drive-nets, used for snaring birds wholesale many being thus butchered for women's headgear, such as the *matinée* hat. Some delightful chapters of bird life in the Dutch and Spanish marshes concluded a lantern lecture which, from first to last, was brimful of interest—photographic, pictorial, and ornithological. Hearty and sustained applause greeted the lecturers' name when the PRESIDENT tendered Mr. Lodge the Club's thanks.

COLONIALS AT CROYDON

opened the second part of the entertainment. This was illustrated by a complete series of snap-shots of the procession by Mr. Hector Maclean. Mr. Kough contributed bonfire views of Addington, as did Mr. Isaac, who besides working the lantern, showed several Portsmouth and Spitehead slides. Mr. Roger's clever firework slide created much appreciation. Finally came Mr. J. Smith's celebrations at Fittleworth.

LONDON ON DIAMOND DAY

followed. It was entirely illustrated by Messrs. Chadwick Taylor, and S. Carley. It would be hard to say which of these gentlemen's scenes were best; both sets gave the greatest satisfaction. A portrait of the Queen coloured by Mr. Alfred Underhill, concluded the Jubilee subjects.

MR. D. P. ROBERT'S MOVING PHOTOGRAPHS

ormed the third part, and, judging by the frequent plaudits and by the prolonged applause when the audience's thanks were tendered to him, they must be pronounced a striking success.

Bolton Mutual Photographic Society.—There was a large gathering of members and friends of this Society at the Bolton Technical School on Thursday evening, November 4, on the occasion of a lecture and practical demonstration on

PHOTOGRAPHIC ENLARGEMENTS,

by Councillor G. H. B. WHEELER, of Manchester. Mr. Wheeler, who is an expert in the subject, and author of numerous photographic works, described and demonstrated his methods of working, the apparatus, illumination, most suitable negatives, and various developers. One interesting feature was development of the latent image by saturating a large camel's-hair brush with developer and locally building up the image, giving the artistic worker much greater control over the final effect than was possible by the ordinary methods. The lecturer said that, as he was unable to go over the whole ground in the time allotted, he would present the Society with a copy of his work on *Photographic Enlargements: How to Make Them*, which contained methods and formulæ. Mr. Wheeler was heartily thanked at the close of the demonstration. The Society is in a flourishing condition, and since the last lecture eleven new members have been enrolled. It was also decided that the Society should become affiliated with the Royal Photographic Society.

Bradford Photographic Society.—Mr. Percy Lund occupied the chair at the meeting on November 8, when Mr. GODFREY BINGLEY, of Leeds, delivered a lecture, which proved one of the best which has been given before the Society this session. Mr. Bingley took as his subject

A SURVEY OF YORKSHIRE,

and, in commencing, pointed out the great value of having such a definite aim as the surveying of one particular county, or one particular part of it. He then proceeded to show a number of slides taken by himself of some of the most charming spots in Yorkshire, along with a series of photographs of geological formations, which could not but be useful to those who were making geological or antiquarian knowledge their study. Among other pictures noticeable for their completeness and utility in connexion with the purpose for which they were taken we may mention a particularly fine set of pictures of the Yorkshire coast from Whitby to Flamborough, showing the various strata, &c., while some equally noticeable were a number of rock, scar, and fell pictures of the Ingleton district. Artistically speaking, many of the slides occupied a high position, and in every case almost suitable clouds were included. Among the most striking effects, a *finis* picture of a red sunset, although daring in conception, was really very effective.

Dundee and East of Scotland Photographic Association.—The monthly meeting of the Dundee and East of Scotland Photographic Association was held on Thursday, November 4, in Lamb's Hotel, Dundee, Professor Stegall in the chair. The feature of the evening's proceedings was a lecture, entitled

LANTERN-SLIDE MAKING,

lent by the Royal Photographic Society, in virtue of the affiliation of the Association to that body. The lecture, which was of a highly practical and instructive character, was read by the SECRETARY (Mr. V. C. Baird), and was illustrated by a splendid collection of fifty slides, consisting chiefly of landscape and architectural subjects. This was followed by an interesting exhibition of members' slides, including views in the Scottish Highlands and in Brittany. It has been arranged to hold the annual *Conversazione* in the Victoria Art Galleries on December 23. On that occasion one of the small galleries will be occupied by an exhibition of photographic work by the members, supplemented by contributions from professionals, including leading artists in the photographic world. The Exhibition will afterwards be opened to the public for a period not yet fixed. It is expected to be of a high-class and interesting character, and, as a number of years have now elapsed since the holding of such an Exhibition in Dundee, it ought to prove very popular with the citizens.

FORTHCOMING EXHIBITIONS.

1897.	
November 22–27.....	Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.
,, 29, 30.....	Durham City Camera Club. R. Hauxwell, The Avenue Durham.
December 9–11	Aintree Photographic Society.
,, 28–Jan. 1 .	Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough-road, S.E.
1898.	
January 17–22.....	Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
,, 29–Feb. 26 .	Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.
January–February...	Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30	National Photographic and Allied Trades Exhibition A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14.....	International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

Patent News.

THE following applications for Patents were made between November 1 and November 6, 1897:—

DEVELOPING TRAYS.—No. 25,291. "Improvements in or connected with Photographic Developing Dishes or Trays." C. A. MOODY and M. WILLIAMS.

LOURED REPRODUCTIONS.—No. 25,433. "Improvement in the Obtainment of Coloured Reproductions or Prints from Photographs." W. J. HOLT.

OTO-TELESCOPE.—No. 25,459. "Photo-telescope." J. A. CORBITT.

ANGING BOXES.—No. 25,550. "Improvement in and relating to Photographic Containers or Changing Boxes." Communicated by A. & J. Pipon. D. CLERK.

IMATED PHOTOGRAPHY.—No. 25,625. "Improvements in or relating to Apparatus for Taking or Displaying a Series of Photographic Images in Rapid Succession." E. F. MOY and G. H. HARRISON.

TIFICIAL LIGHT.—No. 25,657. "Improvements in Portraiture with Artificial Light." P. BOYER.

JUSTING LENSES.—No. 25,675. "Improvements in the Adjustment and Attachment of Photographic Lenses to Cameras." E. G. CAMP.

UTTERS.—No. 25,710. "An Improvement in Speed Regulator for Photographic Shutters." W. STANBURY.

OOLS.—No. 25,782. "Improvements in Spools and the System of Mounting and Spooling Sensitive Photographic Films." J. E. THORNTON.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ACETYLENE AND FIRE INSURANCE.

To the EDITORS.

GENTLEMEN,—Your article on the above matter has only just come to ıy notice, and, as a user of acetylene in the lantern, I note you think it omewhat your duty to draw your readers' attention to the exact facts as egards the fire insurance and the trouble that might arise through the se of acetylene.

Now, as an admirer of the new illuminant for lantern work and for hotographic purposes, I certainly think you should also have pointed ut that compressed oxygen is subject to exactly the same conditions as n acetylene gas generator.

Of course, were damage caused to a building or property through the se of acetylene, no insurance company would be liable, but neither ould they if a gas cylinder exploded; so that the lanternist runs no nore risk than when using limelight. I merely wish to draw attention o these facts, as I have proved acetylene to be a most useful light for he lantern, and I think it should be allowed a fair chance with other luminants, for, with properly constructed generators which have been horoughly tested (such as the Incanto, which I have used quite 200 imes), there is absolutely no danger to be apprehended.—I am, yours, &c.,

SIDNEY G. P. CORYN.

21, *Cromwell-road, Wimbledon, November* 11, 1897.

THE SALON.

To the EDITORS.

GENTLEMEN,—I paid but one visit to the Salon this season, and that a late one, or I would have sent this disclaimer before. I write to complain of the, well, adjective "cheek" shown by the "outsider"—as Mr. H. P. Robinson styles the Hanging Committee—in dealing with one of my frames.

I found it covered with brown paper nearly close up to the picture, my gold and black frame being entirely hidden. Now, my idea of a Hanging Committee's courtesy to an exhibitor from whom they differ in a point of taste is that they should have asked me to reframe the picture, if they wanted to hang it but disliked my treatment of it: or, failing that, to reject it altogether. I was not asked in any shape or way, and I have been assailed by acquaintances and friends for my quaint eccentricity in thus sending in a picture. No one has been able to believe that this treatment was a purely gratuitous one on the part of the Salon.

I think that the Salon Executive should have asked their hanger how he came to find room for such an atrocity of a frame on his walls as that brown-paper-covered thing; and, when they found that that special 'effect" was due to *his* unaided genius, I think they should have asked if I had first been consulted, and then have sympathised with my possible point of view, and have either the brown paper or the picture removed the former to my preference certainly), if they could not bring themselves to ask me to reframe it, as they evidently desired to hang it somehow.

Perhaps some official will explain to whom my thanks are due for this startling display of "taste" and impertinence?—I am, yours, &c.,

FREDERICK H. EVANS.

19, *Buckingham-street, Adelphi, W.C., November* 12, 1897.

To the EDITORS.

GENTLEMEN,—Recent correspondence on the Linked Ring and its Exhibition in your columns has been to some of your readers at least, amusing reading. When, last year, I said that the disproportion that existed between the number of works shown by members and non-members respectively was not due alone to the relative merits of their works, as the prospectus implied, but that some exhibited because they were members, and non-members' work was simply accepted so far as there might be space, under quite different conditions from those printed on the invitation form, I was called some very hard names by those who contended that merit, and merit alone, secured admission, and that the absence of merit must inevitably lead to rejection.

It is therefore agreeable, and even amusing, to read in Mr. Davis's letter that he resigned his membership because he, from his experience there, "doubted the honesty of their transactions," and "saw no possibility of reform;" and also, that, "when members' pictures in large numbers had been accepted, considerable haste was shown in passing through those of outsiders."

All this is delightful, and far from doing the injury to the Royal Photographic Society that this fraternity originally intended, their methods, and equally their results must, I think, by the contrast, influence opinion largely in favour of the "Royal," and materially improve its position, and cause its Exhibition to be regarded as the only representative one of the year.—I am, yours, &c., HENRY W. BENNETT.

Hastings House, Norfolk-street, London, November 10, 1897.

MR. H. P. ROBINSON AND THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—I am afraid my good friend, Mr. H. P. Robinson's memory has served him falsely. He intimates that he has not for two years been responsible for the hanging at the Photographic Salon. We know, of course, that he has not been so this year, and last year he did not undertake the general hanging, but he certainly superintended the hanging of his own pictures then.

It seems strange that, with the galaxy of talent existent among the members, no one was found capable of hanging the frames except a decorator. There are, at least, a dozen members who could and would have given the time to it, and they are independent men who would have decently subordinated the position of their own exhibits to the general interests of the Exhibition.

Mr. Robinson reproaches me with density in not seeing that his reference to "honesty" was a jest—a very cutting one, I am afraid, for his associates; but is it not rather he who is dense in not perceiving that I have seized on his humorous allusion simply as a useful peg?—I am, yours, &c., HENRY E. DAVIS.

Camera Club, Charing Cross-road, W.C., November 12, 1897.

IS PHOTOGRAPHY A PLAYED-OUT PROFESSION?

To the EDITORS.

GENTLEMEN,—The article appearing in last week's BRITISH JOURNAL OF PHOTOGRAPHY entitled, *Is Photography a Played-out Profession?* I class with the most useful and practical contributions to your valued journal. The repeated growls as to the bad times and the depreciation of the profession makes young beginners, like myself, quite down-hearted at times, and we think that, if these things be true, what a poor look-out for our future. During the five years I have had a business things have prospered, and I also call myself a "busy man." Now, the remark of your correspondent raises my hopes that, if I continue to look at it as a "downright absorbing pursuit," success awaits me.

The remarks on the show window, choice of furniture, and arrangement of studios, &c., are most acceptable, and I sincerely thank him for his hints, feeling sure many other young photographers will be gratified by perusing the article.—I am, yours, &c., ALFRED YALLOP.

197 *and* 198, *High-street, Gorleston-on-Sea, November* 13, 1897.

THE EASTMAN EXHIBITION.

To the EDITORS.

GENTLEMEN,—I am not acquainted with *all* of Mr. H. P. Robinson's works, although I have seen a good many of them at various times and places, and am willing to accept Mr. Frank M. Sutcliffe's assurance that he is not the author of the picture entitled *Listening to the Birds*, but the Eastman Company's catalogue on page 11 most distinctly says that *he is*. It was from the catalogue (while looking at the picture) that I obtained my information as to its authorship, so the mistake is not mine.—I am, yours, &c., H. HALLIER.

41, *High-street, Sydenham.*

PARIS, ROANNE, AND DUNKERQUE EXHIBITIONS.

To the EDITORS.

GENTLEMEN,—I should be glad if you would afford me the opportunity of explaining the cause of delay in the return of frames sent by British exhibitors to the above Exhibitions.

The first trouble has arisen over the French duty. In asking Paris to forward on to Roanne, Paris asked for the amount of duty. For the purpose of an exhibition, framed photographs have first to pay a duty which is returnable within a certain time limit, and provided the frames are returned to the original senders. Therefore, to go to Roanne, the duty

had to be paid. Upon receipt of this information, I circularised the exhibitors, several of whom objected to pay the duty. I thereupon concluded that it would be cheaper in the end that the frames should be returned to me in London, and I asked Paris to do this.

Meanwhile, however, Roanne settles with Paris on their own initiative, and the frames go to Roanne *en masse*, and from there they proceed to Dunkerque.

From Roanne comes a demand for a sum of money paid by them to Paris. When at last I get this cleared up, I find it is made up of so much for duty, and so much for carriage paid by Paris for the journey London to Paris. I objected to pay the duty absolutely as Roanne made their own arrangements. As regards the carriage, I had paid that in London. Virtually, then, I owed nothing to Roanne.

With regard to Dunkerque, it appears that they had to undertake not to part with the frames until Roanne had been settled with, and, as I declined, in the interests of my British exhibitors, to pay any wrong charges, the frames have remained at Dunkerque. I may add here that I have offered any assurance they might desire to obviate the detention of the exhibits, without avail, however.

Another perplexing point was that the demand from Dunkerque was *exactly* the same amount, even to the odd centimes, as that from Roanne, which, considering the fact that one was made up of carriage London to Paris and Customs duties, whilst the other was for carriage only Roanne to Dunkerque, was, to say the least of it, very curious.

However, I submitted the matter to friend Cecil Hertslet, who is at the Consulate General at Havre, and have acted upon his advice. I have settled outright with Dunkerque, and, as Roanne now admit they could not claim the duties from me under the circumstances, I have paid them a certain sum towards the duties, and sent the receipt for carriage London to Paris. It now only remains for Roanne and Paris to fight that carriage question out. Meanwhile I trust Roanne will advise Dunkerque to forward the exhibits immediately, and I hope to have them about the time this letter appears. I will then issue a circular to the British exhibitors and clear up the whole matter.

Personally, I am most desirous of doing this, as my new undertaking will compel me to withdraw almost completely from the photographic world, for a time at all events, and I am naturally anxious to get the matter settled off. I would just add, in conclusion, that, so far as I know, the Dunkerque commemorative medals have not been issued, and, as regards Roanne, I should be glad to hear from those who have not received their awarded or commemorative medals.

WALTER D. WELFORD.

THE BICHROMATED GUM PROCESS.

To the EDITORS.

GENTLEMEN,—I am directed to inform you that the Affiliation Committee have received a promise from Mr. Packham, of Croydon, to give a lecture and demonstration of the *Gum-bichromate Printing Process* before the members of affiliated societies at the Photographic Club, Anderton's Hotel, Fleet-street, at eight p.m., on December 1.

May I ask you to give this publicity in your columns, and to say that the Photographic Club will give a cordial welcome to all the members of affiliated societies who are desirous of being present on that occasion?—I am, yours, &c., R. CHILD BAYLEY, *Secretary*.

12, *Hanover-square, London, W., November* 12, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Alfred Brookes, 59, Piccadilly, Manchester.—*Three photographs of J. H. Derbyshire and P. F. Cavill.*

W. G. Coote, 10, Holmefield, Sale, Cheshire.—*Photograph of the effects of a gas explosion at the Regent Hotel, Regent-road, Salford, Lancashire.*

AJAX.—Probably Messrs. Fuerst Brothers, 17, Philpot-lane, E.C.

R. W. S. (Wimbledon).—We do not undertake to answer correspondents privately, and, as you did not wish a reply through this column, your letter was, of course, consigned to the waste-paper basket.

WILLESDEN PAPER.—This, if still made, may be had of the Willesden Paper Company, Willesden, N.W. We are not aware if the Company has a London warehouse, but we think it had, somewhere in the neighbourhood of Cannon-street. The paper is quite waterproof.

RADIOTINT.—MAC says: "I should feel much obliged if you would kindly give me the name and address of the firm (or London agents for the firm) who work 'Dansac's Colour Photo-process of Selective Absorption.'"—In reply: The address of the Company is Great Winchester-street, E.C.

NEGATIVES FROM NEGATIVES.—J. H. says: "Could you inform me—1. I can make a duplicate negative by printing it from another in a fram 2. What exposure would it take? 3. Would it appear in the developi as an ordinary negative?"—In reply: 1. Yes. 2. Approximately sev or eight seconds. 3. Yes.

MARBLED STAINS.—H. BAINS.—The marble-like stains arise from the print before toning, being washed in a dish, or water, contaminated wi hyposulphite of soda, or some other chemical, sulphocyanide potassium, for example. When such stains as these are on the print there is no way of removing them.

LANTERN.—C. GARDNER. It is, as we have often said before, against our ru to recommend any particular maker's goods. Each of the make mentioned in your letter is good, and you may rely upon getting fu value for your money from either house. You must, however, bear i mind that the price you propose to pay is very low, and a first-cla apparatus must not be expected for that sum.

BACKGROUND.—S. H. GOOD. Brown paper may be had of any length, an about five feet wide. It is an excellent material for cheap background It can, of course, be coloured in distemper to any colour, and can then sketched upon for scenic backgrounds. Used as it is purchased, makes an excellent plain background for many purposes. The paper not kept by all stationers, but is supplied by all upholsterers under th name of carpet paper.

METHYLATED SPIRIT.—W. GOTHARD writes: "Will you please say where can procure the regulations with regard to the privileges and restrictio against the use of methylated spirit, 64 o.p., the old kind witho mineralised naphtha?"—An application to the Excise office of yo district will give all the information as to how to obtain a licence t purchase the spirit free from the mineral spirit. No charge is made fo the licence, but certain regulations have to be conformed to.

VALUE OF A PHOTOGRAPH.—E. SEAMAN says: "I should be glad to kno your opinion as to the value of a very old photograph of Crowlan Bridge, Lincolnshire, with a dozen very old men sitting upon it at th time it was taken—one of them is just upon his 100th year. The ol bridge has been pulled down, and a substitute built in its place, which not so historic as the one I have; also, there is only one more photo graph of the same, taken about fifty years ago. What value for lanter slide or illustrated paper?"—In reply: Probably not more than a fe shillings.

EMPLOYER AND EMPLOYÉ.—PRINTER. Your case is certainly a hard one, an we are sorry to tell you that you have no redress. You had no agree ment for the year's services, and were a weekly servant only. If you employer gave you a week's notice, that is all you are entitled to. W regret to say that many unscrupulous employers make verbal promise —agreements they call them—for a year's services *certain*, and then di charge the *employé* when the bad weather sets in or business become slack. Such treatment of assistants, who accept a small salary on th promise of employment through the winter, is, to say the least of i disreputable.

STUDIO.—ZETA says: "It is my intention to erect a studio, but, before doin so, would like to know the most convenient size for portrait and gener work. Would you give me the length, width, height of eaves and ridge and proportion of glass, also the correct position to fix same whe built?"—A length of from twenty-six to thirty feet will be a convenien length, for general professional portrait and general work, with a widt of thirteen to fifteen feet, eight feet at the eaves, and twelve or thirtee at the ridge, will be good proportions. Five feet at the ends may b opaque and the rest glass. We should say, Run the studio east an west, so as to use a north light, if that side be available.

STAINS IN PAPER.—R. ANSCOMBE says: "Should feel obliged if you wou give me your opinion on the markings on the strip of paper enclose I have been experimenting by making prints on home-salted nitr silver paper, and the results are very good, but I am anxious to kno whether they are properly fixed. The formula I used says give ther ten minutes in the hypo; but, to make sure, I gave them half an hour t forty minutes, then dried them off by the fire. On looking throug them, they have the markings as if they were not sufficiently fixed. gave them two hours' washing. An answer would oblige."—The pape —rough drawing paper—is one evidently not suited for photograph purposes. It apparently contains something that forms a compoun with the silver, which is not removed by the fixing solution. We are of course, assuming that the hypo solution was employed of the usua strength.

WATER.—H. T. LAWSON writes: "The water supply of this town is draw from a deep well. It is very free from organic matter, but analys shows that it contains forty-four grains of salt (about) to the gallon. should be glad if you will inform me if this is at all deleterious to th carrying out of one's work. Of course, I should use distilled water fo a nitrate bath, but does it affect the tones usually obtained by the gol sulpho-ammonia bath? My *impression* is that it slows the action an renders it incapable of giving good purple tones (this apart from qualit of negative). Would it be necessary to make chloroplatinate of potas toning bath with distilled water? If this condition of the water is difficulty will you advise me how to overcome it, or, at least, how t avoid it?"—Forty-four grains to the gallon seems a large quantity, bu we presume it means salts of different kinds, and not what is generall known as salt, that is, chloride of sodium pure and simple. Withou knowing the precise nature of the salts, supposing them to be *salts*, w cannot offer a definite opinion. The experiment might be tried of makin the chloroplatinate with distilled water and noting the result.

*** Owing to our brief absence from town, several answers to correspon dents and other communications are unavoidably held over.

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NOTICE OF REMOVAL.

On January 1, 1898, the Offices of the "British Journal of Photography" will be Removed to No. 24, Wellington-street, Strand, London, W.C.

EX CATHEDRA.

Manchester, in the month of April next, is to be the scene of an experiment in photographic exhibitions which deserves to be supported by both exhibiting photographers and the public. The latter are to have free admission to the Exhibition, which will consist of two sections: (1) Work sent in by photographic societies within fifty miles of Manchester; (2) Contributions by invitation. We wish the Manchester Amateur Photographic Society success in this undertaking. A liberal support of the Invitation Section will result in a collection of work which cannot fail to delight and instruct those who embrace the opportunity of studying it. There are some further details of the scheme in another part of the Journal.

Some of the railway companies have somewhat relaxed their restrictions with regard to the conveyance of cylinders of compressed gases; others have not, apparently—the North London to wit, as it still keeps up the following notice in red letters: "Notice is hereby given that cylinders containing compressed gases will not be accepted as passengers' luggage. Cylinders for conveyance by railway must be booked through the parcels or goods office at the stations. Particulars of the special conditions under which these cylinders are conveyed may be obtained at the office *at the time of booking*." The italics are ours. Some time ago a few of the railway companies published how it was necessary that cylinders conveyed by them should be packed and protected; but it appears from the above notice that the "special conditions" of the N.L.R. are only to be obtained at the time of booking. This reads a little absurd. How is one to know how to be prepared with the special conditions as to packing, &c., before the time the cylinder is tendered at the booking office, perhaps for it to be refused, as the unknown conditions are not fulfilled?

* * *

The Sunday Society has been in communication with the Trustees of the National Portrait Gallery, and recently it received a letter from the Trustees to the effect that the opening of the national museums and art galleries on Sunday afternoons has their unanimous sympathy and approval. The question, however, of extending the opening on Sunday afternoons throughout the whole of the year is one for the decision of the Lords Commissioners of Her Majesty's Treasury, and it is to them that the Sunday Society is now referred. A meeting of the Committee of the Society was held, at which the letter was read, and it was agreed to defer communicating with the Treasury until a reply from the Trustees of the National Gallery to a similar memorial had been received. Seeing how well the Sunday opening during the summer months has been appreciated by the people, it is to be hoped that the authorities will see their way to extend the privilege to all the year round. During the winter months it might be well to open the galleries earlier in the day, and close them correspondingly earlier in the afternoon.

* * *

In reference to our comments recently on the powers that be of the Salon altering the title of Mr. Eickemeyer's work in the recent show, a correspondent writes reminding us that this

is not the first time that the Linked Ring have done this kind of thing, and so brought a certain amount of ridicule on the unfortunate exhibitor; he quotes Mr. Lionel Bennett's work of last year as an example. Our correspondent suggests that, if the Salon has another exhibition, it should be distinctly stated beforehand that the General Committee reserves to itself the right of altering the titles of any works sent in according to their ideas, however absurd they may be; would-be exhibitors would then know beforehand what might happen, instead of unexpectedly finding, from the criticisms in the press, that their work has been made to appear ridiculous.

* * *

It is reported from Berlin that the Russian chemist, M. Czernik, has made a curious discovery of two minerals from the Caucasus. One of them is said to be a kind of coal, the ashes of which contain a considerable quantity of the newly discovered element, helium, together with other rare earths employed in the manufacture of incandescent mantles for gas burners. The other curious mineral is named cerite, and consists for the most part of the new element, argon. The most remarkable circumstance in connexion with these substances is that these two new elements have not hitherto been found in minerals in a pure state, but only in chemical combination with other elements. If the facts be as stated, it is an interesting chemical discovery.

* * *

The Bristol Town Council, it seems, has been of late in a state of some little agitation, consequent upon the gift, from one of its townsmen, of a portrait of Napoleon Bonaparte, which it was proposed should be placed upon the walls of the provincial Mansion House. The ex-Mayor protested that the Council Chamber was no fitting place for the picture, and that opinion was endorsed by several of the aldermen present. One of the councillors, however, said that, although he "did not care twopence for Napoleon one way or the other, "he presumed the picture was offered to them as a work of art, and Bristol was desirous of getting contributions towards an art gallery." After a good deal of discussion, the Council decided to accept the picture, leaving the question open as to where is to be the final resting place of the portrait of the departed hero. Patriotism is all very well in its way; but, when it is carried to the extent of refusing a work of art for a municipal art gallery simply because it happens to be the portrait of a vanquished foe, whose country has since fought side by side with us, it seems to be pushing matters a little too far. We wish Bristol well with its proposed Art Gallery, and, if the proffered work has sufficient merit as a painting, that it will have a place on its walls.

* * *

It often happens that for publication purposes it is required to write the title of the subject upon the negative itself so as to print upon each copy produced. This is easy enough for a practical engraver, but, for the photographer unpractised in the engraver's or the lithographer's art, it is not possible to write letters in the reverse direction, as is required if they are to print right upon the proofs. The following plan is given in *La Nature* for getting over the difficulty. Two solutions are prepared thus:—

No. 1.

Sugar	15 parts.
Glycerine	5 „
Water	60 „

No. 2.

Bichloride of mercury	5 parts.
Nitrate of mercury	10 „
Alcohol	60 „

Equal parts of each solution are taken and mixed together, and used as an ink on ordinary writing paper. This writing is then transferred to the gelatine surface by simple pressure of the paper by means of the fingers. Upon removing the paper, the writing will appear on the negative in the reverse direction, and, consequently, in the correct manner on the print.

* * *

It was proposed many years ago to construct an actinometer, founded on the behaviour of a mixture of chlorine and hydrogen when acted upon by light, but the apparatus never attained popularity, though it is well known that the strength of the light is directly measured by a given mixture. Recent experiments by MM. Gautier, Helier, and Berthelot show conclusively that, unless certain precautions are taken, the percentage of action by one and the same light (diffused daylight) may vary from 2·55 to 60 per cent., while, with the yellow sunlight of an autumn sun, the variation was from 6·7 to 92·5. These extreme figures were obtained, the one with dry and the other with moist air. The dry mixture was exposed to lamp light of 14·5 curcels power, and in about ten days 92·5 per cent. had combined; and, further, the rate of action was not uniform. Then, again, the rate of change was governed by the proportion of the constituent gases present. With excess of chlorine, thirty-one hours sufficed to obtain complete combination, 250 hours being needed when equal volumes of the gases were mixed.

* * *

Preparations for viewing the eclipse are growing apace, and the British Astronomical Association are to be congratulated upon the energy they are showing. Three official expeditions are being sent, and another, unofficial, will also start, twenty-six observers having come forward with promises to take part in the varied work necessary, the cost of which must be very considerable. Sea trips seem to be now recognised as the usual thing in connexion with eclipses, and the Orient Line's steamer *Orotava*, which is due to start from Colombo on June 20 next, will be so navigated as to sail along the line of central eclipse at the time of totality. Thus a trip to Ceylon and a return, starting from Colombo, can be pleasantly arranged for those interested in astronomy, and with leisure and gold to match.

* * *

Our readers have already been apprised that on Wednesday evening, December 1, at the Photographic Club, Anderton's Hotel, Fleet-street, E.C., Mr. James Packham, F.R.P.S., will deliver a lecture and demonstration of the *Bichromated-Gum Printing Process*. The lecture is held under the auspices of the Affiliation of Photographic Societies, and it will be seen from a letter in our Correspondence columns that visitors will be welcome to the meeting. Doubtless a large attendance will be the result, as the process appears to be exciting considerable interest. We understand that Mr. Packham has devoted a great deal of attention to this method of making prints, and will have several modifications and improvements to describe.

AN OVERLOOKED PROPERTY OF BICHROMATED GELATINE.

EVERY one who has been an observer of the progress of photography for the past two or three decades must have noticed how processes explained and principles enunciated in times gone by have become forgotten, and how some have been regenerated or reinvented and turned to useful, and, in many instances, profitable, account. Now, there is a property in connexion with bichromated gelatine that has not, up to the present time, received much attention; indeed, it is one that a great many people are quite unaware of, though many of the older workers of the carbon and analogous processes are perfectly familiar with it, as it was published and demonstrated nearly a quarter of a century ago.

Every one nowadays knows quite well that the action of light once started goes on in exposed carbon prints even though they are kept in perfect darkness; but it is not every one who is aware that this action can be transmitted to an unexposed film by simple contact, or that it is possible to obtain by this means non-reversed carbon prints from ordinary negatives by a single-transfer process.

Many years ago M. A. Marion read a paper before the Photographic Society of France, and also the Photographic Society of London (now the Royal), and showed results by two processes based upon this principle. He named them "Mariotype by pressure" and "Mariotype by contact." As these processes and the principle upon which they are founded seem at present to be quite unknown to the majority of modern workers, we shall recapitulate them, because they may be of interest to many, and possibly useful to some of our readers.

The first process—Mariotype by pressure—briefly, is this: A sheet of paper, coated with gelatine, is sensitised in a four per cent. solution of bichromate of potash, and dried. It is then printed, and, as the image is a visible one, its progress can be watched, as in the case of a silver print. When printed, the paper is put into another solution of bichromate of potash, this time, however, of only half the strength of the previous one. The print is then freed from excess of moisture and laid on the bed of a printing press having vertical pressure, as an Albion press, for example, or even a copying press, just as if it were a collotype plate, to which it is analogous. Instead, however, of a fatty ink being used, an alum-bichromate solution is applied. This is composed of alum and bichromate of potash, of each two parts and water 100 parts. The solution is applied with a sponge, and the excess removed with blotting-paper. A piece of ordinary carbon tissue is then placed on and the pressure applied for a minute or two. The tissue is then removed and the treatment of the *cliché* and the application of more tissue repeated until the required number of impressions is obtained. The impressions are then exposed to light for a few minutes, and afterwards mounted on single-transfer paper and developed in warm water, as in the ordinary carbon printing. It will here be seen that one exposure to light behind the negative suffices for a large number of prints, and it was mentioned at the time that the process was first brought forward that thirty and more impressions per hour could be produced, which could afterwards be developed in the ordinary way.

The other process — Mariotype by contact — is somewhat different, and more convenient to work when but one or two impressions only are required from each negative. It is this: Instead of the tissue being sensitised as in the usual way of carbon printing, it is the transfer paper that is sensitised and printed. As in the former process, the printed image is of a brownish-yellow colour, and it can be examined from time to time while printing the same as a silver print, so that one of the troubles to the novice in carbon printing—timing the exposure—is avoided. The sensitising of the transfer paper is done on a six per cent. solution of bichromate of potash to which a little sulphuric acid has been added. The paper is then dried and printed. After printing, a piece of carbon tissue, of the colour desired, is immersed in a two per cent. solution of bichromate of potash together with the printed transfer paper. The two surfaces are then brought into contact while in the solution, removed, and squeegeed together in the ordinary way.

After the exposed prints are mounted they are placed between sheets of blotting-paper, precisely as is usual in the carbon process; but, instead of being developed within a quarter of an hour or so, they must remain for some hours—eight or ten—say mounted in the evening and developed the next morning. While the prints are kept under these conditions the continuing action of the light goes on by transmission. The development is done in warm water, as in ordinary carbon printing, except that the water is employed somewhat warmer, from 110° to 130° Fahr. The results shown by M. Marion, by both processes, at the time he brought them forward, were pronounced very excellent.

It will be seen that in either of these processes two of the chief objections raised to the carbon process are met, the first being the difficulty of rightly timing the exposure. That is overcome because the image is a visible one, and can be watched while printing, the same as a silver print can be. The second is, that with ordinary single transfer a reversed negative is necessary. That is not the case here, as any ordinary negatives can be used, and the image is not reversed as regards right and left.

It may be asked why these two processes, with their accompanying advantages, have not come into general practice. The same question may be applied to several other processes; the principles upon which they are based were not taken advantage of till long after they were introduced.

Röntgen Rays on the Skin.—For some time past it has been quite evident that the exposure of the skin to Röntgen radiations has had a distinct and sometimes decidedly unpleasant effect on the skin, details of which have before been given by us. Dr. Foveaux de Courmelle of Paris has been investigating the subject, and as the result of experiments is able to describe a remedy. He finds that it is only the cathode, and not the Röntgen, rays which produce the unpleasant effect referred to, and he says that, if the whole of the Crookes' tube be wrapped up in a piece of black cloth during the sciographing, though the visible rays will be arrested, the Röntgen rays pass through unchecked, and, if any of the Röntgen rays do pass through the black cloth, little effect beyond desquamation is brought about.

Sharpness in the X-ray Photographs.—Seeing that, at best, Röntgen-ray pictures are only the representations of cast shadows, and shadows from a source by many degrees removed from a point, it is remarkable how clearly defined many of them are. Still there are cases when the extreme of sharpness is desirable, and means are sought for effecting this result. At the meeting of the Paris Academy of Sciences held on the 8th inst., M. Abel Buget read a paper on the spreading of the X rays, and, among other things, suggested a simple means of overcoming the difficulty—a method,

however, which though it does not appear to us to bear the impress of novelty, yet will doubtless be efficacious. It consists simply in the interposing of a leaden screen with a single small perforation between tube and object to be sciographed. It thus acts somewhat after the manner of a lens diaphragm, and enables much sharper results to be obtained.

To Photograph Faint Moving Celestial Objects.—Professor Barnard has recently published a very ingenious mode of overcoming the difficulty attendant upon photographing such objects as faintly visible comets which have a distinct motion of their own among the stars. As every one knows, any star observed through a stationary telescope quickly appears to move out of the field of view, and to obviate this effect a driving clock is attached to important instruments which moves the telescope exactly at the same rate as the earth rotates, so the star is automatically kept in view as long as is required. But this will not answer for a comet. Suppose it appears close to a given star when first observed, it will soon appear to wander away from the star and the clock movement is of little use. Professor Barnard fixes up an additional movement to work a light frame inside the eyepiece, to which frame two cross lines are attached. This movement, for which the works of an ordinary watch are quite sufficient, is so arranged as to correspond exactly with the motion of the comet. All that is then necessary is to centre a star in the immediate neighbourhood of the comet by means of the cross wires, and then, by the ordinary slow motion for star-guiding, keep the star image bisected by the cross lines while the plate is being exposed. The result will be to keep the comet image stationary on the plate.

The Yerkes Observatory.—The inaugural ceremony starting the official opening of the Observatory excited considerable interest in the astronomical world, as the institution contains the largest telescope and the best-equipped laboratory in the world. As it lies about 1200 feet above the sea level, every opportunity will be afforded of taking astronomical photos free from the difficulty of earth tremors and atmospherical disturbances caused by the proximity of towns. All the photographic arrangements are very complete and thorough. The huge front lens of the telescope is forty inches in diameter, and its two component glasses, together weighing nearly a quarter of a ton, are mounted in aluminium bearings in a cast-iron cell, which is about as heavy as the lens. The telescope itself is sixty-four feet long and weighs six tons. With so large a lens photographs of stars a tenth of a second apart should be able to be secured showing the stars just separated, and this theoretical efficiency has been actually proved, in practice, to exist.

At the same time it has to be remembered that, the larger the diameter of the lens, the thicker it must necessarily be, and Continental astronomers have calculated that the increase in thickness may be so great as by its subtraction of actinic light to entirely minimise any advantage gained by increase in diameter beyond a certain extent.

The Moon in the Big Telescope.—Mr. Barnard's first work on the Yerkes instrument, at least as published, has been on the moon. He is reported as saying: "One can see an enormous number of small details never seen before, such as small craters and minute crevasses, but there are no traces of water, air, or life, to be detected. It is possible that the lines found on the photographs taken at Meudon Observatory in France might be crevasses. I only know that the observations taken here fail to give any confirmation of the theories of the Parisian astronomers."

TRANSPARENCIES IN HALF-TONE PROCESS WORK.

I do not know whether the practice is ever adopted of utilising a transparency, instead of a paper photograph, in making half-tone negatives with the cross-line screen, but it is one that might be followed with advantage wherever the opportunity occurs. I am quite aware that in the great majority of cases the process worker is not at liberty to choose the originals from which he has to work, but has to take whatever comes in his way, be it silver, platinum, or carbon; still there must be many cases, especially of the better class, and important subjects, where it is possible to secure a transparency or, what is equally useful, the original negative, from which it is the work of a very few minutes to produce a transparency by the collodion process.

The advantages gained are, in the first place, much better gradation than can be secured from the majority of positive proofs on paper, and, what is perhaps often of equal importance during the time of year now approaching, a very great saving in the time of exposure. In the matter of gradation, it does not take long to impress upon any one taking up the work for the first time how few photographs, however good they may be themselves, are really suitable for copying purposes without a lot of dodging and manœuvring with stops of different sizes and shapes in order to satisfy the requirements of both lights and shadows. And, though it has been laid down that the best commercial negatives—*i.e.*, those that give the greatest satisfaction—are such as have dots everywhere, or, in other words, exhibit no masses of heavy shadow, it is palpable that, when such exist in the original, any dots that may appear in the reproduction can scarcely be in true gradation.

At the same time we know perfectly well that it is comparatively easy to secure this result from the heaviest of prints, especially those with a glossy surface, by suitably increasing the exposure, owing to the amount of light reflected from any surface, even if perfectly black; but, in thus utilising the reflected light from the shadows of a picture, there is little chance of discriminating between slight differences of shade, though they may be visible to the eye; the result is, as is too frequently seen in half-tone work, only a uniform tint entirely devoid of gradation; but, if the reproduction were made, not by reflected light from a paper positive, but by direct light passing through a transparency from the same negative, however deep the shadows might be, any gradation that might be present would have, at least, a better chance of correct rendering, since it would not be mixed up with any false illumination arising from reflection; the direct light, in fact, suffering filtration through the varying shades of the transparency, would reach the plate in precisely the same scale of gradation.

Then, there is another advantage on the side of the transparency. A very great difference in the result obtained can be produced by using a lighter or darker print, as the case may be, but with paper prints the limits between which this power can be exercised without resulting in flatness on one side or heaviness on the other are comparatively narrow. Not so in the case of a transparency, for, by judicious variations of exposure and development, almost any character of image and gradation can be obtained. Thus a vigorous and plucky transparency can be made from a negative that will give nothing but a flat or heavy print on paper, while excessive contrasts can be modified in the same way to produce a fairly harmonious result. Therefore, on the score of gradation alone, where it is possible, it may be often well worth while to go to the slight extra trouble of making a transparency from which to produce the half-tone negative.

But, in thus using the transparency, we not only gain the advantage in the way of gradation, but, by using direct instead of reflected light, we reap the inestimable additional benefit of greatly shortening the exposure. When it is considered that brilliancy of illumination goes much further in screen work than length of exposure in securing quality of result, the value of this feature may be estimated. Even if the reflected light from a well-illuminated white surface, acting through a transparency of moderate density, be used, the gain is noticeable as compared with working from a paper positive; but, when the direct light from a clear sky, or of sunshine, or one of the more powerful artificial forms of illumination acting through ground glass or other softening and diffusing medium is used, the difference in exposure is very great.

Where direct skylight is impracticable, as I dare say it is in very many town establishments, and artificial light has to be used as the only possible improvement upon the comparatively feeble light re-

flected from a white surface, a difficulty may be anticipated in evenly illuminating the transparency. But this difficulty need cause no trouble, for by interposing the transparency between the screen and the plate—in contact with the latter if a dry plate, or just separated from it by a paper mask if a wet one—precisely the same result is produced as if the transparency were copied from outside the camera. Of course, in the case of reproduction to a different scale, the transparency must be specially made to the new scale.

This is a method of using the screen that I do not remember to have seen mentioned in any of the "process" publications, at any rate recently, but I think I must have taken the idea from somewhere at some time, for it is the way in which I first began to experiment in screen work some years ago, only that I then used a negative. At any rate, it is, when a transparency is employed, not only as easy in practice as the usual method, but actually easier, and if the transparency be a suitable one, *i.e.*, not too dense, the result will be identical. Its application, however, is necessarily limited by the screen distance, for, where that is less than the thickness of the glass plate, it is clearly out of the question to get the transparency into position.

The screen distance, *i.e.*, the distance between the screen and the sensitive surfaces, not the transparency, will be precisely the same as in the ordinary way of working, and therefore precisely the same dot formed, the only difference being that, instead of the image formed by the lens being thrown upon the screen and by it broken up into dots, the dots formed by the screen fall upon the transparency in contact with the sensitive surface and print a reverse. The preliminary focussing arrangements are made by placing the transparency, image side upwards in the camera with the dulled side of a sheet of ground glass in contact with it, and then focussing the screen in the usual manner. If the screen distance is arrived at by calculation or from tables, then allowance will have to be made for the thickness of the transparency, but the method of focussing the actual dot is so easy, and at the same time so satisfactory, that it is much to be preferred.

If the extension of camera or size of stop render the screen distance too close to admit the transparency, the use of the multiple stop I recently recommended will be found a satisfactory way out of the difficulty.

With the arrangement described we are almost independent of lighting, especially with dry plates for, the lens may be turned right on to the source of light with a piece of ground glass interposed, and with daylight, electric light, or magnesium, the exposure is extremely short. With a slow gelatine plate, one of the "ordinary" grade, not a "process" plate, and an exposure of a quarter of an hour, I got, a few evenings since, a fairly exposed result using a duplex paraffin lamp placed at the side of the camera and a sheet of white paper as a reflector at an angle of 45° close to the lens' hood. This was exactly the same exposure I had given *by daylight* with the same plate, lens, and stop, but working from a paper positive in the ordinary way.

W. B. Bolton.

ON THE USE OF ACETONE INSTEAD OF ALKALI IN ALKALINE DEVELOPERS.

We have already shown that acetone in the presence of sodium sulphites can develop the latent image as well as the alkalies. We have now examined the phenomena, and proved that the developing power is not due to the sulphite nor to the acetone alone, but to the tendency which acetone has to give a bisulphite compound in the presence of a phenol compound which absorbs the alkali set free. This reaction may be expressed in the case of hydroquinone as follows:—

$$2\left(\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CO\right) + 2Na_2SO_3 + C_6H_4\!<\!\begin{matrix}OH\\OH\end{matrix} =$$

Acetone. Sodium sulphite. Hydroquinone.

$$= 2\,NaHSO_3 + 2\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CO + C_6H_4\!<\!\begin{matrix}ONa\\ONa\end{matrix}$$

Bisulphite compound. Alkaline phenate.

Pyrogallic acid was tested, a one per cent. solution being used, and the effect of varying the quantities of the sulphite and the acetone was tried.

Influence of the Sulphite.—Having prepared the one per cent. solution of pyrogallic acid with five per cent. acetone, the quantity of sulphite was increased from 2·5 per cent to saturation, and the tests showed that there was no advantage in increasing the proportion of sulphite above five per cent.

Influence of the Acetone.—A one per cent. solution of pyro with five per cent. of sulphite was used, and acetone was added from one to twenty per cent. Under these circumstances it was noted that the vigour of the negatives was very little with small quantities of acetone, increased gradually till ten per cent. of acetone was used. Beyond this strength the density decreased, and the colour of the silver varies from black to reddish-sepia in proportion to the quantity of acetone.

From numerous experiments the following is a normal developer:—

Sodium sulphite anhydrous	5 grammes.
Acetone	10 c. c.
Pyrogallic acid	1 gramme.
Water	100 c. c.

The negatives given by this are dense and full of gradation.

Modification of the Developer.—It has been found that with this developer over-exposure may be corrected by the gradual addition of acetone, as with carbonate of soda. An over-exposed plate should be placed in the pyro and sulphite, and the acetone added gradually till the image appears, and then the plate allowed to develop completely.

Concentrated Developer.—In practice, a solution of sulphite, twenty in 100, should be made, and four of pyrogallic acid added for use; twenty-five parts of this should be diluted with seventy-five parts of water, and ten parts of acetone added. The normal developer will keep in a stoppered bottle for five days without any change or loss of power, but, if exposed to the air, becomes oxidised the same as all alkaline pyro developers.

The Colour of the Image.—By increasing the quantity of acetone, and when from twenty-five to sixty degrees of acetone is used, the colour of the image varies from warm black to reddish sepia. With slow plates this change of colour is less noticeable, but the process may be useful for transparencies.

The advantages of the acetone developer are that there is absolutely no staining of the negative and no alteration in the colour of the image, the suppression of the usual inconveniences of the alkaline developers, the great power of modification, and, finally, the varying colour of the deposit with increasing quantities of acetone which may be useful for transparencies.

When para-amidophenol was used, the following was found to be the best normal developer:—

Sodium sulphite (anhydrous)	10 grammes.
Acetone	15 c. c.
Para-amidophenol	0·7 gramme.
Water	100 c. c.

This developer was found to be inferior to the para-amidophenol and caustic lithia, this being probably due to inferior solubility of the para-amidophenol in the acetone compared to the lithia, which is in the proportion of 0·7 to 2 0 per cent. This developer keeps well.

MM. Lumière Frères and Seyewitz.

FUZZYISM.

To attempt, without being an artist, and I certainly am not one, to decide the question between a "fuzzyite" and his opponent, may be beyond me, but I can deal with the question upon a few points of fact. The definition of Art, says Mr. James Cadett in *Dry Plates*, is a bold thing to make. It might be artfully described as the representation of the beautiful, whether in the abstract or the concrete, or both, though, in the ideal sense, it is supposed by some of the great to be beyond the possibility of any approach by that modest maiden, Photography. Many, however, think that art must partake sufficiently of the concrete to be within the limits of comprehension of the poor mortal. Some people whom we know strongly declare that a sharp picture cannot be artistic, while others, without going so far, say parts of a picture should be blurred, also others should be brought into greater prominence, and be sharp or well defined. Of course, we all know that the word "sharp" is somewhat on a par with the word "instantaneous," neither of their true meanings exist in the strict sense of the word, that is to say, an instantaneous picture is conspicuous by its absence; but we have acquired the habit, photographically speaking, of defining a sharp picture as one in which the point is to be taken as a circle of confusion not greater than the one-hundredth part of an inch; beyond that it gives to the normal eye a sensation somewhat of fuzzyness, or of the effect of being blurred. There is an argument, which those advocating diffusion of focus bring forward, and which I never could

understand, because to me their argument proves thom them to be hopelessly in the wrong from an abstract point of view. They say that, because the eye is not able to see sharply more than a very small portion of a subject, that when we represent any such subject by brush or pencil, it should be represented under the same conditions, *i.e.*, that only some point or other should show the effect of sharpness, the rest of the picture being in that delightful oblivion which is now receiving the name of "fuzzyness," and which is supposed to destroy useless detail and allow the eye to remain comfortably upon the chief point of interest in the picture. Now, the "fuzzyites" entirely forget that the same imperfect eye which looks on the subject also looks on the picture that the artist has produced. The consequence is that, when the eye is resting on the chief point of interest in the artist's picture, the other portions are receiving a second amount of blurring; first, because the vision at angles to its normal is no longer capable of much discernment; and, next, because, when the picture has had a certain amount of fuzzyness put into it, the eye is made worse as an optical instrument than before, from this *extra* blurring. This, of course, is leaving out of question the fact that the eye, though to please the artist, should be relatively kept upon the chief point of the picture or subject, and see little else, as an actual fact (in the same way as we view any subject) unceasingly wanders over that picture or subject in a most extraordinary and rapid manner, indeed so much have we trained ourselves in the examination of the various objects of life, that, without being conscious of it, the eye is darting its normal line of vision all over the place in order to embrace as much of the subject as possible.

Now, if I might be permitted to give a word of advice to the fuzzyite, I would say to him, Strive, in your best endeavours when photographing, to choose such subjects which contain as little as possible useless and inartistic detail. If ever photography is to be considered an art, that art can, and only does, rest upon the training of the eye to select such subjects as nature gives for the photographer; such art as this is not, to my mind, though I profess to be an old and experienced photographer, to be mentioned with the true art of the brush, in which we have an absolute choice of selection, and, provided that the artist be really an artist, he has complete selective control of his subject and the details attending it. Not so, however, with the photographer; no matter how beautiful the subject he represents, there always will be details which, from an artistic point of view, have no right to exist in the picture. This is where the trouble really lies, there is no occasion to deteriorate the powers of our lenses in giving sharp pictures if once it be remembered that, when the eye is looking on the chief point of interest, the rest, however sharply focussed and photographed, is very little seen of as regards detail. It is only when the eye travels about that it is able to embrace all it can see over the pictures sharply, and just in the same way as the eye is moving rapidly over the picture so it does over the most artistic subjects that nature produces (and there is no reason why one, as far as the eye is concerned, should have a different treatment to the other).

Now for a few words on the other side. I am bound to admit that some of the pictures at the Exhibitions of the Royal Photographic Society and the Salon which have pleased me most belong to the fuzzy class. Why? Let me say that on no consideration would I lose any detail in beautiful architectural subjects such as are so admirably photographed by many of the exhibitors in Pall Mall. Why? The reason is only too simple, the artist has already been there in design and sculpture, and is supposed to have left only that which the eye may contemplate with pleasure.

Now let us take a portrait by photography, untouched pure and simple, and as sharply as we can obtain. What have we? To my mind, a horror—flesh texture and colour luminosity absolutely false. Ananias not in it with that hard, coarse, angry-looking face. Why? The plate is incapable, absolutely, of any near approach to the representation of colour luminosities as seen by the eye in flesh texture. Something has to be done, two methods are open to us. Call in the artist retoucher (Heaven save the mark as regards the retoucher in general!) or blend the defective texture into an harmonious whole with the splendid Bergheim lens; neither method the truth (art does not pretend to be truthful) but infinitely preferable to the sharp photograph.

Let me take again landscape photography. Why is the fuzzy photograph so often more pleasing than the sharp one? Simply it is an attempt to destroy painfully unnecessary detail. Simplicity is, I believe, one of the canons of Art; I do not know, but am told so. At any rate, the result of the judicious blend of diffused focus is more pleasing than the bewildering unnecessary detail.

Scientifically, "fuzzyism" is an evil, but it may be the lesser of two evils. The subject should be perfect, and the plate and lens also perfect, but they are not and never can be. The subject can only approach perfection when the artist has already had to do with it, then let him focus as sharply as he can.

FUZZINESS *VERSUS* SHARPNESS.

This subject presents at the present time something in the nature of a *quæstio vexata*, and has been referred to more than once in the columns of The British Journal of Photography and in those of its contemporaries; in addition to which, it forms the subject matter of a special article by a writer, under the initials "J. C.," in *Dry Plates* for the current month. This article is a valuable contribution to the literature of the subject, chiefly, perhaps, because it is not dogmatic.

Now, pictures may be said to belong to one of two classes—*i.e.*, objects in nature, and objects which have been produced by the hand of man. "J. C." says that "the subject can only approach perfection when the artist has already had to do with it," which saying would seem to imply that the human artist is greater than that other Great Artist who made the world; but possibly "J. C." does not mean this. The little word "Art," so promiscuously used nowadays, is not very easy to define exactly, especially in view of some of the monstrosities which are dubbed "artistic" at the present time, and the dictionary does not much help in the matter. It says, in a note under art, "The liberal or polite arts are those in which the mind or imagination are most concerned, as poetry, music, and painting;" and I take it photography can hardly be said to come strictly under this heading, because the photographer has to take things, certainly in nature, pretty much as he finds them. The most he can do is to vary his standpoint in order to make his picture *compose* better; he cannot add to, or take away from, his subject (of course, I do not refer to *composite printing*, which is foreign to the title of this communication) as a painter can and does.

Of course, in the studio a different order of things prevails. Here it is possible to arrange the subject to be photographed, together with its surroundings and lighting, in almost any conceivable manner, and therefore taste, the artistic temperament, and imagination have ample scope, and a picture becomes more of a possibility, and it is, perhaps, in this sense, to which may be added sculpture, that "J. C." refers in the quotation from his paper to which I have made reference above.

Having arranged our picture, provided for us either by nature or by the hand of man, we next proceed to photograph it, and then arises the question which forms the title of this article, *i.e.*, shall we take it out of focus and so produce the "fuzzigraph," or shall we take it as sharp as our lens can do it? It seems pertinent at this point to ask why all the leading lens-makers, such as Dallmeyer, Ross, Wray, Taylor, Gœrz, Zeiss, &c., should all be vying with one another to produce lenses that shall cover the plate sharply to the edges, if, after having possessed ourselves of one of such lenses, we deliberately throw it out of focus; would not a spectacle lens, or stenopaic photography answer as well? Another question may be asked, too, If the public like "fuzzy" pictures, why, at lantern exhibitions, does one so often hear, as I have done, "Can you not sharpen up that picture a bit?" And why, too, are opera glasses included in a lanternist's kit, if not to see that the picture on the screen is sharp?

The fact seems to me to be that "fuzzyism" is, like so many more things, carried much too far, and hence becomes almost a fad; this was exemplified by the Salon Exhibition, just closed, to which I went with some friends, and the impression produced upon all of us was absolutely painful, by having to look at picture after picture in which *nothing* was sharp, and some so much off sharp that it was really difficult to tell what the objects were, and it was quite a relief to turn into the Eastman show, which, although a trade one, was very distinctly on a high level. I ask any one, whose eyesight is normal, whether it is within the bounds of possibility to look at any subject whatever, and not see some part at least sharp, and probably a great deal more than a "fuzzyist" would care to admit? Can we not see the markings of the bark on trees, which are oftentimes characteristic, and say at once, from that alone, that is an oak, an elm, a beech, or a birch? Can we not, too, see the leaves and flowers, and, in like manner, tell the name of the plant from them? and can we not also tell if a house is roofed with tiles, slates, or, say, Horsham flaked stones, or whether it is built of bricks, or stone? or, again, if a church steeple is slate, or partly wood and partly slate, or stone? Most undoubtedly we can, with our natural eyes, determine all these points, not one of which is discernible in a "fuzzygraph."

We take a photograph with *one* lens (unless it be a stereograph, which is beside the point), and we look at it with *two* lenses, *i.e.*, our eyes, and I cannot help thinking that "J. C." does the eyes somewhat of an injustice when he says they are inferior to photographic lenses. It is, of course, quite true that the angle of vision is small as compared to some lenses, but the extreme rapidity with which the eyes move so as to embrace a large area, and the farther off the object is, so is the area increased and the movement quickened, compensates for the narrowness of the visual angle; then, again, the eye unconsciously stops itself down to admit less light, and so, as in the case of a lens we stop down, increases the definition. It is also true that everybody possessing two eyes sees everything double; that is, each eye sees by itself, but the images coalesce and only one impression is conveyed to the brain, and that is of a stereoscopic character.

In conclusion, it would appear that fuzziness has a certain legitimate application, and is not to be wholly condemned. In the case of a portrait, or of any subject in which it is desired to particularly draw attention to any one part of it, or in certain views having a great distance, or if the atmosphere is wished to be emphasised, in these cases an out-of-focus effect is permissible in all but the primary object, with intent to prevent the eyes wandering about the picture, which they naturally would do; but, seeking rest and finding none, they also naturally return to the spot where they can find rest; but, in the case of a fuzzygraph, what are the poor eyes to do? No rest anywhere, so they wander away to

another picture which provides for their wants. I imagine no one would represent architectural or geological subjects otherwise than in detail. Why, then, should some of the most lovely scenes in nature, constructed by the Architect of the Universe, be presented to us in a fashion with which we are quite unfamiliar? It would be as reasonable to expect any one to recognise, say, a Beethoven's sonata played upon a piano every note of which was out of tune! J. H. Baldock.

COMBINATION LIGHTING.

I.

With the approach of winter, and consequently uncertain, waning light, it follows as a natural consequence that in many branches of photography very different exposures have to be accorded a sensitive plate at this season of the year to what was requisite only a month or two ago. In regard to inside studio working, the difficulty of arriving at a proper estimate of the correct exposure to give is not nearly so great as is the case with an operator who is called upon to work in unknown and outside situations, such as dark warehouses or even badly lighted foregrounds in open-air subjects, for in studio work an operator has the opportunity of feeling his way from day to day, and hour to hour, under a fairly regular set of conditions that are entirely absent when away-from-home subjects are being dealt with; and more particularly is this the case when such subjects as very dimly lighted interiors are being photographed, and which require exposures ranging up to days to impress the sensitive plate sufficiently. It is in cases of the latter kind that an operator's patience and skill are tried to a very considerable extent.

In very dark interiors, or with such subjects when only a corner or small part of the same are desired, it is preferable to discard using daylight entirely, and to fall back upon a good method of artificial lighting, or a combination of daylight with artificial light.

Quite recently it has fallen to my lot to execute a series of photographs of architectural subjects in such dark situations as prevent the employment of daylight for the purpose, and, were it not for the use of artificial light, such subjects never could be photographed, for, in point of fact, many of them have hitherto been deemed beyond the skill of photography.

In writing thus I am far from wishing it to be understood that I decry the utilisation of daylight. On the contrary, no one knows the benefit of daylight more than I do, and any one that would discard operating when possible during the day for a system of night work by artificial light would, in my opinion, be doing a very foolish thing. Nevertheless, with the great facilities that magnesium powder and acetylene gas, as well as a powerful paraffin lamp, place in the hands of an operator, there is no doubt that almost any nook or dark corner is revealed upon the sensitive plate, and this with the expenditure of very little trouble after a fair amount of experience in this particular class of work.

In such situations as are only partially lighted by daylight, but which are too feebly lighted to impress a sensitive plate with sufficient vigour in some of the darkest portions of the object, thereby not permitting the bringing into view, it may be, of some very fine detail hidden away in the dark recesses, the employment of one or other of the factors I have named will work wonders in producing excellent results when used in combination with as much daylight as possible.

In nearly all cases there is room for the exercise of considerable judgment as to which of the methods of artificial lighting it is best to employ as an aid to daylight.

That much may be done with a good flash lamp and magnesium powder, I know quite well, but not with many of the toy articles that are now placed upon the market. Such may be of use for lighting up a very small space at close quarters, but for the more serious commercial class of work of which I am speaking, and which necessitates the illumination of a considerable extent of subject, such are of no practical value. A system of flashlight photography that calculates so many grains of powder as sufficient for all classes of subjects is not, to my mind, the *beau idéal* of a good system of working. When I say that with the original apparatus I can get up to close on five thousand-candle power illumination, some idea of this magnificent light may be formed. Such a light, however, is not obtained by burning a few grains or pinches of powder by a system of squirting a toy. In flashlight working, if it is desired to get a powerful light, then powder must be burned. It is no use scrimping it, and it may surprise some of my readers to learn that at times I consume as much as half an ounce of powder for one flash.

The great drawback of this method of artificial lighting is the dense smoke that is given off. In some situations it does not matter, but in other cases this is a fatal objection to its use. If, however, it be decided to employ magnesium powder, then a considerable amount of practice is necessary to so use the light as to obviate the introduction of too heavy shadows into the picture. Flashlight working is not picked up in a day, as many suppose, it takes a long time of continuous practice to properly work magnesium powder. Hardly two subjects will be found alike, and the results obtained by treating any two subjects in exactly the same manner will show very different results. In some subjects the chief aim is to introduce relief shadows; in others, the contrary. The chief aim is to avoid throwing almost any shadow at all. That much may be done to bring about either of these results is well known, but this is not secured by any happy-go-lucky method of blazing away at all positives. In this all will depend upon the disposition of the light in relation to the form of the subject. The less shadow desired as a rule requires the light being employed from a point almost immediately behind the lens. It is really marvellous what even an inch of difference in the position of a lamp will show in respect to the shadows and consequent rotundity of the picture. As I have said, nothing but practice can teach this, and very few indeed of those who have this experience will be found capable of producing the very best results at the first attempt. How often does it happen that it is deemed that the lamp has been just three inches too far to the right or left, and, on this being rectified by a duplicate exposure, very much better results are obtained.

The utilising of the lamp upon one and the same subject from different standpoints may be effectively practised; but some ludicrous results are often obtained by this system of lighting. In my opinion the best results are obtained by the employment of one flash only, but this may be effectively produced by more than one light at the same moment of time.

Of the various methods of burning magnesium powder I need not offer any suggestions, beyond saying that the method that consumes the most powder with the least waste is, no doubt, the best; but it is false economy to study the value of every grain of powder. In my practice I use a home-made article, consisting of a long tray, into which I place a strip of felt saturated with methylated spirit. These trays are interchangeable in my lamp; some of them are twelve inches long, and it may be readily imagined the light such trays yield when up to half an ounce of powder is sprayed into the twelve-inch flame. T. N. Armstrong.

PROFESSOR MILNE AT THE CAMERA CLUB.

"What a comfort it is to listen to a lecturer who has some sense of humour in his composition!" Such was the thought of many members of the Camera Club, on Thursday evening last week, at the conclusion of a discourse from Professor Milne, which, although dealing with a serious topic, brimmed over with happy conceits. For your club member, be it a camera club or a goose club, cares not to take his science sadly, however he may take his pleasures; and, if ever there was a speaker who had the gift of chasing sadness away, Professor Milne may lay claim to the distinction.

Seismograms and Telegrams was his text, and we had much of the first and little of the second; indeed, telegrams were dismissed as hardly worthy of credence compared with the truthful story told by the seismogram—and that was all we heard about them.

But what on earth is a seismogram? will ask the man in the street, and what can it possibly have to do with photography? will ask many others. "One at a time, gentlemen, if you please," as the parrot said when the other birds pecked at its back hair. Both questions are pertinent, and shall be answered.

A seismogram is the record made by an instrument called a seismograph, just as a telegram is a record made by a telegraph, or a photogram—but no, we cannot carry the matter further; and, as this record is made on a strip of bromide paper by the action of light, we see at once the connexion between seismology and photography, and why Professor Milne was invited to address the Camera Club for the second time on a subject so dear to his heart.

All roads, in his opinion, do not "lead to Rome," but to earthquakes, and he confesses that he cannot converse with any one for half an hour without the talk drifting in that direction. He has caught the epidemic from the Japanese, among whom he lived for many years, and where earthquakes are so common that, when two friends meet, they ignore the weather, but compare notes of the "fine earthquake last night."

Earthquakes, Professor Milne tells us, are most intimately connected with all kinds of diverse things, and he undertook, among other matters, to trace their connexion with matrimony, and the amount of alcohol consumed at a certain club at Tokio.

With regard to the influence of earthquakes on the marriage market, he said: "Now, suppose you land in Japan. You arrive at an hotel, where you find every comfort, and you see around you a number of globe trotters, like yourself, from every country under heaven. They are mostly wealthy persons—globe trotters generally are—here a millionaire New Yorker with his wife and daughters, here a German baron with his daughters, and here, perhaps, an Englishman with a similar retinue. You would like to know more of these people, to become more intimately acquainted with them. You go to bed, and fancy that you are still on the ocean wave, and that the vessel in which you are is rolling to an outrageous extent. Then you wake, and, as bits of the ceiling fall upon you, you scramble to your feet, and suddenly realise that you are enjoying an earthquake. Out of the door you rush, and you find in the corridor people as frightened as yourself, and in similar undress uniform. You go for the millionaires, and for their daughters, and perform prodigies of valour, and are ever afterwards regarded as a hero, and —if matrimony doesn't result from all that, it's your own fault."

In the same happy vein, the Professor proceeded to show that earthquakes were directly responsible for the consumption of alcohol in that

club at Tokio. You may e there enjoying a game of billiards, when suddenly the balls begin to gyrate on the table, the lamps swing, the cues hanging in their tin cases on the walls are turned into pendulums, and there is a general stampede outside. Nerves as well as walls are shaken, for this is an earthquake, and no one knows what will happen next. Presently all is quiet once more, and the visitors gradually resume their calm and return to their quarters. But, before they can once more settle down into a contented frame of mind, immense quantities of stimulants are disposed of. Thus Professor Milne satisfactorily disposed of his second proposition.

The audience being in this way put into good humour, the Professor attacked his subject in more serious mood, and proceeded to describe, with the help of lantern slides, the various forms of instruments which have been contrived since a very early date for the purpose of detecting or recording earthquake disturbances. The latest, which is the outcome of careful experiment, is naturally the best, and with it Professor Milne has recently made some extraordinary observations at his home near Newport, in the Isle of Wight. It may be thought that observations are useless here, when earthquakes are as rare as the dodo. But this instrument is so sensitive that it will record an earthquake which takes place at the Antipodes, and the record is made so soon after the occurrence that all other means of communication are outstripped. As a case in point, the late severe earthquake at Assam was registered in the Isle of Wight long before the news of its occurrence was sent to this country by telegraph; and, although Professor Milne could not positively state the country where the centre of disturbance was situated, he was able to guess, from the form of the record, that it was at a distance from England equal to that of India. He has subsequently noted earthquakes which occurred somewhere, he believes in the neighbourhood of Borneo, on September 20 and 21, and on October 15 and 20. At present no other news of these occurrences has come to hand, and it will be most interesting to see whether Professor Milne's observations will, or will not, be corroborated.

The seismograph employed by Professor Milne is most simple in construction. Imagine a vertical rod about two feet high, placed on a carefully levelled stand, fixed on a pier of masonry. To this rod, at its lower part, is loosely attached, by a cup-and-pin joint, a slightly longer and horizontal one; this is secured in position by a stay to the top of the vertical rod, but is free to move laterally in either direction like the boom on a ship's mast. The movable rod carries at its free end a small metal plate pierced with a slit, and a similar slit appears on the top of a box just below it, beneath which latter a ribbon of bromide paper moves along by clockwork at the rate of one millimetre per minute. Near the slit is a watch, the hour hand of which is prolonged and carries at its end a little shield which covers the slit every hour. A lamp above shines through both the movable and fixed orifice, causing a thin line to be printed in the centre of the bromide ribbon as it travels along. When, however, an earthquake wave approaches, the horizontal rod is agitated in both directions, and the spot of light on the bromide paper synchronises with the movement. The line is no longer continuous, but becomes as forked and sinuous as the penmanship of a child first trying to write, or the signature of Guy Fawkes after he had been tortured.

It will have been noticed that the action of the watch in covering the slit every hour is to make a blank space on the bromide paper at regular intervals of sixty milimetres. In this way it is easy to mark the exact time at which a record is made, and, by knowing the rate at which the wave travels, the actual time at which the disturbance occurred can be readily calculated.

Professor Milne separates earthquake phenomena entirely from volcanoes, and in this respect he differs most materially from old theories. Of course, a violent volcano eruption, or explosion, will shake the surrounding country—and the strong air blasts which often result from such an explosion will tear down houses and do much damage in their path. But the majority of earthquakes are caused by landslips due to gradual upheavals of the earth, and rocks settling down into new positions.

About 75 per cent. of the earthquakes which occur find their origin beneath the sea, and they are most common when the slope of the land towards and beneath the sea is very abrupt and steep. These violent dislocations of submarine land cause constant changes of level, and will often have the effect of snapping telegraphic cables lying on the ocean floor within their reach. Ten years ago, on the northern coast of Australia, three submarine cables suddenly became silent, and much alarm was felt in consequence. Rumours of war became prevalent, and measures were taken by the colonists to cope with any attacking force whose approach might thus have been heralded. But it was a false alarm. What had really happened was a submarine earthquake, which had torn apart the cables—an accident which would at once have been relegated to its true cause had a seismographic station been established anywhere near at hand.

The pictures which were thrown on the screen in illustration of this most interesting paper were very remarkable, some of them quite terrible the story they told. In one we could see how a railway embankment had been destroyed, leaving the rails self-supported in the air with the sleepers hanging to them; in another a cotton factory had completely collapsed, killing 300 inmates—an object-lesson which plainly showed the almost criminal folly of adopting European methods of building construction in earthquake districts. But the most terrible of all were the photographs showing the desolation caused by the big ocean wave which hurled itself, only a few months ago, on the shores of Japan and drowned 30,000 men, women, and children. Houses were swept away by the hundred, and the beach was strewn with the corpses of the sufferers. Photographs like these could only be shown to such a semi-private audience as that which the Camera Club presents.

Professor Milne urges the necessity of establishing seismographic stations at various points of our broad empire, which covers so many districts where earthquakes are more or less common. He points to the example shown by Japan, where no fewer than 960 such stations have been instituted. The Japanese, indeed, make a study of the phenomena so common to their country, and now build in such a manner as to neutralise as far as possible the effect of earth convulsions. When the recent earthquake occurred at Assam, they immediately sent a Special Commissioner to report upon the matter, and at all their colleges earthquakes and the best means of minimising their effects by modified methods of building construction form part of the curriculum. It is time that the English colonies should do something in the same direction, even on the score of economy, for the damage wrought to Government property during the Assam earthquakes can only be remedied by the expenditure of a quarter of a million sterling. Much of this could have been saved if our Indian authorities had known as much earthquake lore as do the far-seeing inhabitants of Japan.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Once more we have received our accustomed notice of the waning of the year in the Hackney Photographic Society's Eighth Annual Exhibition, which was held at the Morley Hall, Hackney, N.E., on the 16th, 17th, and 18th inst.

The Hackney Society always does well whatever it undertakes, and its Exhibitions have been so well organized that they have earned the right to be looked upon as among the important fixtures of the year. The present Exhibition proves amply that the Society is not likely to lose its reputation for energy and enterprise, and we sincerely congratulate the members who shared the immense amount of labour that the carrying out of such an Exhibition entails upon the successful result they have achieved.

It seems to have been a feature in this year's London exhibitions that something of a surprise was provided for the visitors in the shape of new methods of decoration. Thus the walls of the Royal Photographic Society's Exhibition at Pall Mall were disclosed on the opening night in all the glories of drapery, and the Photographic Salon, with more boldness, attempted to demonstrate that the colour and character of the wall upon which photographs are hung are of supreme importance, and their attempt was successful in a direction and to an extent that probably surprised none more than our would-be dictators. The Hackney Society have not followed the fashion in adopting any unusual scheme of decoration. The surprise they provided for their friends and patrons was in an entire rearrangement of the ground plan of the Exhibition. In previous exhibitions the panels upon which the pictures were hung were arranged against the side walls of the gallery, and the trade exhibits occupied its centre. This year the gallery has been divided lengthways into three spaces by erecting partitions about eight feet high, upon both sides of which the pictures are hung. Possibly the present arrangement somewhat detracts from the general appearance of the room; but on the other hand, it provides a considerably increased area of wall space, and has the further advantage that those viewing the pictures are not so liable to jostle or be jostled by their neighbours as in the old arrangement.

Unfortunately the gallery is not an ideal one for the purpose in its illumination either by day or by night, and this is a matter practically beyond the control of the Society without considerable expenditure; but as the balance of advantages seems to be with the new arrangement of screen, and it is therefore likely to be followed in the future, some of the engineering experts of the Society may devise a means of overcoming the difficulty without incurring a prohibitive cost.

As regards the pictures, there is no doubt that the quality of the work both in the members' and the open classes, is an improvement upon that of the last Exhibition, and this in spite of the fact that the number of exhibits is about one hundred in advance, the last number in the catalogue being 453, and among these the pictures sent "not for competition," lantern slides and stereoscopic slides, are not included. We cannot however, regard the display of so large a number as a desirable feature of the Exhibition. That 252 pictures, the work of members, can be collected is undoubtedly a testimony to the members' industry and enthusiasm, and that over 200 have been attracted from outside is a testimony to the popularity of the Society, and to the esteem in which its Exhibition is held by photographers generally. But we think the principal object of this and other like Exhibitions would be more truly served by the exercise of a prudent amount of restraint in accepting works tendered for exhibition. To be awarded a place on the walls of such an Exhibition as the Hackney should be in itself a certificate that a work possesses some admirable quality, and, if the educational mission of the Exhibition, both to the members themselves and to the outside

ublic who visit it, is to be considered, it is a matter of importance that ome method of selection should be adopted. We do not wish it to be nderstood that we consider the average of the work shown a low ne; indeed, it is extremely creditable to the Society, but we must say hat many of the frames could well be spared, and some ought to have een unhesitatingly rejected. In justice to those who are responsible to he Society, and indirectly to the public, for the arrangement of the ictures, so that each may be viewed with some degree of comfort, they hould not be set to perform an impossible task.

The Judges were Messrs. F. A. Bridge, F.R.P.S., J. A. Sinclair, F.R.P.S., nd E. J. Wall, F.R.P.S.

To Mr. J. Carpenter the gold medal is awarded for the best picture in he members' classes. His charming little picture, *Sunshine and Shade*, von many admirers at the recent Exhibition at Pall Mall, and was ionoured by a full-page reproduction in the catalogue. Though but an ordinary bit of woodland scenery, it is characterised by a quality which s rarely seen in photographs, and to which it owes its success. It epresents sunshine without being chalky in the sunlit portions and lack in the shadows. Mr. Carpenter's other work is all admirable. His lower studies, marked "not for competition," have by their excellence endered impossible the award of the special medal offered by himself for he best still-life subject in the members' classes, and the Judges have withheld the award.

In Class A, for pictures taken since last Exhibition, Mr. W. A. Hensler gains the silver medal for a pinhole photograph, entitled *So Softly Fades the Waning*. In Class B, for pictures taken during membership, he is also awarded the silver medal for *The Deserted Grange*. Mr. Hensler's work is all good—we might almost say monotonously good. In his twenty contributions to the show there is not one that does not please us; but, at the same time, we think he does an injustice to himself by adopting one almost unvarying style of treatment. Mr. F. E. Roofe's bronze-medal picture in Class A, *Declining Day*, is a very meritorious work, and far in advance of his other exhibits in pictorial quality. Mr. J. J. Westcott, who gains a certificate in Class A, is also awarded a silver medal presented by Mr. J. O. Grant for the best animal study, the bronze medal for hand-camera work, and the silver medal for lantern slides. His work throughout is admirable, and it is noteworthy for the versatility he displays. A special silver medal, presented by Mr. L. S. Wilks, for the best architectural photograph in the members' classes, is awarded to Mr. W. Rawlings, and he also wins the bronze medal in Class B for an architectural picture. Both pictures are interiors of Ely Cathedral, and are good. His landscape work is also very commendable.

The hand-camera class, Class C, is not a particularly strong one, and the Judges awarded two bronze medals instead of a silver and a bronze. Mr. W. Selfe receives one of these for a study of a sea eagle taken at the Zoological Gardens. Mr. Selfe is a large contributor to this and other classes. His work is always neat and careful, and often not without pictorial merit. The other bronze medal is won by Mr. J. J. Westcott for a capital little picture, entitled *Washing Day, Norway*, and he also gains the special silver medal for the best animal study, the subject being the same sea eagle just mentioned.

In addition to those who have been fortunate enough to gain the prizes we must not omit to mention the work of Messrs. C. T. Humphrey, A. S. Stathan, W. L. Barker, S. H. Hill, F. W. Gosling, J. E. Hull, W. Fenton-Jones, J. O. Grant, E. J. Hunt, A. Dean, and Dr. Roland Smith.

The members' Lantern-slide Class is a large one, and very creditable with regard to quality. Altogether there were twenty-one sets of four slides entered.

This year the open classes show a striking improvement in quality, and there is a marked increase in the average size of the pictures sent, small pictures being quite the exception. The Champion Class is especially good for a champion class, where, as a rule, some of the worst work in the Exhibition is to be found. The gold and silver medals to Messrs. J. H. Gear and F. Marsh for *The Receding Tide* and *Gas Works—Charging Retorts*, repeating these gentlemen's successes at the Pall Mall Show; the other silver medal going also to a work from these by Mr. John Stuart, *St. Leonard's Hospital, York*. The Portraiture Class is a most interesting one, and Mr. P. McDonald well deserves his silver medal for *A Study of a Head*. *Merry Tommy*, by John Stuart, a capital portrait of a little boy, receives a bronze medal, and a second bronze medal is awarded to Mr. Thomas Fall for a portrait of a child.

The open class, for pictures not having previously received an award, is the largest in the Exhibition, and contains close upon 150 frames. Mr. J. Bulbeck adds another to his many honours for architectural work, and Mr. P. S. Lankaster is deservedly recognised for a fine and effective landscape piece, entitled *The Afterglow*.

The trade exhibitors made quite as good a show as usual. The most interesting exhibits are by Messrs. E. G. Platt. Lonsdale Bros., The Prestwich Manufacturing Company, H. Park, E. Matthew, R. & J. Beck, J. H. Dallmeyer (Ltd.), R. Beckett, of The Terrace, Hackney, and W. Sherman, of Mare-street, Hackney.

The Judges awarded silver medals to Messrs. J. H. Dallmeyer for the Stigmatic lens, and to the Prestwich Manufacturing Company for apparatus for animated photography.

In addition to the ordinary attractions of the Exhibition, there were demonstrations of animated photographs by Mr. S. J. Beckett, and of the X rays by Dr. Gerard Smith, in the smaller halls, and each evening a capital programme of vocal and instrumental music was provided under the direction of the President, Major Woolmer Williams, and Messrs. W. A. J. Hensler and W. L. Barker.

The Awards.—Members' Classes.

Class A. (For pictures taken since the last Exhibition).—Silver medal, W. A. J. Hensler; bronze medal, F. E. Roofe; certificate, J. J. Westcott.

Class B. (For pictures taken during membership).—Silver medal, W. A. J. Hensler; bronze medal, W. Rawlings.

Class C. (Hand-camera work).—Silver medal, withheld; bronze medals, W. Selfe and J. J. Westcott.

Class D. (Lantern slides in sets of four).—Silver medal, J. J. Westcott; bronze medal, W. Fenton-Jones; certificate, A. W. Cook.

The gold medal for the best picture in Members' Classes, J. Carpenter.

Special silver medal, presented by Mr. J. O. Grant for best animal study, J. J. Westcott.

Special silver medal, presented by Mr. L. S. Wilks for best architectural photograph.—W. Rawlings.

Special silver medal, presented by Mr. J. Carpenter for the best still-life subject, withheld.

Open Classes.

Class E. (For pictures not having previously received an award).—Silver medal, J. Bulbeck; bronze medal, P. S. Lankester.

Class F. (Portraiture and *Genre*).—Silver medal, P. Macdonald; bronze medals, Thomas Fall and John Stuart.

Class G. (Champion Class).—Gold medals, J. H. Gear; silver medals, F. Marsh and John Stuart.

Class H. (Lantern Slides).—R. B. Lodge; bronze medal, Howard Esler; certificate, W. A. Fraser.

Class L. (Lantern Slides. Champion Class).—Silver medal, W. Archibald; bronze medal, F. E. Roofe.

Class J. (Stereoscopic slides).—Silver medal, T. H. Redwood; bronze medal, A. D. Fort; certificate, L. S. Welks.

Trade Exhibits.

Silver medals, J. H. Dallmeyer (Ltd.) and E. P. Prestwich.

THE NORTH-WESTERN PHOTOGRAPHIC EXHIBITION, APRIL, 1898.

A Joint Photographic Exhibition under this title is to be held in the City Art Gallery, Manchester, where four fine rooms have been secured for April, 1898.

There are to be no classes, no awards, no entry fee, no charge for wall space, and, above all, free admission to the public from 10 a.m. to 5 p.m. daily; a small charge will be made each evening to view the pictures and hear the lectures. The Exhibition is to be divided into two sections:—

(*a*) An open section in which all work passing the Selection Committee will be hung; this section to be devoted to the work of societies within fifty miles of Manchester. The Selection Committee of the section to be composed of capable Judges from several of the above societies.

(*b*) To consist of work by prominent photographers, and pictures from the principal London and provincial Exhibitions, by invitation.

An illustrated catalogue will be prepared for sale.

All societies within fifty miles' radius have been invited to join in the scheme, and to elect a representative on the executive; this should be done so that, in the event of his not being able to be present, he can be kept posted as to the doings of the executive.

The promoters (Manchester Amateur Society) have formed a guarantee fund to guard against any possible loss, and thus it will be seen they will take any risk of the undertaking. A meeting of the Executive Committee is called for Wednesday evening, December 8, to be held in the Magazine-room at the Manchester Athenæum, Princess-street, to arrange many important details. If there are any societies who have not yet decided to join in the scheme, they can not do better than do so at once, and send a representative to the meeting. The secretary is Mr. F. W. Parrot, Ashfield-road, Altrincham, and Mr. S. L. Coulthurst, 78, Collyhurst-street, Manchester, is acting as Honorary Organizing Secretary.

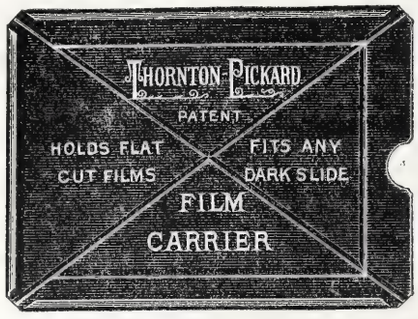
Our Editorial Table.

The Thornton-Pickard Film-carrier.

The Thornton-Pickard Manufacturing Company, Altrincham.

We have received samples of this new film-carrier, the chief points of which are extreme lightness, great rigidity and stiffness, obtained by means of indented ribs, total abolition of stiffening backings of wood, thick card, or other materials. The carriers fit any make of slide or plate-holder that an ordinary glass plate will fit. The half-plate size costs 6*d.* each, or 2*s.* 6*d.* per box of six. The carriers are

made of thin, blacked sheet metal, and the indented ribs run transversely. The edges are turned down to allow of cut films being



used, and the carrier, which is exceedingly thin and light, fits in the dark slide very easily. It is one of the best and handiest film-carriers that we have seen.

Messrs. Marion & Co., of Soho-square, have sent us samples of their Double Opaque Envelopes, which are made from pure linen air-dried needle paper. The paper is quite opaque, and, being chemically pure, is safe to use in contact with sensitive films. The envelopes, in addition to forming a good means of securing plates, films, &c., from the action of light, both before use and after exposure, will be found to be the best form of envelope in which to store the finished negatives, as any data may be written on the outer envelope by means of a white crayon pencil, or in white ink, or they may be labelled. The envelopes also answer in use for radiography.

The Autotype Company, 74, New Oxford-street, W., send us a copy of a booklet, *A Few Plain Words on Carbon or Pigment-printing*, by Mr. Valentine Blanchard, which is what it professes to be, namely, a short and simply written outline of the process for the use of beginners. The Autotype Company remark: "It occurred to us lately that a popular description of the process would be welcome to many not acquainted with photographic technicalities, and, in writing this little work, Mr. Blanchard has endeavoured to explain the principles of the Autotype process in language intelligible to the average lay mind." The Company send copies free to any applicant furnishing name and address.

Catalogues Received.

Hockett & White, Potter's-road, Barnet, N.

Messrs. Hockett & White are printers in silver and platinum, and enlargers in bromide, carbon, and platinotype; and this list details the many kinds of work they undertake, which includes all that appertains to trade printing. Prices are also given, as well as directions to those sending orders for execution.

Babajee Sakharam & Co., Esuf-buildings, Bombay.

An Indian photographic catalogue is something of a novelty to us, and in sending this one Messrs. Babajee Sakharam & Co. remark that it looks strange they should request us to notice such a production. Their excuse, however, is that, as before long people will be going out to India, the attention drawn to this catalogue may be serviceable to them. About 200 pages of the catalogue are devoted to photographic requisites, and the book compares in fulness of detail with very many home productions. Photographers visiting India should find it extremely useful for reference.

Messrs. George Houghton & Son, of 89, High Holborn, have sent us their price-list of second-hand and job stock. A copy will be sent post free to those asking for it. Cameras, hand and stand, dark slides, camera and tripod cases, tripods, lenses, shutters, dry plates, films, &c., burnishers, retouching desks, enlarging and magic lanterns, printing frames, plate boxes, dishes, and opalines are among the photographic apparatus, &c., which figures in the list.

News and Notes.

Erratum.—Line 35, page 739, in our article, *Judging the Exposure of Positive Proofs*, for "groups" read "proofs."

The North Middlesex Photographic Society's Exhibition will be held at Jubilee House, Hornsey-road, N., on November 29, 30, and December 1.

Photographic Club.—Wednesday evening, December 1, at eight o'cloc Mr. J. Packham will give a demonstration of the gum-bichromate process.

The Austin-Edwards Monthly Film-negative Competition.—The Pri Camera for the current month has been awarded to Mrs. J. A. Young, t Spa Hotel, Tunbridge Wells, for her negative, *An Autumn Day*.

In succession to the late Mr. F. W. Edwards, Mr. Charles H. Oakden h been chosen President of the South London Photographic Society. F several years Mr. Oakden worked hard as the Society's Secretary, and v sincerely congratulate him on his elevation to the Presidency.

Royal Institution.—Professor Oliver Lodge, F.R.S., will deliver the fir of a course of six Christmas lectures (specially adapted to young people) o *The Principles of the Electric Telegraph*, at the Royal Institution December 28. The remaining lectures will be given on December 30 a January 1, 4, 6, 8, 1898.

Professor J. A. Brashear has just completed the second photo-chron graph, which he has made for the American Government, for testing t velocity of cannon balls. The new apparatus has many improvements ov the old one, and has met all the expectations of the Government exper But one lever is used to fire the gun, start the tuning fork to vibrate, open t main shutter, and release the electric connexions which throw a beam of lig on the photographic plate, which rotates 1500 revolutions per minute.

The number of applications for patents filed in the United States Pate Office last year was larger than in any preceding twelve months. The increa is still continuing, the applications filed in the first six months of this ye exceeding the corresponding number filed in the first half of 1896 by upwar of seven per cent. The number of applications filed in the first half of th year was 25,559, and the patents granted were about six per cent. in excess those granted in the first half of 1896. During the fiscal year ending June 3 1897, the net revenue of the United States Patent Office was 317,135 dolla increasing the surplus in hand at the close of June, 1897, to 5,093,614 dolla

The *Falmouth Packet* records the death of Miss A. M. Fox, of Penjerric after a very short illness, at the age of eighty-one. She was the eldest daugh of the late Mr. R. W. Fox, F.R.S., and sister of Miss Caroline Fox, who published journal and letters of their earlier history created a large amount interest. For several years she was intimately associated with many ins tutions, charities, and scientific societies of Cornwall. She originated t idea of the Royal Cornwall Polytechnic Society, a photographic section which has for many years been a feature, and was the last survivor of tho who attended its opening meeting in the Falmouth Classical School January 14, 1833.

The Stereoscopic Society has just completed its fourth year. During t past session thirty-two folios, containing 519 stereograms, have been circulat and are now being divided among the members. Last Christmas a parcel six stereoscopes and 258 slides, donated by the members, was presented to t Rev. the Warden of the Aberlour Orphanage for the use of the children, a which afforded them much instruction, pleasure, and amusement during t long winter evenings. The Society has a vacancy for one member, lady gentleman, who must be a fairly advanced worker; the entrance fee is 1*s.* 6 and annual subscription 2*s.* Further particulars may be obtained from t Secretary, Mr. Dideri, Huntly, N.B.

South London Photographic Society.—The Ninth Annual Exhibition this Society will be held at the Public Baths, Church-street, Camberwell, S. on March 5-12, 1898. The following are the open classes:—K. Pictu which have previously received an award; L. Pictures not previous medalled; M. Lantern slides which have previously received an award (s of six); N. Lantern slides not previously medalled (sets of six); O. Pho micrographs and other scientific subjects; P. Stereoscopic slides not p viously medalled (sets of four). In addition to the above, a gold medal w be offered in Class K. The Society's medals will also be awarded for the b trade exhibit, and for the most useful novelty in photographic apparatus.

National Photographic Record Association.—At a Council Meeting Wednesday, Sir J. Benjamin Stone, M.P. (President), in the chair, thir eight members were elected, and several local secretaries and collectors w appointed. Mr. Harold Baker, of Birmingham, presented some photograp of Strentham Church, Worcestershire, where Samuel Butler, the author *Hudibras*, was baptized February 14, 1612, and of some of the monume of the Russell family, also a series of photographs of Hill Croome Chur Worcestershire, in which may be seen a curious piscina across an angle the south corner, five photographs of Shobdon Priory, Herefordshire, as erected, and two of a fine cross at Cropthorne, Worcestershire. Mess Beck & Co. sent one of Her Majesty the Queen at St. Paul's, Jubilee D Mr. Edgar Scamell some photographs of London street cries, and the H Secretary some of the old Roman bath at Bath before the restoration.

Luminous paints consist partly of the sulphides of the alkaline earth meta and are produced either by reducing the sulphate with coal or by glowing t oxide or carbonate with sulphur. According to recent researches, the prod tion of these luminous colours will be considerably improved. Several ye ago Verneuil demonstrated the influence which different substances exerc on the intensity of the phosphorescence of sulphide of calcium. At one of t last sessions of the Académie des Sciences in Paris, Mourelo communicat the result of his investigations on sulphide of strontium, and also a meth to make it very phosphorescent. He described five different methods producing phosphorescent sulphide of strontium. The following was fou to be the best:—Mix 285 grammes of carbonate of strontium (impur 62 grammes of flowers of sulphur, 4 grammes crystallised carbonate sodium, 2·5 grammes of chloride of sodium, 0·4 gramme of hyponitrate bismuth in a well-pulverised state, place in an earthern crucible and co with a layer of powdered starch. The crucible is heated to red heat in oven by coke fire for five hours, and left to cool off ten to twelve hours. brittle, granular, almost white mass is taken from the crucible, which exhib a very great capacity of phosphorescence evoked by the slightest amount light.

MR. ALFRED UNDERHILL, of Clarendon-road, Croydon, writes: "I am ›ut to give a series of sacred concerts and recitals in the Large Public Hall, ›ydon, on Sundays. The first will take place on Sunday, November 28. e songs and recitations will be fully illustrated with limelight views, ›cially painted and in some cases designed by myself for the purpose. On first occasion I shall be assisted by the following *artistes*:—Miss Jenie lmer (songs, 'The Better Land' and 'Star of Bethlehem'), Mr. Arthur ntley, of the Mohawk Minstrels (songs, 'Ora Pro Nobis' and 'Alone on Raft'), Mr. Valentine Hill (recitations, 'Jane Conquest' and 'Dora,' by nnyson). Admission free, silver collection at the doors. Open 7.30, nmence at 8 p.m. During the series the following *artistes* (in addition to ›se already named) will appear:—Miss Ethel Beetlestone, Messrs. D'Arcy ayton, Booth, Wills Page, and others. Mr. W. Leigh, T.C.L., will preside the piano."

SEQUEL TO PHOTOGRAPHING A CARRIAGE.—Howard & Jones *v.* Morgan & .—The plaintiffs in this action, who carry on business in Cullum-street, C., sued the defendants, the well-known coachbuilders of 104, Long-acre, .C., at the City of London Court, before Mr. Commissioner Kerr, to recover e sum of 4*l.* 4*s.* for work done. The plaintiffs' case was that the defendants rough their manager, gave instructions for certain work to be done. The ›rk was to take a photograph of a carriage, and print a number of copies. oofs were supplied to the defendants' manager, who approved of them, but, he would not give an order for the printing, they now asked for payment the photographic work done. The defendants stated that what had been ne by the plaintiffs was purely speculative work, and that they would only ve the order for the printing provided they were satisfied with the proofs. ie proofs did not turn out satisfactory, and therefore the plaintiffs were not titled to anything. His Honour said the onus of proof was on the plaintiffs, d he would adjourn the case in order that it might be tried before a jury, herwise there would be judgment for the defendants.

THE LANTERNIST AND THE POLICE.—At the North London Police Court, on e 19th inst., Arthur Deuxbury, of Mare-street, Hackney, and Valentine reen, magic-lantern operator, of Blackstock-road, Finsbury Park, were sum-oned for causing an obstruction to the free passage of the footpath. It ›peared that the defendant's agreed that some magic-lantern slides should be ›rown on a screen over Deuxbury's shop, his goods to be advertised with ›se of other people. The first picture shown was a ship in full sail, then llowed a couple of men boxing, and a policeman trying to catch a dog. Mr. lanchard Wontner, who appeared for the prosecution, said these slides could ›ve no possible connexion with the defendant's business, and were only put to attract people to the business pictures. The result of the scheme was ›at the police had considerable difficulty in regulating the traffic. For the ›fence the defendants submitted that the neighbours had not complained, ›d therefore it had not been shown that they had committed a nuisance ithin the meaning of the Act. Mr. Wontner said there was no recent legis-tion on the subject, but he relied upon the case of the King *versus* Carlisle, ›ed in 1834, in which proceedings were taken, and a conviction obtained, ›gainst a man, who showed, amongst other views, a bishop arm in arm with a ›evil. The Magistrate: But that was a libel. Mr. Wontner: And obstruc-on. The father of the defendant, Green, said he was a dissolving-view artist. ›e denied the evidence of the police that there had been any obstruction. ›e quoted the case in which the proprietors of Pears' soap were proceeded ›gainst by the police for a similar thing. He was engaged in the case himself, ›d it came before Mr. Justice Wright and was dismissed. The magistrate ›id he would reserve his decision.

A JUBILEE PHOTOGRAPHIC STAND.—Wasson *versus* Maskelyne.—The laintiffs in this action, Mr. A. Wasson and Mr. L. Fawell, trading as Wasson ; Co., sued the defendant, Mr. J. N. Maskelyne, lessee of the Egyptian Hall, ›recover damages for an alleged trespass. It appeared that the plaintiffs re the freeholders of 4, St. Paul's Churchyard, the first, second, and third oors of which are let to Messrs. Holloway & Sharpe, Limited. The premises ›ere taken by the defendant under an agreement for the purpose of letting hem to persons who desired to see the Jubilee Procession. Outside the first-oor front window there was a projection, ranging from one to three feet. On hat projection the defendant erected a certain staging for photographic pparatus. The defendant had been warned by the plaintiffs that the pro-ection was not part of the premises that had been let to him. However, in pite of this warning, he caused the staging to be proceeded with, to the nnoyance of the plaintiffs, and substantial damages were asked for. Mr. V. A. Rouch, manufacturer of photographic apparatus, stated that, in his pinion, the projection over the plaintiffs' premises was the most perfect site or taking photographs of the Jubilee Procession. He should say that the ›alue of it would be 20*l.* For the defence it was contended that the defendant ›sed the projection over the plaintiffs' premises in accordance, as he thought, vith the rights under the agreement with the tenants of the premises. The ›remises were let for the sum of 800*l.* It was alleged that the action was ›rought out of spite, because the defendant would not take part of their ›remises. The defendant stated that, although a staging was erected on the fternoon before Jubilee Day, for a camera to be placed there, no photographs ›ere, as a matter of fact, taken of the procession, because the site was bad, nd only the backs of the persons forming the procession could be taken. The ury returned a verdict for the plaintiffs, and awarded them one farthing lamages; but, as the defendant had paid 40*s.* into Court, the Judge at the ›ord Major's Court, at which the above case was tried, gave judgment for the lefendant with costs.

Patent News.

HE following applications for Patents were made between November 10 and November 17, 1897:—

SENSITISED PAPER.—No. 25,933. "A New or Improved Process for the Treatment of Sensitised Photographic Paper." A. SCHWARZ.

INK PHOTOGRAPHY.—No. 26,122. "Benham's Ink Process of Photography." C. E. BENHAM.

SHUTTERS.—No. 26,197. "An Improvement in the Mechanism of Photographic Roller-blind Shutters for obtaining both Time and Instantaneous Exposures." B. W. ORTON.

PRINTING FRAMES.—No. 26,208. "Improvements in Photographic Printing Frames." C. A. MCEVOY.

PLATE-CHANGING APPARATUS.—No. 26,246. "Improved Apparatus for Changing Plates or Films in Field and Magazine Cameras." W. A. VÉREL, JUN., and W. EYRE.

ANIMATED PHOTOGRAPHY.—No. 26,341. "Improvements in Animated Photograph Machines." W. J. H. JONES.

PRINTING FRAMES.—No. 26,390. "Improvements in Photographic Printing Frames." Complete specification. J. WILKINSON and A. WILKINSON.

CHANGING APPARATUS.—No. 26,439. "Improvements relating to Film Changing in Photographic Apparatus." A. H. HARMAN.

CAMERAS.—No. 26,440. "Improvements in or relating to Magazine Cameras and the like." A. H. HARMAN.

ANIMATED PHOTOGRAPHY.—No. 26,460. "Improvements in Apparatus for Exhibiting Animated Pictures." P. MORTIER, C. ROUSSEAU, and G. ROUSSEAU.

PRINT TRIMMER.—No. 26,483. "An Improved Photographic Print Trimmer." J. S. SMITH.

PHOTOGRAPHIC BACKGROUNDS.—No. 26,522. "Improvements in Backgrounds applying to Photographs in general Plain and Coloured on Opaque and Transparent Substances." J. A. SALMON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
29	Bradford Photo. Society	*A Tour in Western France and the Pyrenees.* J. W. Laycock.
29	Camera Club	*The Land Fiords and Waterfalls.* Andrew Pringle.
29	Croydon Camera Club	Special Trial Night for Slides to be shown in public on December 8.
29	Ealing	*Reducing.* H. W. Peal.
29–Dec. 1.	North Middlesex	Annual Exhibition.
29	Richmond	*Photographic Tinkering.* G. Ardaseer.
30	Birmingham Photo. Society	*Negative-making.* John A. Hodges.
30	Brixton and Clapham	*Architectural Photography.* C. H. Oakden.
30	Camera Club	Testing Lantern Slides in the Studio.
30	Hackney	*Carbon Process.* John H. Gear, F.R.P.S.
December.		
1	Borough Polytechnic	*Lenses.* Thomas R. Dallmeyer, F.R.P.S.
1	Coventry and Midland	*Enlarging.* F. Lewis.
1	Croydon Camera Club	*Photography in Natural Colours.* F. E. Ives.
1	Edinburgh Photo. Society	*A Novelty in Interior Photography.* G. G. Cunningham.—*The Cinematograph.* Messrs. Wallis and Fraser.
1	Kingston-on-Thames	Beginners' Night: *Carbon Printing.*
1	Leeds Camera Club	Lecture by Mr. Cowburn.
1	Leytonstone	*Chat about Lenses.* Rev. F. C. Lambert.
1	Photographic Club	Demonstration of the Gum-bichromate Process. J. Packham.
1	Southport	(3) Slide Competition.
2	Bolton Mutual Photo. Society	*At Home Subjects.* Mr. Marsden.
2	Camera Club	*Photo-micrography.* Dr. Spitta.
2	Darwen	*Retouching.* F. Fielding.
2	Leeds Photo. Society	Annual Meeting.—Lantern in Use for Testing Members' Slides.
2	Leigh	*Cloud Photography.* A. Horsley Hinton.
2	Liverpool Amateur	Lantern in Use.
2	London and Provincial	*Optical Projection.* T. E. Freshwater.
2	Manchester Amateur	*How to Manipulate the Lantern.* F. W. Parrott.
2	Oldham	*The Infallible Hand Camera.* S. D. McKellen.
2	Woodford	*On the Use of Long and Short-focus Lenses.* E. Marriage.
3	Borough Polytechnic	*Printing-in Skies.* A. Bedding.
3	Croydon Microscopical	*A Holiday in the Scilly Islands.* F. H. Carr.
3	Liverpool Amateur	Prize Slides.
3	West London	*Hints to Beginners.* L. Selby.
3	Wolverhampton	*Rock Climbing in the Dolomites.* Walter Barrow, C.A.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 16,—Photo-mechanical Meeting,—Mr. F. E. Ives in the chair.

A REVIEW OF TRIPLE-PRINTING METHODS.

Mr. E. SANGER SHEPHERD read a paper with the above title, referring particularly to methods of three-colour printing other than from half-tone type blocks, and prefacing his remarks by a statement of the general principles underlying the three-colour process, the first suggestion of which occurred in a paper by Ducos du Hauron in 1859, although Professor Clerk Maxwell was the first to carry the theory into practice. The investigations of Dr. Vogel were detailed, as were also those of Mr. F. E. Ives, who published in 1889 the first complete explanation of the true scientific theory forming the basis of three colour methods, and the historical portion of the subject was

thus summarised: Du Hauron first suggested, and afterwards worked out many of the details; Clerk Maxwell gave the first colour curves from actual measurements; Vogel gave colour-sensitive dry plates; and Ives showed not only how to make coloured prints, but also propounded the true theory of how to secure an accurate reproduction of the colours, a theory the truth of which he had repeatedly proved under test conditions. The paper next proceeded to deal with the utilisation of the three negatives for the production of transparent positives for lantern projection or for viewing in the photochromoscope, and for making coloured prints by superposition, and methods for obtaining three-coloured positives were dealt with in detail, it being premised that the three colours giving the best result were a pink, a bright lemon-yellow, and a greenish blue. The collodio-chloride process, as adapted to the making of the positives, was first described, and some excellent results by Mr. W. Brooks, of Reigate, were referred to; a method of printing the yellow and pink positives, based upon the primuline process, was mentioned, and Mr. Ives's plan with an ordinary celluloid film sensitised with a bichromate salt—the colourless relief being dyed to the required tint—was fully detailed, some transparencies by this method being shown in the lantern at the conclusion of the paper. The Woodburytype process, however, was that which, with certain modifications, afforded, in the lecturer's opinion, the most promising field for experiment. For making the Woodburytype mould he recommended a mixture of two pounds of powdered sulphur and two pounds of powdered black lead, heated together in a saucepan and stirred until liquid as water, in which condition it should be poured over the plaster cast, the resulting mould being very suitable for the purpose in view.

Mr. L. WARNERKE asked whether Mr. Shepherd used liquid colour filters or glass colour screens in making the negatives.

Mr. SHEPHERD said it was immaterial which were used; the crux of the question lay in making the colour screen to match the Maxwell colour curve. If one took an isochromatic plate, possessing some red sensitiveness, and prepared a colour screen which in photographing the spectrum would give a density curve approximately corresponding to the density curves given in Maxwell's diagram, that screen would be found efficient for the purpose.

Mr. WARNERKE asked what plates were specially suitable for each colour.

Mr. SHEPHERD did not believe in using different plates for the different colours, because no two emulsions gave the same scale of gradation.

Mr. WARNERKE advocated the use of Spence's metal for making Woodburytype moulds, and suggested that coloured transparencies might be obtained by incorporating suitable colouring matter with a chloride emulsion.

The CHAIRMAN quite agreed that for all purposes of three-colour work the negative should be made according to Maxwell's curves, which were really colour-mixture curves and not colour-sensation curves. The belief of some writers that, if one could not have printing colours which exactly fulfilled the theoretical requirements, one should modify the screens for making the negatives to suit the printing colours, was, he thought, due to Dr. Vogel's publication of an alleged principle in colour printing, that the printing colour should have an absorption exactly corresponding to the action of light in the negative that the printing colour was used to represent. He had no hesitation in saying that it was quite impossible to make three negatives of any object, in accordance with Maxwell's curves or by any other mixture of spectrum rays, and then to make triple-colour prints, using colours the absorption of which represented the distribution of action in the spectrum in photographing through the colour screen, and to get even a decent approximation to the colours of the object. Mr. Ives proceeded to deal at some length with the question of the preparation of colour screens. Assuming that with a Lumière's panchromatic plate it was desired to make a negative to represent Maxwell's curve for the red, the most suitable colour filter could be made by adding a little fuchsine to such a dye as brilliant yellow, testing the screen by photographing the spectrum and changing the amount of dyestuffs until the distribution of density produced the effect upon the eye which was suggested by the curve. For a screen for use with the same plate to represent the green, it was necessary to cut off the action in the red and blue, and this could be done by using chromium green glass, to which it was sometimes necessary to add some yellow, testing until a photograph of the spectrum showed the second Maxwell curve. For the third negative—to represent the blue—he used a light green glass in combination with some blue-violet dye. It must be remembered, however, that these screens, which would give proper distribution of action for the three negatives with a panchromatic plate, would give utterly wrong results with any other kind of plates; it was not a question of the colour of the screen, but of the relation borne by the colour of the screen to the distribution of sensitiveness in the plate. He did not find it necessary to change his filters for different batches of emulsion of the same make, the variation being very slight.

Some further discussion took place, after which the meeting closed with votes of thanks to Mr. Shepherd and the Chairman.

NOVEMBER 23,—the Right Hon. the Earl of Crawford, K.T., F.R.S. (President), in the chair.

THE NEW RULES.

The proceedings opened as an Extraordinary General Meeting for the confirmation of the resolution passed on November 2, adopting new Articles of Association. The confirmatory resolution was proposed by the PRESIDENT, seconded by Mr. W. E. DEBENHAM, and carried unanimously without discussion.

The meeting then resolved itself into the usual monthly Technical Meeting, the President again taking the chair.

THE AERIAL GRAPHOSCOPE.

Mr. ERIC S. BRUCE, M.A., F.R.Met.Soc., read a paper entitled *Photographs of the Optical Projections in Space produced by the Aerial Graphoscope*. The author disclaimed any intention of introducing these photographs as any practical development of photographic art, but brought them forward purely as a scientific experiment. He remarked, however, that, though they did not show promise of practical application, this did not detract from the value of an experiment which had been carried out and exhibited entirely for its own sake; indeed, it had often happened that a laboratory experiment has blossomed into utility, perhaps years after its discovery, or even years after the death of its investigator. The aerial graphoscope consists of a narrow lath of wood, painted white in front, with a grey centre gradually diminishing in shade to white, and, when rapidly revolved, a picture thrown upon it by means of an optical lantern is seen apparently in space and in relief, the explanation being that, as the lath revolves, it receives the different portions of the picture in turn, and, by reason of the persistence of vision, the observer sees the whole of the picture. When an object, such as a lighted candle, a vase of flowers, or anything else, is placed behind the revolving lath, this real object is seen through the image thrown upon the lath. The instrument was shown in operation, several rather weird and some very beautiful slides being used for the purpose of demonstration, as were also some photographs of the aerial image, the negatives having received exposures of from ten to twenty five minutes.

The PRESIDENT asked whether Mr. Bruce had tried the projection of "animated photographs" upon his revolving lath? It appeared to him that the flickering so generally noticed in these exhibitions might be obviated if the recurrence of the lath in its movement could be made to coincide with the speed at which the films were passed through the lantern.

Mr. BRUCE said he had tried this experiment, but the shutter of the projection apparatus produced an appearance like a Maltese cross upon the image, although he thought this might disappear if the speed of the lath and the lantern mechanism were the same. He had also tried the effect of dispensing with the shutter, but again with unsatisfactory results. The speed of the lath in the demonstration was about 700 revolutions per half minute, the lowest speed at which a continuous image could be seen being about twenty seven per half minute. He did not think that persistence of vision entirely depended upon the retina; the brain also had a great deal to do with the phenomenon, a sharp youth would see the aerial image much more readily than a dull one.

Mr. W. E. DEBENHAM suggested that a more brilliant picture would be obtained if sectors, equal in area to about half the area of the circle of illumination, were used instead of a single lath, but

Mr. BRUCE thought this would destroy the impression of an image in space, the screen would be too obvious.

After further conversational remarks, Mr. Bruce read a second paper, the subject of which was

PROBABLE PROJECTION LIGHTNING FLASHES.

Remarking that there could be no better example of the value of photography in scientific research than the revelations of the photographs of lightning, he proceeded to detail the action of the Royal Meteorological Society which led to the classification of flashes into six typical forms, namely: (1) Stream lightning, apparently of rare occurrence; (2), Sinuous lightning, the common type; (3) Ramified; (4) Meandering; (5) Beaded; and (6) Ribbon lightning, which appeared to arise, in some cases at all events, from photographic causes and not to be a real type of lightning flash. In this classification the angular zigzag form of lightning, so often depicted by artists, was conspicuous by its absence, and it had more than once been denounced by scientists as existing only in the painter's imagination, but the author of the paper, as in previous communications to the Royal Meteorological Society and the British Association, contended that this traditional form was not only possible but probable, and he showed a photograph of a lightning flash which he regarded as nearly approximating to the angular zigzag type. His theory was that, if there were an obstructing cloud between the lightning flash and the reflecting clouds which acted as a projection screen, in the form of a cloud with a small opening in it, the optical projection of the flash must appear on the clouds which would otherwise have been illuminated by sheet lightning, and that, if the surface of the receiving clouds were irregular, the projection of the flash would take the shape of the irregular surface, and there would be presented a flash very different from the original. Experiments were shown to prove that a smooth streak of light, like a "streaming" lightning flash, appeared as a zigzag flash if projected upon the irregular surface of bunches of cotton-wool built up as a model of cumulus clouds; and that, if there were more than one opening in the obstructing cloud, there would be a reduplication of the flashes, giving multiple effects, like "ribbon" lightning.

Mr. A. S. HAWKES sent some interesting photographs of lightning for exhibition, and considerable discussion followed, in which the views advanced by Mr. Bruce received some adverse criticism.

INTERFERENCE COLOUR PHOTOGRAPHY.

Professor Gabriel Lippmann is announced to read a paper on his process of interference colour-photography at the next meeting of the Society, to be held on December 14, and members and others who intend to be present on the occasion should note that the meeting will be held at a place to be subsequently announced, presumably not at the Society's rooms in Hanover square.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 18,—Mr. A. Mackie in the chair.

Mr. PHILIP EVERITT said he had often been spoken to on the subject by photographers, who had found that a comparatively large lens was slower than a smaller one of the same aperture; and, in putting forward this question for discussion, he observed that there was certainly some ground for the belief. This was to be found in the greater thickness of the glass forming the larger lens, in addition to the fact that the area of the large-sized lenses was generally smaller relatively to the plate for which they were listed, involving a consequent less exposure at the margins. He referred to a lens of very great diameter at Potsdam Observatory, with which, owing to the thickness of the glass something like forty per cent. of the light was lost.

Mr. A. HADDON considered that, in any serious test of the truth or otherwise of this question, lenses of the same series of different focal length should

employed. Theoretically, putting aside the thickness of the glass, there nothing to account for it.

Mr. Everitt was asked to go into the matter and report his conclusions.

Mr. W. D. WELFORD gave a lecture on a camping-out trip up the Thames, strated by numerous lantern slides from photographs taken during the fort-ht occupied by the journey. The lecture was plentifully seasoned with norous and satirical passages, and described the life and experiences of two n dependent on their own labours for progress, and responsible for their n cooking and housekeeping. No work that could have been avoided peared to have been done, and this was the advice given to prospective aping parties—to take it easy, to move only so long as the inclination mpted, to make no plans as to when they should start and where they uld stop, making everything subservient to personal comfort and con-nience.

Mr. Freshwater will give a few notes on optical projection on December 2, en Mr. Ives's photo-chromoscope attachment will be shown.

PHOTOGRAPHIC CLUB.

OVEMBER 17,—Mr. E. Crofton in the chair.

Mr. Holt showed a number of coloured prints, the work of Messrs. Swain & n. These were produced by the three-colour method from negatives nsitised for the three colours—yellow, red, and blue, and were obtained th three printings only as compared with the original of one of the amples—a coloured lithograph—which required fourteen separate printings. me of the prints were from nature.

Mr. E. W. FOXLEE gave his promised chat on the items of historical interest ing to make up the photographic section of the recent Jubilee Exhibition the Crystal Palace. Some of the exhibits in question themselves were own during the evening, and these with the others formed the basis of a ost interesting talk; but, on account of the extensive ground covered, only brief notice can be given. First amongst the objects described was an old bum formed by Mr. R. Willats in 1840, the oldest print dating back to 39. It included specimens not only of early silver and other prints, nerally in very good condition, but specimens of several old processes that e now being worked with slight modifications, in addition to autographs of number of well-known photographic men and portraits of pioneers of photo-aphy. A notable exhibit was that lent by Mr. Bruce, who for thirty years ad used the collodio-chloride process for printing, consisting of three amples of his work which had appeared at the (now Royal) Photographic ociety's Exhibition. These were the identical prints exhibited, and showed o change after so long a time. The speaker observed that some people had ondemned the German collodio-chloride papers, but he happened to know at these particular examples had been made on paper of German make. lention was made of a direct photograph, 24×18, taken in 1867 of Furness bbey. The plate was prepared by Mr. Green by the collodio-bromide rocess—the first process, not as we know it now, *i.e.*, a washed emulsion, ut that in which the plate was washed after coating. The prints were on lbumenised paper, but not one showed any sign of fading, good evidence that lbumen prints do not necessarily fade. Of photo-mechanical interest was an xhibit of a chromo-Woodburytype produced by lithographing about three olours upon the mount, and on these impressions to superimpose a Woodbury rint, very excellent results being obtained. Next in importance were some hoto-lithographs in half-tone by Mr. Bullock, made in 1866, which in Mr. oxlee's opinion would hold their own against much of the work of the resent day. Following these was a series of photographs of oil paintings by ixon & Sons, consisting of two examples of each subject, the one on an rdinary plate and the other on an orthochromatic plate. Credit was given o the firm of Dixon & Gray for introducing orthochromatic photography into ngland. Carbon prints without transfer by Mr. Pouncy were also on view, nd it was observed that this process had lately been reintroduced under the ame of the gum-bichromate process and photo-aquatint. Examples of the rtigue process were exhibited, but these were not to be confounded with the um-bichromate process. The examples of Swan's carbon process by double ransfer were also touched upon. A carbon print of the Royal Family at Windsor was instanced as an example of the permanence of this process. The nonochrome from which it was taken had gone fearfully, and the whites were uite yellow. As an instance of the habitual reinvention of old processes, ttention was called to an item in the catalogue in the shape of a bas-relief ortrait of a lady produced in 1875; the idea was lately reintroduced, but the xample would hold its own. Mrs. Smith lent an early example of photo-ravure, the invention of Mr. Woodbury. A Woodbury relief was made, the issue being charged with gritty matter. Having been developed, the print resented a gritty surface, from which a plate for printing was eventually btained. Mr. Pouncy showed a photo-lithograph in half-tone made in 1859. Etchings by Mr. Foxlee himself, interesting in that only one solution was sed, as recently again introduced, were described, but no advantage he hought attached to this method. Negatives by the albumen process were xhibited by Messrs. Negretti & Zambra. Taken in 1854–6, the detail they ossessed was very fine and the distance admirably reproduced. Passing on o some waxed-paper negatives which were often confused with calotypes, Mr. Foxlee explained the difference. In the case of the latter, the raw paper was iodised, sensitised with gallo-nitrate of silver, and exposed wet within a hort time of preparation. The waxing was done after the paper had been ixed and dried. In the waxed-paper process, the paper was waxed first and ensitised with an acidified solution of silver nitrate. This would keep for a onsiderable time, and was exposed dry, but required six to ten times the xposure for the calotype paper. A large collection of Daguerreotypes was ent to the Exhibition, and amongst these was an electrotype copy, the ossibility of which did not seem to be much known. Amongst the apparatus was an old form of Daguerreotype slide, date 1843, the carrier of which lifted out, the idea being to transfer that and the plate to the mercury box for development. Turntables were shown to be not such novel things as imagined a camera so fitted forming one of the exhibits, and being provided moreover with levelling screws. This had been since patented. An old form of stereoscopic camera, the base of which was arranged to allow the camera to be run along sideways for the two views to be taken, was shown. This was made in 1857 for use with wet collodion, and accompanying it was a negative of Saltash Bridge taken in 1858. A most interesting discourse was brought to an end by a word or two on the fading of albumen prints. One on this paper done forty years ago, and mounted on a piece of common cardboard with gum arabic, was described as showing no trace whatever of fading, notwithstanding that it had been fixed in the old toning and fixing bath.

A vote of thanks was passed to Mr. Foxlee.

Brixton and Clapham Camera Club.—November 16.—A lecture on

PHOTOGRAPHIC ADVANCES OF THE LAST FEW YEARS,

by Mr. T. C. HEPWORTH, F.C.S., was read by the Secretary. The applications of photography to newspaper illustration, to astronomy, to the record of rapid motion, as Muybridge's photographs of the trotting horse, and Professor Boy's photographs of flying bullets, the principles of the cinematograph, X rays, recent inventions in lenses due to introduction of Jena glass, &c., were all ably explained and well illustrated with lantern slides. At the conclusion of Mr. Hepworth's paper, Mr. F. W. LEVETT supplemented it by giving a review of what had been accomplished in colour photography, describing Lippmann & Lumière's work, three-colour printing, Ives' photochromoscope, &c.

Camera Club.—On Thursday evening, November 11, Mr. ERNEST MARRIAGE lectured on

WORK WITH A TELE-PHOTOGRAPHIC LENS, PRINCIPALLY ARCHITECTURAL, BUT WITH SOME HINTS ON LANDSCAPE,

illustrating the subject by means of a set of lantern slides in series, each series being reduced to the same extent from negatives taken without altering the position of the camera, so as to show the precise advantage obtained by using a tele photographic lens. In the course of his remarks the lecturer alluded to the importance of strength and rigidity of the camera and tripod for successful tele-photography, and exhibited his own apparatus, which he particularly recommended for any form of architectural work, the special features of the camera being that the back could be swung 30°, and that the lens could be raised two and a half inches. He did not advise tilting the camera, and swinging the back in conjunction with the use of ordinary positive lenses, in which case he thought it better, when possible, to get the subject on the plate by raising the lens and keeping the back upright. The defining power of the tele-photographic lens was less seriously affected than an ordinary positive lens by swinging the back. He had swung the back as much as 24° without spoiling the negative, and considered 15° to 20° nothing abnormal. The covering power, however, was not great, and consequently the alternative plan of raising was generally inapplicable. He had not tried the effect of raising and then swinging the lens, and did not know whether it was practicable with any camera of reasonable dimensions. To get results similar to an example shown, the lens would have to be raised six inches from the centre of the plate, with a camera extended to twenty inches. Of the various tele-photographic combinations that he had tried, the performance of a universal symmetrical lens, working at *f*·5·6, fitted with a negative lens of half its focus, had pleased him best, and he was inclined to think that such a positive lens was better for this special work than the more modern forms of lenses with a flatter field. Combinations in which a portrait lens formed the positive were not, on the whole, to be recommended for architectural subjects, the positive lens being rather bulky, and of no use for any other purpose. For use on a half-plate camera he preferred a six-inch positive with three-inch negative attachment. Enlargements made in the ordinary way could not show definition as good as direct enlargements with a tele-photographic lens, even if special attention were given when exposing the small negative to the piece of the subject to be subsequently enlarged. As the covering power of the tele-photographic lens and the size of the image, increased with the extension of the camera; and, as the gain in size was accompanied by a loss of rapidity, it was necessary to find out the intensity of the lens for the particular extension in use, and the method recommended was as follows: First find the distance from the negative lens to the focussing screen, divide it by the focal length of the negative lens, and add one to the result, which would give the magnification; second, multiply the *f* number of the aperture of the positive lens by the magnification, and the product would be the intensity of the combination expressed in the same terms. The lecture was followed by a short discussion, in the course of which Mr. FERGUSON said he had been puzzled as to what amount of stopping down was necessary when the back was inclined to about 30°, and he asked whether, in that case, it was essential to stop down to, say, *f*·32 on the original lens, or whether, owing to the very little difference in definition caused by the extension, it was sufficient to work with *f*·6? His method of calculating exposures was as follows: Working with a six-inch lens and tele-photographic attachment, he placed his finger at a distance of six inches from his eye, and noted how much of the finger was covered by the object to be photographed, and when the image had been focussed on the ground glass he again placed his finger between the object and his eye, and noted the distance at which the image included on the ground glass just covered the space occupied when the finger was at 6 inches distance; then, supposing his hand was extended 30 inches, or five times the focal length of the lens, he multiplied the *f* number of the stop by five, and reckoned the exposure accordingly. Professor KENNEDY had got very fair results by multiplying the stop number by the square of the linear magnification. Mr. T. R. DALLMEYER said that it was, no doubt, rather difficult for some persons to understand how it was possible for Mr. Marriage to have got such excellent definition with such an extreme amount of swing to the back; as a matter of fact, however, he had formed an exceedingly attenuated pencil, and had given what amounted to somewhat rapid pinhole exposures. Mr. Ferguson's system of calculating exposures was perfectly sound from a scientific point of view, and was quite practicable. For ordinary purposes, if the intensity of the positive element was sufficiently high for the purpose for which it was to be employed, a lens with slight

ordinary curvature would be better than one which gave an absolutely flat field, *per se*. Mr. MARRIAGE said, in reply to Mr. Ferguson's question, that he did not think there was much advantage in stopping down beyond *f*-11 or *f*-16.

Croydon Camera Club.—The meeting at the Club rooms was, on Wednesday, the 17th, devoted to lantern slides. Several new exhibitors of slides were noticeable for their good work, including Messrs. Fuller, Wilcox, and Jeffries, who, between them, showed a fine assortment of West of England and other scenes. Others whose slides were inspected were Messrs. Taylor, Rogers, J. Smith, A. J. Noaks, Watson (including some very delightful studies in Norwich Cathedral), Hodges, and L. G. Kough, who showed a number of slides of various pleasing tones, developed with the new reducing agent, ortel. Mr. Smith handed round an interesting window transparency of a Jubilee scene; Mr. Rogers a little print in gum-bichromate, notable for its delicacy of finish and tone; Mr. Kough a print illustrating the ill effects liable to arise where toning of P.O.P. is effected after fixing instead of before. An ether saturator was tried to intensify the lime light. Objection was taken to the smell and noise attending its use.

Kingston-on-Thames and District Photographic Society.—A demonstration of lantern-slide making by Messrs. East, Hodgson, and Armfelt.—Slides were made by contact and reduction on various makes of plates; and the carbon process, as well as the transfer process from Novitas paper, was shown. The slides, after being bound, were shown on the screen with others. Mr. E. A. Smith showed a novelty in the manner of binding slides which was very much admired. By his process the slide appears on the screen very tastefully framed and titled, making a very charming little picture.

North Middlesex Photographic Society.—November 15, Mr. Henry Smith in the chair.—Mr. E. R. MATTOCKS gave a demonstration on

P.O.P. TONING.

He compared the various toning baths in general use, and pointed out that, if cold tones were wanted, sulphocyanide of ammonium and gold supplied them, while the potassium chloro-platinite bath gave pleasing brown tones with solio and other papers. He toned some prints in these two baths and passed them round. He said the sulphocyanide bath was apt to give double tones, unless care was used to have it in proper condition (neutral), and the prints should be well washed first. The competitions, Architecture and Twilight, were then adjudicated upon, resulting in Mr. G. J. Haviland winning the Architecture competition, and Mr. W. Taylor that for Twilight.

Putney Photographic Society.—November 18, Mr. L. S. Zachariasen in the chair.—Mr. G. H. Moss, of the South London Photographic Society, read two papers on

COLLODIO-CHLORIDE and PLAIN SALTED PAPERS.

He said that, no doubt, many amateur photographers thought the preparation of their own printing papers an operation which was surrounded by difficulties and uncertainty, and had for that reason never given the process a trial. He would endeavour to show that this was a mistake. The chemicals required were few, the manipulation simple, and the results both more pleasing and certain than generally obtained on commercial papers. Referring to the collodio-chloride process, he said it was first introduced in 1864 by Mr. Wharton Simpson. Owing, however, to various difficulties, it did not then come into general use. These having now, to a great extent, been successfully overcome, the process has been revived; and, as it is capable of rendering the finest results with ease and certainty, it will, no doubt, become very popular in the near future. He had made a long series of experiments in connexion with the emulsion and the treatment of papers coated with it, and he could recommend the following formula for the emulsion, viz., 1st: Zinc chloride, 12 grains; tartaric acid, 5 grains; citric acid, 5 grains; dissolved in 1½ ounces methylated sulphuric ether. 2nd: Silver nitrate, 60 grains; dissolved in 30 minims distilled water by heat, to which is added 100 minims pure glycerine, 4 ounces methylated alcohol, and 60 grains gun-cotton; well shake and add 1½ ounces ether. When this is dissolved, it should form a greyish-white emulsion of silver in collodion. The process, up to this point, may be carried on in full daylight, but the sensitive solution must be made up by artificial white light. To make the emulsion, No. 1 solution, containing the chloride and the acid, must be added gradually, a few drops at a time, to No. 2, well shaking the bottle after each addition. When all is added, well shake for five to ten minutes, so that the emulsion may be thoroughly mixed. On this success depends to a great extent. The bottle containing the emulsion should now be put aside for about twelve hours to allow all impurities to settle, after which the contents should be either filtered through cotton-wool or carefully decanted into another bottle. It is now ready for coating the paper. The emulsion will keep well in a dark place in a well-corked bottle. If a red bottle be used, it may be handled in daylight without fear. The gun-cotton should be that known as "high temperature," specially made for emulsion processes. It may be obtained from Messrs. Rouch, or elsewhere. The emulsion must not be used near a gas flame, as the ether very quickly ignites. Opal, glass, lantern slides, &c., may be coated, but a substratum is necessary or the silver would crystallise on the glass. The following solution answers well and keeps indefinitely: Egg albumen, 2 drachms; add acetic acid, 1 drop; water, ½ drachm; well stir up and filter. After settling for two hours, add 2 drops of liquor ammoniæ. The most suitable paper is that sold for emulsion purposes, and known as Baryta paper. The coating is a simple matter; the paper is held in a double frame, the lower part of which is a plain board, to which is hinged the upper part, which has an opening in it to correspond with the size to be coated. The paper, cut about one-eighth of an inch larger all round, is inserted between the two parts, which are then clamped together by a pair of clips. The frame now forms a shallow, nearly water-tight dish. The emulsion is poured on to cover the paper, the dish gently rocked, and the superfluous emulsion run off at a spout in one corner. After a few seconds the emulsion will have set, and the paper may be taken out of the frame and hung up to dry. This will generally take from one to two hours, but care must be taken that the paper is thoroughly dry before being put into contact with a negative, which it would otherwise spoil. Collodio paper will be found to print more rapidly than albumen or gelatine paper especially in winter, as it is more sensitive to the yellow rays. The pape should be printed until the heavy shadows are slightly bronzed. The print must be well washed before being placed in the toning bath. Any toning bat may be used, either platinum or gold, or a mixture of both. There is n tendency to double toning or discolouration of the whites. The followin bath may be recommended: Acetate of soda, 40 grains; water, 8 ounces; gol chloride, 2 grains; then add 3 to 4 drops saturated solution of chloride lime. This bath improves with age. If found to tone too fast, add wate Any tone from red to black may be readily obtained in the same bath, it simply a question of time. It should be remembered that the prints will dr of a considerably colder tone than they show when wet. After toning, wa well, then fix for about about fifteen minutes in hypo, 1 ounce; water, 1 ounces; then wash well for about an hour. The prints may be burnishe with a bar or roller burnisher. Castile soap, dissolved in a little water, shoul be used for lubrication. *Plain Salted Paper.*—Any kind of paper may b used, from the thinnest to the thickest, smooth or rough surface. Beginne should first try the thin paper, such as Rives, as they are more easily manipu lated. When a certain skill has been attained, the thick papers may be trie The first operation is the "salting." After considerable investigation an experiment, carefully carried out, Mr. Moss could recommend the followin formula: Sodium chloride in crystals, 150 grains (*not table salt*); ammoniu chloride, 100 grains; potassium bichromate, 4 grains; water to make 2 ounces. The solution should be used in a deep dish, so that the paper may b entirely immersed; floating is not sufficient. The paper should be soaked i this bath for three to five minutes, according to thickness, then hung up t dry. In this state the paper will keep indefinitely, so that a quantity may b prepared and put aside to be sensitised as required. The following sensitisin bath may be used: Silver nitrate, 1 ounce; citric acid, 150 grains; distille water to make 8½ ounces. The paper should be floated on this bath for abou two minutes. The thick drawing papers will generally show a tendency t curl up at the edges, but this can be remedied by breathing along them. Th best way to float the paper is to get hold of the upper right and lower lef hand corners, bending the paper downwards, so that the middle will touch th solution first, then gently lower the corners. If properly done, all air bubble which may form will be driven out. To ascertain if this has been done, lift u each corner and, if any bubbles are found, break them with a glass rod or piec of vulcanite, and then let the paper down on the bath again. When sensitise the surface of the paper will be of a light primrose colour; and, if any ai bubbles have formed through careless floating or grease, white patches wi show where the paper is not sensitised. The strength of the bath should no be allowed to get below 50 grains of silver per ounce of solution for thic or rough papers, and not below 40 for Rives or Saxe papers. When the bat becomes weak, the primrose colour on the surface of the paper will be le pronounced, and the resulting prints will be lacking in vigour. If the bat becomes discoloured by organic matter after using, put it in daylight until th impurities are thrown down. The bath is then in working order again. flat porcelain dish is the best for sensitising the paper, and it should not b used for any other purpose. The paper is dried after sensitising. It will kee for about a month or six weeks if kept under pressure in a suitable place Print a little deeper than the result desired when finished. Wash well befor toning. The following toning bath will answer well: Acetate of soda, 30 grains gold chloride, 1 grain; water to make 8 ounces. After toning, rinse in thre or four changes of water, and fix in hypo, 1 ounce; water, to make 8 ounces ten minutes for thin, up to twenty minutes for thick papers; and use a fres bath for each batch of prints. After fixing, wash the prints from one to thre hours, according to the thickness of the paper. Warm water may be use without ill effects on the prints. Any tone up to a warm black may b readily obtained. The detail equals that of any P.O.P. The yellow colour the sensitised paper disappears in the first washing water. A very effectiv thick washing paper, requiring no mounting, is sold by the Autotype Compan under the name of "Rough-surface toned etching paper." If printed with margin of, say, two inches for a half-plate, and impressed with a plate mar a very good effect is obtained. The plate-marking may be easily done b putting the print, when slightly damp, in a letter-copying press, betwee blotting-paper, with a piece of iron or zinc the size of the plate mark on th top. A piece of tissue paper should be placed between the print and th plate, then screw down tightly, and leave for about an hour. Fine tones suitable for some subjects, may be obtained by simply fixing the prints, car being taken to wash very thoroughly for about ten minutes before placin them in the fixing bath, otherwise the whites will be degraded. Mr. Mos illustrated his lecture with practical demonstrations, which made it quit obvious that the two processes dealt with are well within the powers of an amateur who may like to give them a fair trial. The results, of which some fine examples were handed round, certainly excelled those generally obtained on commercial papers.

Birmingham Photographic Society.—November 16.—A demonstration upon

CARBON PRINTING,

including single transfer with ready-sensitised tissue of various colours upon different kinds of paper, and double transfer, with preparation of opal as a temporary support, &c., was given by Messrs. P. F. DEAKIN and W. F. GREATBATCH. Mr. DEAKIN, in the course of his remarks, showed upon the blackboard the theory of carbon printing, and, after passing round a numerous assortment of papers used as supports for single transfer prints, proceeded to demonstrate his method of development. To show the latitude in exposure and development, Mr. Deakin had carefully prepared three prints from the same negative, giving a different exposure to each, and modifying the development in each case. The results went to show that, with suitable treatment, a great deal might be done in the way of producing brilliant prints from "soft" negatives, &c. During development, Mr. Deakin showed how local development could be done by the aid of a brush moistened with warm water. Cloud effects were produced, and black shadows considerably reduced.

GREATBATCH demonstrated the sensitising of tissue, the production of parencies, and the double-transfer process. In sensitising, the use of a :ype plate was advised, on which the sensitised tissue should be squee- and allowed to dry. Prints had been prepared in the different stages of :ess, in order that every operation might be demonstrated.

.rwen Photographic Association.—On Thursday evening, November 11, S. D. MCKELLEN, of Manchester, gave a demonstration on his latest hand ra,

THE INFALLIBLE.

lecturer said, and also proved, that the word infallible described the ra thoroughly, as it was an impossibility for any portion of the mechan- to fail in its working. It allows a dozen plates in sheaths to be used at ure without changing the mechanism, removes the plate and lays it down ie receiver, and clips it in position, so that it cannot move about, also s the next plate in position for exposure by means of a key; all this can complished, no matter in what position the camera is held. If you wish amine the lens, the front door is opened by means of a catch; this catch, pressed to open the door, automatically covers the back of the lens by is of a shutter, so that it is impossible for light to be let into the camera cident through the lens when opening the door.

ewcastle-on-Tyne and Northern Counties Photographic Society.—At Ordinary Meeting of the Society, held on November 9, Mr. W. Parry sident) in the Chair, the members inspected the annual competition work. e was a marked falling off in the amount of entries as compared with last , some of the classes having practically nothing entered. The pictures judged by Mr. Wm. Milburn, of Sunderland, and the following were his rds:—Landscape, silver medal, Mr. M. P. Hutchinson; Marine, silver al, Mr. Godfrey Hastings; Enlargements, bronze medal, Dr. Smith; tern Slides, silver medal, Mr. Cowling. An interesting item of the ing's programme was the inspection of the Amateur Photographic Loan ection. This collection is a very representative one, and the members reciated the opportunity of inspecting work by so many men, in so many es. Judging from the remarks that were passed, Mr. H. P. Robinson's *olling*, and the pictures that followed it most closely in method of execu- , most generally met with approval.

FORTHCOMING EXHIBITIONS.

1897.

ember 26, 27..... Ashton-under-Lyne Photographic Society. The Secretary, Town Hall, Ashton-under-Lyne.

,, 29, 30..... Durham City Camera Club. R. Hauxwell, The Avenue, Durham.

ember 9–11 ..... Aintree Photographic Society.

,, 28–Jan. 1 . Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough road, S.E.

1898.

uary 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.

,, 29–Feb. 26 . Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.

uary–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.

il 22–30 .... National Photographic and Allied Trades Exhibition A. C. Brookes, Temple House, Temple-avenue, E.C.

27–May 14..... International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

AMSTUTZ' ENGRAVING MACHINE.

To the EDITORS.

GENTLEMEN,—I have read with great interest the description of Mr. stutz' engraving machine, and, although, no doubt, not quite correctly cribed, it sounds well in theory, but the processman and photo- pher need not be afraid of his occupation being gone within a asurable length of time.

For instance, it says in the description, "The cylinder is revolved and cutting tool, which is placed close to it, as it passes over the negative with its *raised* (?) places for the white parts in the picture," &c. ere are the raised places on a negative film?

Further on, the *Cleveland World*, in describing the machine, says, "In ration Mr. Amstutz first produces a photo gelatine sketch (?) or other ef surface of the subject to be reproduced, &c. The recording material nade of a sheet of celluloid or other yielding surface," &c. Question: he celluloid to be used as the printing surface, and if not, where does rapidity come in, in producing a half-tone block. Similar attempts ve been made from time to time, but they won't work in practice. ere is the gelatine relief to be produced, put on to the cylinder, &c., ore the engraving can be commenced. The gelatine relief would dently have to be made from a transparency, if a half-tone block to be produced, if a half-tone block can be made at all from the relief. I am afraid the half-tones will be sadly wanting, and the reproductions will be more after the style of a washed-out gelatine relief. Therefore, cheer up, half-tone workers, and, although Mr. Amstutz expects his machine to come rapidly into popular use (all inventors are sanguine), it won't come just yet.—I am yours, &c.

November 22, 1897. E. FENSKE.

[Those of our readers who are interested in the subject of Mr. Fenske's letter will find Mr. Amstutz' process described by the inventor in the JOURNAL for May 28 last.—ED.]

EXHIBITION RULES.

To the EDITORS.

GENTLEMEN,—As an exhibitor, I wish to call your attention to a very decided violation of the rules and conditions at the recent Hackney Exhibition.

In the conditions printed on the entry form it is specified three times that the work must be that of the *exhibitor alone, and not that of a firm*, in all classes excepting F, which is for portraiture in which "*the work may be that of a firm.*"

In spite of this clearly expressed condition, the first medal in class E (general open class) is awarded to Messrs. Bulbeck & Co., who, I think, were also awarded a medal last year, and whose architectural work has been publicly stated, in THE BRITISH JOURNAL OF PHOTOGRAPHY and elsewhere, to be the work of Mr. J. H. Avery.

It is absolutely impossible to reconcile this with the conditions, and several days ago I called the attention of Mr. Fenton-Jones to it before the work was hung for exhibition; but his reply simply amounts to the opinion that, while the rules certainly specify that firms are not allowed to compete unless the work is the actual production of the exhibitor whose name it bears, yet they may accept work that does not conform to these conditions if they choose.

Nothing could be more unsatisfactory from an exhibitor's point of view than this. If one condition may be broken, why not others? That relating to previous medalling, for instance? There is one fairly well-known exhibitor whom I know to have systematically violated conditions in order to exhibit and compete where his work would not be eligible if the true facts were known, and if secretaries or councils of societies allow rules to be broken in order to obtain work that could not otherwise be included, it is an incentive to those whose work is inadmissible to send it, notwithstanding; but, as an exhibitor, I can fairly contend that the printed conditions should be rigidly adhered to.

I wish to assure you that this is not written in any spirit of animosity or ill feeling against Messrs. Bulbeck & Co. I know both Mr. Bulbeck and Mr. Avery personally, and admire their splendid work as much as any one—more, perhaps, than many—as I recognise the difficulty of producing it, and I certainly have appreciated such work being medalled; but it is simply a protest, irrespective of the personality of the exhibitor, and a protest made before the medals were awarded.

I regret troubling you with such a long letter; but, as you, Sir, are not only Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, but also past President of the Society, I thought that your attention might fairly be called to the matter.—I am, yours, &c., HENRY W. BENNETT.

Hastings House, Norfolk-street, London, W.C., November 17, 1897.

THE SALON.

To the EDITORS.

GENTLEMEN,—"Cosmos" quite misses the drift of my letter, page 687 (October 22), which I thought must have been plain enough. It was not so much a defence of the Salon as an objection to the sneering attitude which "Cosmos" maintains towards that institution. One can appreciate fair criticism—workers may learn something through it—but ridicule only embitters, both life and controversy. In Jottings, page 659 (October 15), there is, no doubt, some just criticism, but, unfortunately, it requires to be separated from the chaff of ridicule and sneer. In Mr. Robinson's Digressions (October 29), expressing, too, much of this just criticism, the element which I fall foul of in Jottings is almost absent. I have closely followed matters during the last eight or nine years, and am not quite ignorant of most of the work worthy of notice. But, where I cannot admire, I trust I do not sneer. I do object to the measuring of the success which the Salon has attained by the criticisms of papers catering for the non-photographic public—just as I ignore the criticism of an ignorant sitter who objects to a "dirty face," as he may be pleased to call delicate half-tone—though this doesn't imply that none of the criticisms in the daily papers are reasonably just.—I am, yours, &c.,

C. H. HEWITT.

Catherine-terrace, Gateshead-on-Tyne, November 19, 1897.

THE COPYRIGHT UNION.

To the EDITORS.

GENTLEMEN,—I would like to draw the attention of your colonial readers to the immense advantages of membership of the Photographic

Copyright Union. I recently found that one of my copyright photographs had been reproduced by a London journal, and immediately wrote particulars of the infringement to the Union, and through its aid I have managed to secure a substantial sum in compensation, which I should certainly have had great difficulty in obtaining had it not been for my membership of the Union. Mr. Henry Gower, the Secretary, of Botolph House, Eastcheap, will gladly send particulars to colonial inquirers.—I am, yours, &c., HORACE W. NICHOLLS.

Pritchard-street, Johannesburg, S.A.R., October 14, 1897.

MR. PACKHAM'S FORTHCOMING DEMONSTRATION.

To the EDITORS.

GENTLEMEN,—Following up the announcement that the members of the Photographic Club will be pleased to welcome members of societies affiliated to the Royal Photographic Society to Mr. Packham's demonstration of the *Gum-bichromate Process*, to take place on December 1, I should like to add that I shall be happy (on receipt of stamped directed envelope) to forward an invitation card to any one taking an interest in the process.—I am, yours, &c., F. A. BRIDGE, *Hon. Secretary.*

East Lodge, Dalston-lane, London, N.E., November 22, 1897.

WHAT THOSE ANTIQUE MARBLES TELL US.

To the EDITORS.

GENTLEMEN,—I often read in photographic journals that art is one thing and photography is another. May I venture a remark without trespassing too much on your valuable paper? Is not all picture-making the artificial handling of nature, whether by the camera or the brush? Where, then, is the distinction between art and photography? The late President of the Royal Academy studied those antique marbles for his pleasure, his profit, and his inspiration. Why do not photographers, as I am afraid many of them do not, sufficiently realise the ideal? I know it is difficult to explain by writing,

"For things seen have more power
Than things heard."

I shall be pleased to make drawings in the presence of photographers, free, to illustrate what I mean.—I am, yours, &c., JOHN BOOL.

86, *Warwick-street, Belgravia, S.W., November* 22, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

F. H. Agnew, 45, Bridge-street, Glasgow.—*Photograph of the Celtic Football Team.*

Mrs. S. Williams, 118, Clowes-street, West Gorton, Manchester.—*Photograph of Charles Williams, Manchester City goal keeper.*

James Paton, 59, Esplanade, Greenock, N.B.—*Two photographs of the Rev. W. H. Addicott, George-square Congregational Church, Greenock.*

P. R. SALMON.—Thanks; the information will, doubtless, be useful.

INCANDESCENT.—Address Messrs. Perken, Son, & Rayment, Hatton-garden, E.C.; or Messrs. Butcher, Blackheath.

TONING SOLUTION.—In the example mentioned, a silver phosphate would possibly be formed, the effervescence being due to the liberation of hydrogen.

OPERATOR.—A hard case, for which it is difficult to suggest a remedy. Your work is very good, and you should find no difficulty in obtaining a more satisfactory position.

H. HANDS.—An article at page 602 of the ALMANAC for 1896 may give you one or two useful hints. As there mentioned, the longest focus lens consistent with rapidity should be used.

W. W.—1. Impossible for us to answer without knowing approximately the quantity of reduced salt to be dissolved out of the prints. 2. Iron left in the print is doubtless the cause. We can only suggest repeated clearing baths as a remedy.

PINT AND POUND.—B. W. A pound of water is seldom given in a formula in this country, but, when it is, sixteen ounces are meant. A pint of water weighs twenty ounces, or a pound and a quarter, and not a pound, as you, apparently, suppose.

DAMAGED NEGATIVE.—J. M. BEAUCHAMP. There is really no mystery whatever about the negative. It has been dried by heat, which has caused the gelatine to run, and thus produced the distortion of the image.

S. MURCH.—1. Against our rules to recommend one manufacturer's goods in preference to another's. 2. Better look through the advertisement pages of the forthcoming ALMANAC, in which several hand cameras to suit your requirements will, doubtless, be found described.

X. Y. Z.—Of course you have no remedy. The fact that you have taken a photograph of a statue with certain decorations upon it does not deprive a brother photographer of the right of availing himself of a like opportunity with the spurious "made-up" element thrown in.

WERNER & SON.—So far as we are aware, there was no business to carry on, the gentleman named not having, to our knowledge, practised photography commercially for some years before his death. Possibly Mr. Van der Weyde, of 182, Regent-street, can give further information.

EIKONOGEN.—A. S. J. If the crystals have become in such a black condition as described, we suspect the eikonogen is of little use as a developer. But why not make up a solution with it, and try the effect on a fully exposed plate? That will be the best way to find if it is of any use or no.

WET COLLODION.—W. BIGGS. Use the formula given on the bottles containing the collodion. Pyro-soda or the ferrous-oxalate developers, as used for dry plates, are of no use in the wet-plate process. By iron developer is meant an acid solution of the protosulphate of iron, and not the ferrous oxalate.

E. A. MCLEAN.—A very simple matter. Place the negative in the slide, the latter in the camera, and draw the shutters. Axially to the camera let a concaved sheet of white cardboard, with, on each side of it, the best source of illumination at your command, be placed, and the optical part of your enlarging system is complete.

LENS.—S. A. We can express no opinion on the quality of the lens from the print sent, as it clearly shows that the camera was moved during the exposure of the picture. Take a negative with the camera fixed on a stand, and either send us that, or a print from it, and then we can judge of the merits of the instrument.

AMMONIA.—C. BUNNING writes: "In most of the formulæ for developers in which ammonia figures no strength is mentioned, and ammonia varies very considerably in strength. Should it be of the strength given in the *Pharmacopœia?*"—When ammonia is given in a formula for a developer, a strength of ·880 is understood, unless otherwise stated.

F. L. S.—We have had no experience of photographing in India. However, there is a book, *A Handbook of Photography for Amateurs in India*, by Mr. George Ewing, which tells you all you desire to know. It is published by Thacker, Spink, & Co., Calcutta; but you can, doubtless, obtain a copy from the London house, W. Thacker & Co. The address we believe, is Newgate-street.

ETHER SATURATORS.—T. A. WILSON. A well-designed and well-constructed ether saturator is perfectly safe in experienced and careful hands. Many accidents, it is true, have happened with them, but they have arisen from carelessness, or from want of knowledge of apparatus or the properties of the material being used. In the hands of a novice an ether saturator may be a source of danger.

SAVING RESIDUES.—AMATEUR (Leeds). The cheapest vessel you can have for saving your wastes in is, we should think, a paraffin-oil cask. It can be purchased for three or four shillings, and contains about four gallons. We may say, however, unless you work on a pretty large scale as an amateur, that you will scarcely find it worth the trouble of saving the washings of gelatine papers at the present low price of silver.

CARBON TRANSPARENCIES.—BUCKS writes: "I have been making some lantern slides by the carbon method, using the special carbon tissue, but many of them have, on the surface, very peculiar markings, which show more by reflected than they do by transmitted light. I have never met with them before on carbon prints."—We fancy we know the marking referred to by our correspondent. If we do, they may be entirely got rid of by coating the transparencies with collodion.

INTENSIFICATION.—A. WRIGHT. Your experiment would tend to show that the trouble arose from the difference in the two makes of hydroquinone; therefore we would suggest that you go back to that you have hitherto used. We ourselves have had no experience with the one you suggest as the source of the trouble. We, however, should be inclined to the opinion that the silver bath was the initial source of the trouble, and that it only became manifest when the image was strongly intensified.

WATER.—H. T. LAWSON. We can only reiterate what we said before, namely that the water contains a large proportion of salts—that is, if the analysis is correct—all "official" analyses are not. We should, as we did last week, suggest that you make comparative experiments by making up the different formulæ with the water from your supply, and with distilled water, and see the result in practical working. That is the only way to arrive at a satisfactory conclusion. If the result with distilled water is better, use that in future, as it is cheap enough.

DRYING CUPBOARD.—B. P. says: "1. I am desirous of knowing what is the best form of drying cupboard or oven for gelatine plates. I do not mean a box such as would be used by an amateur, but the best arrangement to adopt in fitting up a drying room for a large batch of plates. Very probably this is described in some book or periodical, and I have missed seeing it. 2. I think I am right in supposing that there should be a constant renewal of warm dry air, and that the mere heating of the chamber and the air it contains is to be avoided."—In reply: 1. We are unable to recall any work dealing with the construction of drying rooms for commercial purposes. Perhaps some of our readers may be able to give a hint or two on the subject. 2. Yes, we believe so.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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NOTICE OF REMOVAL.

N JANUARY 1, 1898, THE OFFICES OF THE "BRITISH JOURNAL OF PHOTOGRAPHY" WILL BE REMOVED TO No. 24, WELLINGTON-STREET, STRAND, LONDON, W.C.

EX CATHEDRÂ.

E are informed that the prospectus of a company for rking Dr. Selle's process of three-colour photography is in culation, if it has not actually been issued. The capital ked is 50,000*l*. It will be remembered that, at a meeting the Royal Photographic Society, on December 8 last, a per on Selle's process by Dr. Neuhauss was read, and results own. If this is the process that is to be exploited, it may unservedly be characterised as not new. It is known as the ained gelatine process, and is mentioned by Mr. E. Sanger epherd in last week's JOURNAL. On the other hand, we e told that the company intend exploiting three-colour ck work by the ordinary process. A copy of the proectus has reached us as we go to press. We shall refer to in our next.

MANY of our readers will recollect that Mr. E. Cecil Hertslet, an accomplished amateur photographer, and formerly a member of Council of the Royal Photographic Society, was last year appointed to the important position of Her Majesty's Consul at Havre. During his residence there Mr. Hertslet's interest in photography has not diminished, and we are pleased to learn that he has recently taken the highest award at the competition of the Havre Society. This is the first time it has been taken by a foreigner. This Society, we are told by a friend, is a flourishing one—one of the healthiest, in fact, in France, having a membership of nearly five hundred.

* * *

SUPPLEMENTARY to the description given in our number for November 19 of the Eden Studio in Sydney, a new and seemingly sumptuous photographic establishment, we append an advertisement, indicating the manner in which the business is run, taken from a Sydney paper. We are indebted to a friend for the cutting. "The great business of the Eden Photo Studios has been removed to the new building opposite Anthony Hordern's. Persons of the most refined taste may now have no diffidence in coming to our premises, which are undoubtedly and admittedly the most luxurious and best appointed in Australasia. Charming and most elaborate dressing-rooms have been furnished by David Jones & Co., and decorated by Phil. Goatcher, and ladies who require fine work in platinotype can make special appointments by telephone. Our prices will not be raised, and, as an example, the charge for Paris panels is 12*s*. 6*d*. per dozen, while at other places one has to pay 20*s*. Then, again, we do beautiful platinotype portraits at 15*s*. per dozen, which are 25*s*. elsewhere. Then, if you want the dozen cabinets and the opal enlargement, we frame the opal free of charge. And please don't forget to tell the coachman to drive you direct to our new premises, which are opposite Anthony Hordern's, in George-street." Judging by the prices quoted, the element of "cutting" is not unknown in Australian photographic circles. Paris panels at 12*s*. 6*d*. per dozen are cheap.

* * *

SURELY English professional photographers will envy their New York brethren the good times they appear to be having. Mr. Edward L. Wilson, in his magazine, tells us that, according to reports from the trade, the season now opening

promises to fulfil all reasonable expectations. The dealers agree in saying that photographers are placing larger orders, and show an encouraging desire to indulge in new apparatus and conveniences. A good deal of activity may be seen also in the better-class galleries in the pushing of new styles of work. The demand for higher prices is spreading, and the end of another year will, he is confident, find photographers complaining less concerning the remuneration received for the better grades of work. Our inquiries and observations among British professional photographers, especially in London, do not place us in the position of penning such a rosy report as the one we have quoted. We trust that, if any of our younger readers should be induced by the foregoing to contemplate going to New York with the view of taking up photography there, they will assure themselves that they are qualified to hold their own in skill and ability with their American competitors, and that the flourishing state of things described really exists.

* * *

According to *Anthony's Bulletin* an unusual case of poisoning has lately been reported to the Brooklyn Board of Health, the victim being a two-year-old child, who, the week previous to his death, had been discovered with a tintype in his mouth, from which he was actively engaged in extracting its chemical ingredients. Symptoms of poisoning immediately set in, and the trouble was diagnosed as metallic poisoning, "which is thought to have been caused by the mercury and cyanide of potassium with which the tintype was treated."

* * *

It will be seen by our report of the last meeting of the Photographic Club that a very successful exhibition of Messrs. Newman & Guardia's kinematograph was given before a large audience on Wednesday, November 24. Mr. Newman informs us that the machine will shortly be ready for the market. Considerable time and labour have been spent in bringing it to a high degree of perfection. Mr. Newman is of opinion that for scientific-projection purposes the kinematograph is destined to have a prolonged vogue, and he has therefore for some time past been engaged in perfecting the mechanical details of the instrument for which his firm are responsible.

* * *

A circular has been issued to members of the Royal Photographic Society, stating that the membership roll of the Society has been largely increased during 1897. It is, however, very necessary that this sign of health should continue if the usefulness and success of the Society is to be assured, and to that end the Hon. Secretary has sent each member a few copies of a circular having attached to it a form of nomination for membership. It is hoped, he adds, that each member will be able to induce one of his friends to join the Society during the next few months, and thus in this practical manner assist in making the Society a success.

* * *

The Camera Club has, this winter, instituted a series of monthly Club-house dinners, at each of which some distinguished man of science is entertained. Sir William Crookes, F.R.S., will be the guest of the evening at the next dinner, which takes place on December 7. It has probably escaped general observation that Sir William Crookes was a very early worker in photography, and, many years ago, was editor of a photographic newspaper. There is no doubt that under the guidance of its new Honorary Secretary, Mr. J. Wallace Godfrey, the Camera Club is displaying the possession of a fund of vitality such as it has not had for a long time. The meetings are singularly well attended, a fact which excites no surprise when it is seen by our reports that some of the most eminent men of science of the time are induced to address the members, the number of which, we believe, is on the increase.

* * *

Among the most recent recipients of the Queen's Jubilee Medal is Professor Raphael Meldola, who, some years ago, published a work on the Chemistry of Photography—probably the most important contribution to the theory of the subject that has been made. It is to be regretted that Professor Meldola finds little time to devote to the study of photography in its scientific aspects, as, of the men of science who have written and lectured upon it, he has decidedly shown himself the most open-minded and unprejudiced—characteristics that are by no means so common among investigators as could be desired.

URANIUM IN PHOTOGRAPHY.

The history of this metal in connexion with photography furnishes a most apt proof of the oft-quoted saying—"history repeats itself." During the last twelve months much interest has attached to the investigations of the French *savant* M. Le Bon, on the so-called "dark light," an actinic power resident, for a greater or less period of time, in various bodies after being exposed to light, and capable of acting upon photographic light sensitive surfaces in a singular manner, somewhat analogous to that exercised by the Röntgen rays. Various salts of uranium that had been placed in a bright light were found to exert an action capable of producing a developable effect on a dry plate. These invisible radiations, persisted in some instances for months, were arrested by glass, but were able to pass through wood, ebonite, and many other "opaque" substances. The younger generation of photographers would not have recalled to their mind the fact that here was history repeating itself in very truth; but those whose experience dates back nearly half a century ago would well remember some experiments made by M. Niépce St. Victor about forty years ago, that created great excitement at the time, in which among other substances, nitrate of uranium was believed to possess the power of holding "bottled sunshine," as the unknown influence was then called. "When a tube containing a piece of solarised cardboard which has been impregnated with nitrate of uranium is opened in the dark and a piece of paper coated with nitrate of silver is placed upon it, at the expiration of a couple of hours a very sensible reduction is produced in the portion corresponding with the opening of the tube. . . . . If the temperature is about 176° Fahr., it is effected in about ten or twelve minutes." This extract, taken from one of the early numbers of this Journal—nearly forty years ago—might have been written as many weeks since if for Niépce St. Victor we substitute Le Bon, and for silvered paper dry plates. It is not our purpose now to enter into the details of the discussion consequent upon the publication of M. Niépce's researches. It appeared to be conclusively shown by other experimenters that a chemical emanation, and not "bottled sunlight," was the cause of the action; but the impermeability of glass to X rays was no

known at that time, and we may recall the fact that one of the experiments brought in disproof of the "bottled sunlight" theory was that in which the silver paper was partly covered over with a slip of glass. No action took place under the glass, while the uncovered portions discoloured as described. We need scarcely say that, in the light of latter-day knowledge, such an argument would be valueless, if indeed it did not count in favour of the idea in view of Röntgen ray analogies.

For a few years men's thoughts were turned away from nitrate of uranium till again they were directed upon it by the fierce discussion that centered on what then promised to be almost a revolution in photographic printing methods—the introduction of the famous (patent) "Wothlytype process." This process, though it quickly became extinct, had a popular vogue, many professional photographers taking it up and advertising it, some Wothlytypes, to our knowledge, containing as much uranium as many platinotypes at present sent out contain platinum. The patent process consisted essentially of a method of giving a matt, or dead, surface to the paper, and then coating it with a collodion sensitised with about twenty per cent. of nitrate of uranium, and about one per cent. of nitrate of silver. The general effect of the prints, with their matt surface, so great a contrast to the glossy albumen, then almost universal, was effective; and, just as the matt prints in platinotype or otherwise of the present day appeal to cultivated tastes, so did the Wothlytypes become popular from similar causes. But the patent was shown to be worthless, through long previous publication of a similar mode of printing: the prints did not come up to expectation; they were also found to be fugitive. Uranium was dead again.

The metal, as far as photography is concerned, now experiences a long rest; but, at last, it is once more brought into requisition, and, under Mr. Weir Brown's able treatment, photographers were shown what beautiful results could be brought about by its use as a toning agent. Uranium-toned pictures were very beautiful; but, alas! even a comparatively brief wash under a stream of running water sufficed to dissolve the tone away, and, if the washing was reduced to a minimum, the traditional fugacity of the material was too prone to manifest itself in the prints it had beautified. Once more uranium was virtually dead. And so it remained till M. Le Bon's advent.

At the present time, too, some attention is given to it in connexion with lantern slides. But we feel that the interesting metal has never had a fair chance. We believe it to possess potentialities of good that may yet be engineered into popularity. The field wherein the greatest possibilities for success would appear to be is in its use as a merely temporary or adventitious aid to the production of a print. The platinotype process shows us what iron can do in that direction, and there seems to be no *à priori* reasons why a somewhat similar *rôle* should not be played by the subject of our article—uranium.

Photographs Wanted.—We have received at our private house a circular from Harmsworth Brothers, Limited, and, doubtless, many of our readers have done the same, inviting us to contribute to a collection of photographs they are making of curious or remarkable subjects with the view to the reproduction of those selected. Many of such invitations are issued with the idea of getting the photographs from amateurs for nothing beyond the question of honour of their being reproduced in some publication or other. In the circular before us this is not the case, as there is a sound business line in it: "State also your terms for the right to reproduce the photographs." We hope those amateurs who may send in pictures will not put a price upon their reproduction *below* the minimum—half a guinea—fixed upon by the Photographers' Copyright Union, to which many amateurs now belong. If a photograph is worth reproduction in any publication, it is worth being paid for, and this is what Messrs. Harmsworth are prepared to do. As to the character of photograph desired, Messrs. Harmsworth, in their circular, say, "Photographs of objects without something unusual or out of the way about them are of no use to us." As an intimation as to what is wanted, the circular contains a list of suggested subjects, amongst which we cull the following, as they give a general idea of the whole: curious churches, or parts of churches, churches which have been put to curious uses, queer trees, or natural objects, queer country customs, strange ceremonies, remarkable monuments in and out of churches, curious sights in the country, fads of eccentric people, &c. With regard to the last-quoted subject, a somewhat cynical friend, on reading it, remarked, that he thought that a sharp photograph of the interior of the Dudley Gallery, during the late and previous shows of the Salon would certainty meet with acceptance, and command a fair price. We quote the opinion as given by our friend.

Lens Flanges.—Few there are who have not experienced the trouble involved in changing a lens from one camera to another when the flange has to be taken off the one and put upon the other. Generally some fresh holes for the screws have to be bored—some old fronts are literally riddled with screw holes—or perhaps the aperture in the camera front is either a little too large or a little too small to take the lens mount. This trouble has to an extent been met by the introduction of "standard flanges," but they do not, unfortunately, fit. Amongst the objects of interest shown at the Photographic Club the other night was a lens mount of ancient date, in which these difficulties were met. We saw it when at the Crystal Palace some time ago, and were surprised that so simple a contrivance was not in more general use. It is this:—

The flange, which is somewhat broader than usual, has no screw holes in it, and is fixed permanently on the mount. The thread of the screw on the mount is continued sufficiently long to pass through the camera front and a little beyond. On this another flange screws on from the inside of the camera as a nut, and holds the lens securely. All one has to do is to unscrew that, and the lens is detached at once. The advantages of this system are that no screw holes in the camera are necessary; the size of the aperture in the front, within reasonable limits, according to the width of the flanges, is of no importance; and the rapidity with which the lens can be removed from one camera and replaced on another. We were told that the late Mr. Thomas Ross mounted several of his early lenses in this manner. It is a little surprising that this system fell into desuetude, seeing its great convenience. Probably it may, at some future time, as other good things have been, be reinvented, and, possibly, patented.

Andrée's Balloon Expedition.—The steamer *Victoria*, with the expedition in search of Andrée, which went to Spitzbergen, has returned without finding any trace of the explorer or his balloon. The rescue party landed ten or a dozen times on the coast of Dawmands Islands, but without result, although rockets and all kinds of signals were sent up, and Bengal lights were used all night, as well as the *Victoria's* syren being freely used from time to time. It will be remembered that this search expedition was started by the Norwegian Government, because it was alleged that voices were heard on the island by those on board a passing vessel. While in Ice Fjord it appears that the *Victoria* got temporarily ice-bound, but fortunately got free. If Andrée and his *confrères* are safe, there is now little prospect of their being heard of for some months to come.

Peterborough Cathedral.—One evening last week Mr. Arnold Mitchell lectured at the London Institution on *Peterborough Cathedral*, about the restoration of which there was such a stir

amongst archæologists and others some time back. The lecturer showed, by means of photographs projected upon the screen, the present state of the building, and the state of decay some parts of it were in. It appears that in the restoration of that front, about which there was such an outcry, 2000 stones were taken down from one of the gables and carefully numbered. Out of this number 170 were found to be too decayed to be replaced, but all the others were put back in exactly the same places they occupied before. Other portions of the cathedral, it appears, are sadly in want of repair, and need to be taken in hand at once. As the Dean and Chapter, on the advice of their experts, have done the needful so well with a portion, it is to be hoped they will do the same with others in due course, so that this fine building be saved from ruin. Archæologists and the like may revel in crumbling walls, but the majority of people would like to have our ancient buildings in fair repair—that is, if the repairs, when necessary, do not interfere with the original design.

The Approaching Eclipse.—At the last meeting of the British Astronomical Association Mr. Maunder stated the arrangements made, more particularly on the part of the Association, for taking observations, photographic and otherwise, in India of the solar eclipse which takes place on January 22 next. It appears that, owing to the spread of plague around Poona, they had considered it advisable to recast their plans, and not take a mixed party there. It is now arranged that some of them would start next week by a P. and O. steamer to Nagpore, and make arrangements for camping out on the central line. The second party will start a fortnight later to Allahabad and Benares. The Government party is to be divided into several small sections. The one from South Kensington will be under Sir Norman Lockyer, and will go by Ceylon, and thence by one of H.M.'s gunboats to Viziadrug. The observers from Madras are expected to take their posts at Karad, and probably those from the Royal College of Science at Poona will be there as well. Those from the Royal Astronomical Society will be located in the Nagpore district, near the first-named Society, while the Astronomer Royal and his party are expected to proceed to Shagpur *viâ* Jubblepur, and the Astronomer Royal for Scotland will go to Seone *viâ* Nagpore. Altogether there will be about half-dozen observing parties, and, with their equipments, they should be able to secure most valuable results; that is, if weather permits. It will be remembered that, although most elaborate preparations were made in Norway and Japan for the last eclipse, the object was defeated by the weather. It is to be hoped that it will be more propitious for photography, and general observations, on the 22nd of January next, in India.

DIGRESSIONS.

XXIV.—Judging, Wholesale and for Exportation.

When that New Zealander of the future, of whom we have heard and hear so much, comes, not to sit down on London Bridge and lazily look around, but to dig up England and discover our manners and customs, learn what we had for dinner, what kind of God men made in their own image, and secure prehistoric samples of soap and pills, what will be his chief find? He will come upon what he will undoubtedly term photographic middens—great pits or heaps of broken glass, perfect pieces of which showed that they consisted of little squares, on which some *savants* will think they recognise certain forms and resemblances to natural objects; this will be denied by others; still others will think they had some analogy to the sculptures on ivory and bone of a still earlier period. These pieces of glass will be found difficult to extract from the heap, for they will be cemented together by the aid of time and pressure with a curious substance then unknown, but which we now recognise as celluloid film. In those days buried Kodaks, not entirely in working order, will be as plentiful as quaternary arrow heads and Celts are now. This estimate is based on good evidence. When we see as many as 25,000 photographic prints from films, good enough to send to an exhibition, we may be sure that plenty of materials for many heartrending film funerals have accumulated, not to mention the glass that is continually passing through cameras. It has not yet been calculated how many spoilt prepared surfaces it takes to produce one exhibition picture; but, when you begin to go into the question, you find that the horse-shoe-and-nails problem is nothing to it, and you open up a world of figures that could only be calculated by Alfragan the Arabian, Jedediah Buxton, or a machine which would probably soon get out of order from overwork.

Five-and-twenty thousand photographs all in a row! No less. It puts one in mind of fairy tales and magic and mystery, of a world full of events not founded on fact, and only to be understood by the imagination of the very young or delightfully old.

There used to be books on popular astronomy that told how many shillings it would take, laid edge to edge, to measure to the moon. Here we have the material for a new metric system, and plenty of it. How many diameters of Kodak films would it take to get near enough to the sun to find out how actinism is made? But here it seems to me I am giving way to ideas about which there is no solution, and won't develop when there is, while, what all photographers dearly love, something practical is to be done. These 25,000 photographs have to be judged, lantern slides and all, by three ordinary mortals in a few hours! Prodigious! And it was done, but not in an inappreciable space of time, as predicted.

All these profound thoughts are, of course, inspired by recollections of the Eastman Exhibition that took place last month at the New Gallery, Regent-street, and, having astonished us here, is now on its way to America to compete with Niagara.

How the judging was done seems to have been an object of curiosity, and has puzzled so many people, that I think, as I happened to be one of the Judges, it may be interesting if I threw some light on the matter, if indeed etiquette and propriety will permit of some revelations of the inner mysteries of the judgment-seat.

In the beginning a circular was sent to the amateurs of the world as far as they could be reached, and the Eastman Company is far-reaching, offering prizes to the amount of 600*l.* for photographs, the chief condition governing the competition being that the negatives must be made with a Kodak on Eastman's transparent film. The method of printing, enlarging, &c., was left open to the choice of the photographer. The framing was done by the promoters. The ruling spirit, or the wizard who worked the magic, was Mr. George Davison, whom we all know, aided, no doubt, by efficient helpers, and that "backing" without which an affair of the kind would be quite impossible; but it should be recorded that he was the one who waved the wand and uttered the words of might. He had also the advantage of Mr. Walton's very efficient aid in the decorations. Mr. Walton this time achieved a masterpiece, having recently learned what not to do from the decoration of the Salon.

I am not sure that such a boom as happened was expected, but I do know that, when I heard that "over 25,000" had been sent in, I wondered why I had been such an idiot as to promise to be one of the jury, for here appeared to be work for the rest of the natural lives of all available Judges.

But it was not so bad, after all. There was a useful condition to the effect that there was no undertaking to hang every exhibit sent in. It is well known that to every exhibition there is sent a vast quantity of prints that do not require very expert Judges to recognise as having no chance of being in the running. The three Judges therefore were relieved of some thousands of these; the rest were hung on the walls of the great North Gallery.* Then happened what would have been unfortunate if it had not been admirably remedied by the waving of the wand, the words of might—and a hansom! At almost the last moment it was found that the President of the Paris Photographic Club, who had been advertised for months to form one of the jury, was not able to be present; but the good fortune that has followed this venture throughout enabled the manager to secure the valuable services of Mr. G. A. Storey,

* Their consciences struck the Judges endways afterwards. However skilful were the assistant Judges they had appointed, and they were of the best, they felt it was their duty to see every picture themselves. This was accomplished without making any difference in the result.

A.R.A., who has much knowledge, no prejudices, and is renowned for his fairness and willingness to oblige in all good work connected with art.

Now, how was it done? I will take Class A (Snap-shots, Contact Prints), for example. There was over 100*l.* offered to this class, divided into twenty five prizes, varying from thirty guineas to one guinea, and there were about 1500 competing prints. Each Judge began by taking several glances round to get some general knowledge of the exhibits. Each then made his own list of what he considered the best twenty-five prints, regardless, for the present, of individual value. Looking at the apparent evenness of the collection as a whole, this seemed a hopeless task, but it is surprising how these separate lists were found to contain nearly the same numbers, showing much evenness of opinion. But there were some discrepancies. The Judges then went over the selected examples together, talked over each picture, and adjusted their differences. They had now got a list of the twenty-five numbers which were to have the twenty-five prizes, but these had yet to be arranged according to their quality. First of all, it was decided to select the three best in order of excellence. When this was done, we had secured the thirty, twenty, and ten-guinea prizes. The following six prizes were for five guineas each. These were selected in the same way, and added to the list. Here were nine prizes settled; the remainder looked as though there was not the toss of the proverbial button between them, so we said, Let us take the five worst, and satisfy the last single-guinea prizes. There was now left eleven prizes, three of 1*l.* 13*s.* each, which were soon provided for, leaving eight, varying from three guineas to 2*l.* 10*s.*, and I must confess that these were distributed to the remaining eight pictures without much affectation of distinguishing the niceties of quality.

Now occurred a curious difficulty which we scarcely thought about before. We had arranged to have the exhibitors' names if we required them, for I for one will not judge an anonymous exhibition; but we had gone on without requiring names, and this fix happened. The conditions stated that no competitor should receive more than one prize in one class. Having treated the prints anonymously, how did we know we had not given all the prizes to one person, or, let us say, some smaller catastrophe than that? Therefore we called for the names of the winners, and found we had made a bad start. We had awarded the thirty-guinea and twenty-guinea prizes to the same exhibitor! This was satisfactory in one way, for it showed that we had spotted great merit twice over; but we ought to have known better, as some of the same features occurred in each print. Prize No. 2 had to be eliminated, and the rest pushed up one, as at the tea party in *Alice in Wonderland*, and, to be quite fair, we had to decide which of the six five-guinea prints should become prize No. 3. We had avoided the pitfall, and recognised individuality in the rest of the class, except in one case, and that was low down on the list, and was easily adjusted. Here we had actually given five prizes to one exhibitor, but the styles of the five photographs were so various that it was impossible to distinguish the hand of the photographer. Individuality is a plant of slow growth, and only blossoms when maturity is approaching. This was the end of Class A.

Now the shades of evening were falling fast. We had been working like three windmills in a gale for six hours. We were tired, and adjourned.

After a befitting interval, most solemnly and usefully employed to the music of a band, we met again to judge the lantern slides, but not with much success. The lantern had compassion on us, and with a wink went wrong, so that we may conscientiously leave the work for the day.

We met again next morning. Our work was easier—we knew it better, and the classes were smaller. One curious effect happened. The separate examination of so many Pocket Kodak prints drove us, not exactly mad, but certainly into a state of "fidgets." A dose of lantern slides put us right, and the work was done. It may be interesting to mention that, during the examination of these little prints, we found it absolutely necessary to comfort and refresh the eye with visits to the wonderful enlargements on royal bromide paper in the Invitation Gallery—perhaps the best, and certainly the most surprising, roomful of pictorial photographs ever got together. Those who lent negatives were even more surprised than others at the pictures their negatives had yielded. This paper will be discovered by the professional in time as well as the amateur.

When we departed, the other galleries were in a state of chaos. Mr. Davison was in seven places at once; the Master of the Decorations would not even admit that any colour had a name, but the effects he was producing with nameless colours were as satisfying and charming as though they had been christened out of the Oxford dictionary.

Order reigned on the following Monday morning, and the Press view began. This is another sacred mystery, which it would be as much as my life is worth to describe. H. P. Robinson.

ON THE INFLUENCE OF DIFFERENT ACIDS AND CHLORIDES ON COLLODIO-CHLORIDE PRINTS.

The addition of acids to collodio-chloride of silver emulsions has, as is well known, a double purpose—namely, to give the pictures more vigour and brilliancy and, on the other hand, the paper will keep longer.

Doubtless, the acid exerts a certain action on the paper and on the image. This is an admitted fact, and therefore it may not be impossible, by the addition of certain acids, to obtain certain effects. If the formulæ for collodio-chloride emulsions are compared, it will be found that, generally, citric acid is used. For instance, in twelve formulæ, compared by Valenta, all but one contained citric acid; in this one it was replaced by tartaric acid. So far as I can find out by a study of the literature of the subject, no other acids have been used; and it was only natural that these acids, especially citric acid, should be used, because they had been tested with albumen paper.

In order to make comparative tests, it was first essential to establish a normal emulsion. Of the chlorides, lithium chloride seemed to be the most suitable, as it is readily soluble in alcohol, and does not separate out when added to the collodion. The proportions between the silver chloride and acid were so chosen that a little more than half the silver nitrate was converted into chloride, whilst the citric acid was just enough to convert the rest of the nitrate into silver citrate. The formula for the emulsion was as follows:—

Celloidine collodion four per cent.	50 c. c.
Lithium chloride	0·4 gramme.
Alcohol	10 c. c.
Citric acid	0·4 gramme.
Silver nitrate	2·12 ,,
Water	1·5 c. c.
Alcohol	15 ,,
Ether	25 ,,

By earlier experiments it was proved that the precipitation of a concentrated collodio-chloride of silver emulsion, which contained no excess of silver, by pouring into water, and after drying, and again dissolving, and subsequent addition of acid and the rest of the silver, gave considerable difference in results between the washed and the unwashed emulsion. This process was used in subsequent experiments, and the following concentrated emulsion was used:—

Celloidine collodion, four per cent.	500 c. c.
Lithium chloride, dissolved in alcohol	4 grammes.

To this mixture 11·2 grammes of silver nitrate, dissolved by heat in a little water and alcohol, were added by degrees, If this emulsion be poured in a thin stream into water, with constant stirring, the collodion separates as a stringy mass, which can be washed by frequent shaking and decantation with water, and then dried by exposure on blotting paper. All the operations must, of course, be done in subdued light. The weight of the dry emulsion was about 30 grammes, and of this 3 grammes were dissolved in 50 c. c. of ether and 20 c. c. of alcohol and 0·4 gramme of citric acid and 1 0 grammes of silver nitrate dissolved in alcohol added, and the resulting emulsion agreed in behaviour with the normal emulsion, the only difference being, of course, the absence of the lithium nitrate, which was removed by the washing.

In order to make the comparative test, three grammes of the above dry emulsion were dissolved, as stated above, and, in place of the citric acid, the acid to be tested was added in quantity equivalent to the 1·0

grammes of free silver nitrate. To the finished emulsion ten drops of glycerine were added to make toning easier. In this way the inorganic acids—nitric, boric, sulphuric, chromic, and phosphoric—were tried. The halogen acids could not obviously be tested in this way.

For toning the prints, which were printed in the usual, Kurz's separate and Gaedicke's combined toning and fixing baths were tried, as well as the following platinum bath:—

Chloro-platinite of potassium	0·3	gramme.
Phosphoric acid	6	c. c.
Water	100	,,

The prints were first washed and then placed in the toning bath, the platinum bath being warmed to 65° to 70°, and they were then fixed in solution of hypo, being previously washed for some minutes in running water.

Very slight difference could be noticed in the colour of the sensitive film when using these acids, though with phosphoric acid it was yellowish, printed the quickest, and with a blue-black colour.

When the prepared, but unprinted, papers were grouped according to their keeping power, *i.e.*, as to their power of keeping white longest, the order was as follows: Phosphoric, hydrochloric, normal emulsion, sulphuric, boric, and nitric. The chromic acid was also tried, and, although the paper was exposed for hours, no trace of an image could be obtained.

Of the organic acids the following were tried: Formic, acetic, oxalic, lactic, gallic, tannic, benzoic, picric, and salicylic. Formic acid soon produced a brown discoloration of the emulsion, and, after some time, a visible reduction of the silver took place. With gallic acid the emulsion was immediately reduced, and the same occurred, though after a longer time, with tannic acid. Of the other acids, the acetic toned the worst, whilst tartaric gave the best results. Picric acid gave a very insensitive emulsion, which had to be printed in the sun. The order of keeping was: Salicylic, tartaric, oxalic, benzoic, picric, acetic, and lactic.

It had now to be proved whether, as previously mentioned, a washed emulsion showed different qualities to an unwashed.

Generally, and especially when citric acid was used, there was no difference. Any differences which were noticed might be ascribed to an emulsion which was not perfectly dry. From a theoretical standpoint, the presence of a nitrogenous substance—in our case, lithium nitrate—is hardly advantageous to the keeping property of the paper. On the other hand, it is often thought that prints on an unwashed emulsion have more vigour than on a washed one, but this disappears in toning and fixing, and the final result is the same, assuming, of course, that in each case a perfectly dry emulsion is used.

Apart from the small variation in colour, the acids have practically no influence on the character of the image, but it is obvious from the experiments that the addition of certain acids is not only not required, but that they are actually prejudicial, and this is especially the case with acetic acid, and paper prepared therewith becomes a deep red after about eight or ten days, and it is almost impossible to tone it.

The question may arise as to whether the action of acids may not appear in another way, namely, by the use of acid or the corresponding silver salt in place of silver chloride. But a striking difference can hardly appear then. It will be seen that in the above emulsion there is about 1 gramme of silver nitrate which can be converted by the acid. Further experiments in this direction will be carried out.

Since the acid did not produce marked differences in the prints, tests were made to determine whether different chlorides had any such property. In many test books it is stated that the chlorides have considerable influence on the results, and my experiments will only uphold this statement in so far that the differences are certainly more noticeable than with the acids.

The equivalent quantities of the chlorides were added to the normal mulsion, and the following were tried: Calcium, strontium, magnesium, cobalt, nickel, uranium, zinc (ic and ous), and ammonium. The colours of the emulsion were very striking. The cobalt was, before the addition of the silver, a blue, afterwards a beautiful rose; nickel was greenish, and uranium yellow. Zinc chloride (ous), as was to be expected, immediately reduced the emulsion. Uranium had the peculiar property of giving to the emulsion a glaze like albumen paper. In printing and toning the zinc emulsion left much to be desired. The cobalt emulsion, on the other hand, gave vigorous prints, which only altered slightly in the subsequent toning and fixing. Obviously the coloured emulsions, such as cobalt, lost their colour in toning and fixing.

As regards the keeping power of the paper, the order was: Magnesium, nickel, ammonium, zinc, uranium, strontium, cobalt, and calcium.

DR. KNAUER.

A NEW BASIS FOR PHOTO-MECHANICAL PROCESSES.

[Translated from the Photographisches Archiv.]

A PRINT is made in the usual manner upon gelatino-bromide paper; that is to say, the paper is exposed under a negative, developed with hydroquinone, fixed, and thoroughly washed. The print when finished is brushed over with a concentrated aqueous solution of persulphate of ammonium. The image bleaches in about a quarter of an hour. If we now remove from the surface the solution we have used by rinsing the print in cold water, and rub the wet film, the natural heat of the hand will dissolve those parts which were previously reduced by the developer. The white portions of the film, which had not been exposed to light will remain unchanged.

A gelatine relief is thus obtained. Where the film was darkest, the paper is laid quite bare. About half the gelatine remains in the half-tones, whilst the film is thickest in the high lights.

If the gelatino-bromide of silver is not too sparingly coated, the relief, whilst still wet, is nearly as strong as shown in a freshly developed carbon print. After drying it may still be recognised with ease. To render it still more visible, the gelatine may be stained with an aqueous solution of methyl-violet. A perfect negative may be thus produced, as the thicker portions of the film absorb more dye than the thinner.

Reliefs produced in this way should be of use in various photo-mechanical processes, as we shall show later on.

The same process may be applied to negatives taken on bromide plates, but the relief is not always so perceptible upon the ordinary rapid plates of commerce as on the less sensitive bromide paper. I have consequently taken the latter for the illustration of my point, and I would recommend others to use bromide paper also for their first experiments.

For the production of these reliefs the negatives should not be developed with pyrogallic acid. I have already shown that a product of oxidation from the pyrogallic acid may be retained with the silver in the film, and renders it less soluble.* This tannin action would, of course, counteract the subsequent process, consequently it is necessary to develop with a stainless developer, as, for instance, hydroquinone or para-amidophenol. It is also necessary that the negatives should not be intensified with mercury, as this has a very strong tanning action.

Negatives bleached with persulphate of ammonium, and then, like carbon prints, developed in warm water by rubbing away the exposed portions of the film, may be converted directly into positives by staining with a dye. If the plate has not been over-exposed and over-developed, a stained transparency is obtained that may be used in the lantern, or for window decoration.

The same results are obtainable with prints upon gelatino-chloride paper. It is immaterial whether the image is fully or only partially printed and then developed with an acid developer. The prints may be toned or untoned. The combined toning and fixing bath also has no injurious effect, although the film may be tanned by the alum present.

In all these experiments it may be seen that the metallic silver forming the half-tones is only at the surface of the film. It extends to the glass or paper only in the darkest portions.† In the case of gelatine prints, the paper is laid bare only in the deepest shadows. These results confirm my theory of the structure of the negative, which has only been based hitherto upon microscopic observations and experiments made by paring the films. ‡ In searching for the causes of these phenomena it was found that persulphate of ammonium (or potassium) not only bleaches the metallic silver, that is to say, converts it to a colourless salt, *but that the saturated solutions also have an appreciable solvent action upon the metallic silver.*§

The production of the relief may be due either to further tanning of the film or to increased solubility of the parts where silver had been reduced. I have been able to determine that the latter is the case. A finished gelatine print was half brushed over with persulphate of ammonium. After rubbing it in warm water, the image was still perfect on the half that had not been brushed over. On the side that had been brushed those parts were dissolved where the silver had been reduced, whilst the portions where silver had not been reduced remained unaffected. *Those portions of the gelatine film in which the metallic silver is*

* *Photographisches Archiv*, 1896, pp. 168, 174.

† In the case of thin films, such as many of the celluloid films of commerce, the relief can, of course, only be slight, consequently the image formed upon them has not much depth.

‡ See *Photographisches Archiv*, 1897, p. 113.

§ It, therefore, seems not without danger to use these salts for the elimination of hypo from prints. There is also the fact that the persulphates, in decomposing the hypo, precipitate sulphur.

embedded consequently become more soluble, when treated with persulphate salts than those parts which are free from silver.

Only two alternatives are possible: First, that the gelatine is affected in the exposed portions prior to the experiment, so that the persulphate salt has a different action upon it in comparison with ordinary gelatine; or, second, that the entire change in the gelatine first happens when the persulphate salt acts upon the silver contained in the film.

The first alternative must not be rejected immediately, as many photographic chemists hold that the gelatine absorbs bromine from the exposed bromide of silver, since it acts as a sensitiser.*

I thought I could decide this question by converting into bromide of silver, with bromide of copper, half of a gelatine print, and then removing the bromide of silver with hyposulphite of soda. After treating the whole picture with persulphate of ammonium, a reversed relief was produced on the half from which the silver had been removed, when the print was rubbed in tepid water. The previously dark parts were left, and the lights were dissolved. The same happened with a bromide print. A tanning action might be ascribed to the bromide of copper for those portions of the film containing the silver. In that case, however, a mixture of the copper salt and the persulphate of ammonium must be less active than the latter alone. Actually, this was not the case. One must therefore conclude *that the solubility of the gelatine, where the silver is present, is a secondary process due to the reaction of the persulphate salts upon the metallic silver.* †

A further proof of the close connexion between the alteration of the gelatine and the bleaching of the silver lies in the fact, that when the action of the persulphate salt has been too short, the deepest shadows (still retaining their colour) remain unchanged in tepid water, whilst the half-tones dissolve.

Concerning the use of this process for photo-mechanical purposes, it must be remembered that the relief is reversed, as in the processes at present employed. Bichromated gelatine becomes insoluble where it has been exposed to light. It must therefore be exposed under a negative for process work, collotype, and the carbon process. The same is necessary in Warnerke's process, which has for basis the retention of the oxidised product of the pyrogallol at those portions of the gelatine film retaining the silver, and there tanning it. In the course of my experiments I hit upon some other methods of producing a relief from a silver print on gelatine. Hitherto they have all proceeded from the solubility of the unexposed parts, thus leaving the exposed portions intact. For instance, if a finished gelatino-bromide print is treated with a concentrated solution of bichromate of ammonium, the unexposed portions will swell and become soluble in warm water, whilst the parts containing the silver will remain unchanged. I will not refer at greater length to this, because the process does not seem to offer any particular advantages in comparison with Warnerke's. As an analogue to the process with persulphate salts, the behaviour of ferric chloride and gelatine can alone be instanced. Ferric chloride has a very strong tanning action upon gelatine. Upon exposure to light, ferrous chloride is formed, which renders the gelatine soluble.

To obtain by my method a suitable relief for photo-mechanical etching, a print must be made under a transparency, or the image may be obtained direct in the camera upon the film, which is to be subsequently used as the etching ground. I coated some copper plates with gelatino-bromide emulsion. The emulsion was not of the highly sensitive kind required for instantaneous plates, but of medium rapidity, as used upon photo-mechanical plates. For photo-mechanical purposes it is necessary that there should be great opacity of image as well as absolute freedom from fog. (It is extraordinary how well the emulsion keeps upon a copper support. Plates that have been kept some weeks are not yet spoilt.)‡ Such a plate was exposed behind a screen in the camera.§ Upon development in normal hydroquinone developer, a vigorous image was produced, without the least trace of fog. The fixing also began normally; but the destructibility of the copper soon made itself apparent. The copper decomposed the silver salt liberated by the hyposulphite of soda, and was soon coated with a thin film of metallic silver, not only upon the back, but also between the plate and the film, and partially within the latter also. Not only does the image thus become strongly veiled with red fog, but the film is rendered quite unfit for the production of a relief, as those portions where the silver is deposited behave precisely the same as the exposed portions.

I endeavoured to remedy this fault by using the persulphate of ammonium before fixing; but it was impossible to produce a relief in that way.

A few copper plates were first covered with a thin film of silver on both sides, and then coated with emulsion. The difficulty of fixing was thus overcome. I was of opinion that the etching could not be impeded by the silver, since persulphate of ammonium is a solvent of silver. The etching would thus be initiated by the same means which had produced the gelatine relief. It also appeared possible to complete the etching with the persulphate of ammonium, as it is also a solvent of metallic copper. But these experiments failed also. The under surface of the gelatine film became soluble, through the action of the persulphate salt upon the silver support, which was in immediate contact with the former. The image no longer adhered sufficiently. Silvering the copper plate, therefore, is not a solution of the problem. The relief might be prepared upon a temporary support, and then transferred to the copper plate. But I consider the direct exposure, upon the plate used for etching, of far more value in practice, and shall now continue my experiments upon these lines.

Perhaps preparatory treatment of the plate with a thin film of resin may be of service, the same to be removed from the exposed parts by means of ether, prior to etching.

I will leave for the present the application of the process to other purposes, such as collotype, the etching of glass, the production of coloured transparencies in the camera, &c., as I have not yet concluded my experiments in these directions. R. Ed. Liesegang.

* According to the statements of Knopp, the bronzed gelatine, without further treatment, is far less soluble than the unexposed. (See *Photographisches Archiv*, 1894, p. 66.)

† I express myself thus cautiously, because a prepared solution of silver in persulphate of ammonium has no solvent action upon gelatine.

‡ According to statements made not long ago by Russel, this was certainly not to be expected. (See *Photographisches Archiv*, 1887, p. 140.)

§ The picture is thus obtained in the correct position at once for printing—right to left upon the plate.

FOREIGN NEWS AND NOTES.

Improvements in Artificial Light.—Two articles in *Die Photographie* deserve to be noted by the professional photographer. The first describes an invention known as Rothgiesser's hydro-press gas light. Ordinary coal gas is compressed by a supply of water, and mixed with air in passing through a series of sieves. These are arranged in such a manner that the light cannot flash back. The water used for compression of the gas passes through the apparatus uncontaminated, and may afterwards be used for any photographic purpose. A light of 600 candle power may be had with a consumption of rather more than fourteen feet of gas per hour, and about twenty to sixty gallons of water, according to pressure. The apparatus is manufactured in Nuremberg. The second article refers to an Italian invention for the improvement of the acetylene light. It consists of a mixture called Eureka, which is composed of 900 parts of unslaked lime, 50 parts of resin, and 50 parts of calcium carbide. Probably grammes are intended. One thousand parts yield 60 litres of gas under a pressure of 25 mm. of water. The photometric intensity of the flame was found to be 92·4 candles, whilst the same quantity of calcium carbide, used alone, gave only 18 candles. These figures are taken from the results of Italian experiments, and, until some account of practical experience with the light is forthcoming, the editor of *Die Photographie* is inclined to doubt if such favourable results are possible.

The Intensification of Platinotypes.—Raimund Rapp gives the following method in the *Wiener Photographische Blätter*: A cold saturated solution of gallic acid and a ten per cent. solution of nitrate of silver are prepared. Immediately before use make a bath composed of—

Gallic acid solution	50 c. c.
Nitrate of silver solution	2 „
Water	50 „
Glacial acetic acid	10 drops.

Well soak the prints in water before immersion in the above. The deposit on the print will be exceedingly fine in grain, and, when sufficient intensity is attained, the prints should be passed through three or four baths of water, to which a little glacial acetic acid has been added. The silver may be replaced by platinum if the prints are toned with the following bath:—

Potassium chloro-platinite	1 gramme.
Phosphoric acid	15 c. c.
Water	600 „

The prints should remain in the bath until quite black by transmitted light. They should then be washed for half an hour.

The Stereoscope in the Sixteenth Century.—It would appear, from the *Revue Suisse de Photographie*, that something was known of the stereoscope in the Middle Ages. In the Wicar Museum at Lille there are two pen-and-ink drawings (Nos. 215 and 216) representing a young man sitting on a bench and using a pair of compasses. They are by Jacopo Chimenti, a painter of the Florentine School, who was born at Empoli in 1554, and died at Florence in 1640. These pictures are drawn from two different station points to the right and left. They are of identical size, and can be combined stereoscopically. One is, therefore, entitled to infer that they were drawn for such a purpose. According to old documents, there are indications that Gallienus, prior to 1500, and Baptiste Porta, in 1593, had described the principle of the stereoscope, and that the latter had made complete drawings of the different pictures seen by each eye, and the combined picture as seen by both together. From these drawings, not only the principle, but also the construction, of the stereoscope may be recognised.

Protalbin Paper.—We have recently referred to this new invention of Dr. Jolles, Lilienfeld & Co., in which the printing surface is composed of vegetable albumen, instead of collodion, gelatine, egg albumen, &c. Dr. Eder reports very favourably upon it in the *Photographische Correspondenz*. Combined with sufficient elasticity, the new material is superior to collodion in hardness of surface, and it equals ordinary albumen in withstanding injury by friction. When wet, it cannot be injured by finger pressure, and in this respect it is superior to gelatine. The film withstands water and a mixture of alcohol and ether. The sensitiveness is one and a half times greater than that of freshly prepared albumenised paper. The gradation resembles that of celloidin paper. Strong alkaline baths should not be employed for toning it, as alkalies attack the surface. The baths recommended by the makers should be used. The combined bath, with addition of precipitated chalk, works well, also Bühler's sulphocyanide of potassium and strontium, the ordinary sulphocyanide, and the acetate of soda baths, but to the latter a little precipitated chalk should also be added. Fix for ten minutes, and wash as usual. According to Dr. Lilienfeld, the prints should be more permanent than those on ordinary albumen. Dr. Eder has exposed a sulphocyanide-toned print for a month in a window facing south. The print did not turn yellow or suffer any change in colour, saving that due to the bleaching of the aniline dye with which the baryta paper had been tinted.

The Fading of Prints.—The remarks made on page 388 of this year's volume of THE BRITISH JOURNAL OF PHOTOGRAPHY have been emphasised by Dr. R. Ed. Liesegang in the *Photographisches Archiv*. We drew attention to the value of a vigorous negative as an important factor in the permanence of a silver print. Dr. R. Ed. Liesegang, in an article on the structure of the image, remarks that its form is that of a relief with a sharply defined lower surface. There was reason to suppose that more sensitive particles of bromide of silver might be reduced in the lower portions of the film, but it was found that this is not the case. This relief image, forming the negative, exists similarly in prints, whether obtained by chemical development or the ordinary method of reduction by exposure to light only. With a film of ordinary thickness, the deep shadows are printed through to the surface of the paper, whilst under the half-tones is a layer of pure gelatine. If the film is very thick, the picture is held in suspension over the paper by an intervening layer of gelatine. The depth of the relief depends upon the character of the negative, and the proximity of the shadows to the paper will depend upon the scale of gradation in the negative. The print from a thin negative is only on the surface. The old collodion negatives were very vigorous, if not hard, and the prints from them have been more stable owing to the greater strength of image. The fading process usually begins in the delicate half-tones, which are on the surface only, and, if the print is only a thin surface image, it soon vanishes.

Extra-rapid Plates.—Monsieur M. A. Blanc gives the following instructions, in the *Bulletin de la Société Française de Photographie*, for the manufacture of very rapid plates, 25° Warnerke. Take 30 grammes of gelatine, soak it for half an hour in water, and then dissolve it in a water bath. Add 50 c. c. of a saturated solution of alum to the liquid gelatine. This produces a viscid mass that attaches itself to the stirring rod, and, to bring it again to the liquid state, add a few pinches of powdered citric acid. The water bath is kept very hot, and it is preferable to stir the gelatine for some time, rather than add too much acid. The liquid gelatine is then poured into a porcelain vessel, allowed to set, and thoroughly washed. Take of gelatine thus prepared 50 grammes; bromide of ammonium, 15 grammes; and distilled water, 50 c. c. In another vessel dissolve 20 grammes of nitrate of silver in 150 c. c. of distilled water, and add sufficient ammonia to redissolve the precipitate first formed. When the solution of gelatine and bromide is dissolved, add the whole of the silver solution to it at once, and well mix. The remainder of the gelatine is then added. The emulsion is ripened in the water bath at a temperature of 40°, and the following stages are observable:—

1. The sky and disc of the sun are blue, flame blue. Negative vigorous.
2. The sky greenish, flame greenish. Negative soft and full of detail.
3. The sky grey, disc of sun rose colour, flame unchanged in colour. Negative, grey.

These stages succeed each other at various intervals of time. The first is often obtained at once. Generally an hour to an hour and a half elapses before the second stage is observable. This is probably the best stage. After ripening, the emulsion is set, washed, and drained. It is then covered with alcohol and allowed to stand for a night. The alcohol is poured off, the emulsion washed once again and it is then ready for coating.

A New Flooring.—According to *Le Progrès Typo-litho*, the latest novelty in wood ware is wood-pulp flooring. It gives an even surface without joins, and it is a bad conductor of sound. Although very hard, it is as pleasant to walk upon as linoleum. A small quantity of cement is added to the material to increase its durability. To facilitate carriage, it is sent out as a powder in sacks. This is worked into a gelatinous mass, spread upon the floor, and smoothed with rollers. When dry it is painted or grained to imitate natural wood as may be desired. The price is moderate.

THE GUM-BICHROMATE PROCESS.

THE Wakefield Photographic Society met on Friday evening, November 12. In opening the proceedings, the President moved that the members express their hearty congratulations to Mr. A. W. Stansfield, J.P., on his elevation to the Mayorial chair, and hoped he may have health to carry on the duties. This was seconded by the Rev. Aspinall Addison, and carried *nem. con.* The Mayor briefly replied.

Dr. O. Clarke then gave his description of the new process called "Photo-aquatint." Dealing first with the principles of the process, Dr. Clarke pointed out that it had long been held that, to obtain half-tones in pigment or carbon printing, it was necessary that the development should take place from the back of the print. The introduction of the Artigue process showed this to be erroneous, and now there is no doubt about the fact that such prints can be developed from the front, and he cited as proof a collection of over twenty exquisite specimens on the table and hung about the room.

If a mixture of a bichromate salt and of some colloid substances—gum, gelatine, or starch—be prepared, and applied to a suitable surface to hold the impression, such parts as are allowed to be acted upon by light become insoluble, in the proportion to the amount of light acting through the negative, and will be fixed on the support, the portions unacted upon being washed or dissolved away; and, if a colouring matter be mixed with the colloid, that pigment will be imprisoned in the insoluble colloid and so form a picture.

The process is not an easy one, or one in which those with only limited time can dabble, because the paper must be coated and finished as soon as possible, as it cannot be made an article of commerce, on account of lack of keeping powers. At the same time, the process allows of such varied resul s, dependent upon the artistic tastes of the operator, in fact, nothing short of painting lends itself so well to treatment, and that at the very time it is most necessary and effective, viz., during development. The principal difficulties are due to the delicate balance required between various conditions, such as the texture of the paper, amount and colour of pigment, viscosity, acidity, and age of the gum solution, the character of negative and length of exposure, as well as the state of atmosphere and method of development. Any one of these factors may conceal a cause leading to subsequent failure.

Adapted to pictorial photography, as distinguished from "the scientific" photographers who devote themselves to pictorial work, these very difficulties are favourable to the utmost latitude of modification, as they allow a large amount of individuality as opposed to mechanism, and towards evidence of personal artistic feeling, giving the greatest possible latitude to the worker, a latitude which must be allowed to be legitimate so long as the *spirit* of photography is preserved. The lack of an automatic character and the difficulty in making two prints alike are qualities to be admired, from an artistic point of view, rather than drawback.

The several advantages of the process may be summed up as follows: great pliability, the great power of local reduction in development, d obliteration of detail as to the erasure of objects detremental to the cture. Permanency: the pictures are absolutely permanent, *i.e.*, will st as long as the paper upon which they are printed, the only chemical bstance used being easily eliminated, and, unless the pigment chosen non-permanent, there is no reason for any colour fading. Variety of ades of colour is infinite, and at the worker's discretion. Surface of ints, perfect matt. No transfer necessary, no double tones, no film actically, hence no blistering. Water only used in developer, no emicals required, and, when finished, the picture is, in fact, a water lour. As to the surface of print, almost an unlimited field is open. oarse-grained or rough papers give diffusion and loss of detail, with eat power in opening up shadows during development. Smooth apers give detail and sharpness, but are difficult to work. The paper ust be sufficiently sized to prevent pigment sinking into the pores of e paper, as in that case no amount of washing will remove it. To size e paper, a solution of 125 grains Bermuda arrowroot in a pint of water, nd brought near to boiling point, is used. This may be applied with a rush, or the paper floated.

Japanese or Chinese papers are not easily coated, the colour sinks in, nd loose particles are liable to be detached by friction of brush.

Cartridge papers specially; those made by Joynson are admirable.

All drawing papers are useful, but require to be gingerly handled, and re, unfortunately, liable to develop patches perfectly insoluble.

So called stumping paper, thinner than drawing paper, is very good, ut requires very careful handling. It is sold in three shades, white being he most useful. Other French papers are extremely useful, as are any f the old-fashioned hand-made papers of Joynson of St. Mary Cray.

The Colloids.—Any of the colloids may be used—gelatine, fish glue, tarch, albumen—but gum arabic gives softest and most mellow results. t must be of the best quality, and should be purchased in lumps and owdered in a mortar. The gum may be made into a stock solution, but ts behaviour will vary according to its age. When fresh, there is a naximum of solubility, but this is a condition which does not always uit the resulting picture aimed at, therefore it must be used fresh or old s required. It is almost impossible to give any exact formula, on ccount of the uncertainty of the behaviour of the mixture, but a little experience soon makes the operator expert in making the necessary modifications. Here is one formula as an example:—

Gum arabic	4 ounces.
Gelatine (Nelson's cooking)	3 drachms.
Water	6 ounces.

The gum and gelatine are put in a jar, cold water poured on, the jar is placed in a warm place, and contents occasionally stirred until dissolved.

The Colour.—The ideal of pigments would be one which gives in the smallest bulk the strongest colour. All pigments are suitable if inert from a chemical point of view when mixed with a bichromated colloid. The moist water colours sold in tubes are handy, and are very good, but in the main expensive. The powdered colours obtainable at the dealers are perhaps the best. Charcoal or lamp-black may both be used, as may the ordinary chalks or pastels (powdered), burnt sienna, burnt umber. Venetian and Indian red are amongst the pigments most ordinarily required, and which are all suitable. Indigo and ultramarine are not suitable.

There are two methods of preparing the paper, viz., mixing the bichromate of potash with the pigmented colloid, and with this mixture coating the sized paper in the second process. The sized paper is immersed in a solution of bichromate of potash and dried. This is coated with the pigmented colloid, without any mixture with bichromate, and, on the whole, this method is best, the time of exposure is materially less, the whites are purer, and a large batch of paper may be prepared and then stored for coating with the colloid as required. The coating must be thin and even, not seriously affecting the translucency of the paper, and the grain of the paper must be visible by reflected light. If the film be too thick, the whole may wash away. Very rough paper requires a less amount of pigment than smooth. Transparent pigments require more colour, and opaque ones less, black always considerably less than others. The exact mixture of gum solutions cannot be given, the only guide being this, the mixture should go through ordinary coarse muslin. If it filters through in a stream, it is too thin; if pressure is required to force it through, it is too thick. Slight addition of citric acid or a drop of lemon juice may be made when it is intended to use the brush in development, these additions making the gum less soluble.

The coating must be done in good light, dull daylight having no effect on the film whilst wet. The operation of coating must be done rapidly, in order to get evenness of film.

To coat the sized paper, take of—

A.

Gum solution	4 ounces.
Water	6 „

Mix, and squeeze through muslin.

B.

Bichromate of potash (ten per cent. solution)	1 ounce.
Water	9 ounces.

Put equal parts of A and B in a clean mortar, add the pigment or pigments, mix thoroughly, then filter through muslin; then, with a flat camel's-hair brush, proceed to coat the paper.

Mem.—Whilst the mixture is filtering soak a sheet of brown paper in cold water, lay this on a board, wipe away superfluous moisture; now take a sheet of sized paper, and thoroughly wet this, blot off the water, and lay it on brown paper. Now the paper is ready for coating. When coated, hang up to dry, which, in any ordinary room, will not take long.

In the second process the bichromate is omitted from the mixture, water being added to make up for the omission of B, the sensitised paper is coated dry, and will require a little more dexterity to obtain an even coating.

The exposure to light in first process is from three to four times longer than that required for a silver print from same negative, and it is best to give a substantial exposure, as much can be done during development to modify it; in the second process the exposure is about the same as for a platinum print. The exposure may be timed by an actinometer, or it can be judged by looking through the paper, the image showing faintly.

The paper should be printed as soon after coating as possible, it only keeping about two or three days. When printed, if not convenient to develop properly, it may be soaked in water till the bichromate is removed, then dried, and the development finished at convenience.

The development may be done in cold or warm water, and can be assisted here and there by means of brushes, pieces of sponge, water spray, ink-eraser, paper on wooden stumps, &c., the lid of a dry plate box forming a handy palette for the operations.

After the above remarks, Dr. Clarke proceeded to develop two prints, which turned out admirable pictures, the whole function being the most successful in the history of the Society.

PHOTOGRAPHIC ACTION WRIT LARGE.

The large room at the Camera Club was decorated last Thursday evening with what at first appeared to be immense specimens of Japanese embroidery, but nearer inspection showed them to be diagrams painted on a black ground in variously coloured lines. Some thought that these things emanated from the Salon; others, that they were graphic representations of an acute attack of delirium tremens; whilst some few thought that they might be intended for vagaries of lightning. All these surmises were, however, incorrect, the questionable designs being in reality diagrams which illustrated the continuous growth of wheat.

When the fact slowly dawned upon the minds of the members that these things were not the coinage of a diseased brain, but were intended to illustrate a paper by Professor Armstrong, they began to ask themselves what connexion such highly coloured illuminations could have with poor monochrome photography, and they sought for an answer to this question in the advertised title of the lecture to be given, *Photographic Action Writ Large: A Kurvey-linear Conversation on Corn.* But no solution of the problem was forthcoming; in point of fact, the little led to more mystification, and the members could only possess their souls in patience until the Professor put in an appearance to justify both the title and coloured lines.

Professor Armstrong opened his lecture with a few remarks, which might well be commended to others who are in the habit of platform speaking. He had found, he said, in an old book some maxims for the use of lecturers, which he felt much inclined to follow. The first was, "Never make any introductory remarks;" and another was, "Never say why you consented to lecture at the request of the Hon. Secretary," &c. He would, therefore, not throw the usual stones at that indispensable official of the Club, but would at once proceed with the business in hand. "Our bread and butter largely depends upon photographic action." This was a bold statement to make to an audience of amateurs, and suggested the inference that it was meant as a rub to those who put big prices against their exhibited works; but nothing of the kind was intended. The Professor only meant to say that the same sun which prints our photographs ripens our corn. This, indeed, was his text, and formed the apology—although none was needed—for bringing such a subject before the Camera Club.

We were next introduced to a grand old mansion near St. Albans, and a grand old man, its master, in the person of Sir John Bennett Lawes, whose agricultural experiments at Rothamsted are famous all over the civilised world. Sir John—then Mr. Lawes—came into possession of Rothamsted about sixty years ago, and occupied his leisure time in experiments on the growing of cereals, which proved so interesting, as well as valuable, that he continued them in a more systematic way up to the present time. A short time since a Jubilee boulder was set up in his honour, upon which an inscription appears to the effect that it was raised in commemoration of "fifty years' experiments, the first of their kind in the annals of agriculture." A picture of this monument was the first lantern slide exhibited.

Now, in these experiments at Rothamsted, which as we have seen, have been going on without intermission for sixty years, it has been the custom to grow wheat, &c., in different plots, treating each plot with a different kind of manure, and leaving certain plots unmanured for the

sake of comparison. Photographs of these plots were most interesting. We learnt from one that wheat grown continuously on one plot of ground, without the help of manure, and subsisting on the mere mineral constituents of the soil, does not thrive, the stalks being so widely separated from one another that there is a great deal more daylight through them than a careful farmer would care to see. This picture was a great contrast to the next, representing a plot of thoroughly manured land, which stood so thick with corn that it was calculated to make its fortunate owner "laugh and sing," even if it did not itself indulge in such frivolity. This strong dense growth was brought about by either farmyard or artifical manure; the lecturer did not say which, but under certain conditions, he told us, the artificial product will give the better result. The thin or thick growth of the corn was well shrown in the photograph by holding a white screen at the back of the plot.

Having had these photographs placed before us as object-lessons, the lecturer introduced the name of Liebig—known best to the present generation by the big blue signature which serves as a trade mark for the famous extract of beef. Half a century ago Liebig was much talked of among agriculturists in connexion with a theory which he enunciated with regard to the culture of cereals. This theory asserted that, in order to manure the ground efficiently, the ash, &c., obtained by burning vegetable matter, must be added to the soil in order to maintain its nourishing fresh growths—and he declared that it was immoral to go on growing wheat or anything else without this restoration of mineral matter to the ground. This theory came into conflict with views previously held by farmers, who held that nitrogenous matters were far more efficient. Mr. Lawes was the first to put the new theory to practical test on his plots at Rothamsted, and he very soon obtained conclusive evidence that the great chemist was wrong. No increase of yield was followed by this dressing of the soil with mineral matter, but a plot treated with nitrogenous substances at once endorsed the farmer's predilection for old-fashioned methods. Nor was Mr. Lawes satisfied with the results thrown by one plot only; he established several, treating each with a measured quantity of a certain fertilising agent, such as farmyard manure, ammonia, nitrate of soda, &c., and the average results obtained were shown by two diagrams, one representing the yield of corn, and the other of straw. These took the form of a number of vertical lines; beginning with short ones to represent the unmanured ground, rising higher and higher until the highest results were reached with nitrate of soda and ammonia with mineral matter, as advocated by Liebig, much the same results were obtained as on unmanured ground. There was no unearned increment of nitrogen left in the soil, the effect being quite exhausted in one year; but, directly you use such an agent as ammonia, up goes the yield, and directly you stop it down it goes.

The importance of keeping the soil free from weeds was well illustrated by two photographs of small apple-trees planted on the same date, and in all respects but one receiving the same treatment. One of these represented a plant which had been allowed to grow up in company of weeds, and a poor stunted thing it was. The other tree had been kept free from these unbidden guests, and was strong and large, while from its branches depended a goodly stock of fruit. These were bush trees, but exactly the same result was shown in two photographs of standard trees.

Then came a consideration of the big diagrams which had provoked so much speculation before the lecture began. Each coloured line represented the growth of wheat when treated with a certain manure. The green meant soda, the blue ammonia, the red phosphates, and so on, and their upward or downward tendency represented the increase or decrease of yield for fifty years past, the variations being due to climatic vagaries. It was the sunshine that was the principal factor here, and hence we get at the meaning of the title of this interesting discourse, *Photographic Action Writ Large.*

There was much more to be learnt from the diagrams, but the matter was for farmers rather than for photographers, except that the latter, as well as the former, eat bread, and are thus far interested in the growth of wheat. They will thus be glad to learn that, by the generosity of Sir Bennett Lawes, provision has been made for a continuance of the experiments at Rothamsted for another half-century, he having placed with trustees the sum of 100,000*l.* for that noble purpose.

The reading of the paper was followed by a full discussion, and many questions were asked and replied to by the lecturer. The only one to which he did not vouchsafe an answer was why he spelt kurveylinear with a k.

THE CLASSIFICATION OF PATENTS IN RELATION TO A PRELIMINARY SEARCH FOR NOVELTY, AND PATENT-LAW REFORM.

[Paper read before the Society of Patent Agents.]

Complaints are frequently made by disappointed patentees that the British Patent Office grant patents without a preliminary search for novelty, and, as this is done in the United States, Canada, Germany, and other countries, some advocate our adoption of the United States system. Without stopping now to consider the difference in the fundamental principle of the law of patents in this country and on the other side of the Atlantic, or that the change would require us to give up our convenient system of provisional protection, and would restrict the scope of claims, it appears that the complainants believe the alteration wou ensure the validity of all the patents granted. This, as you know, is erroneous belief, and it must be pointed out that while an offi ial sear would certainly be advantageous in some respects, and would be p sumptive evidence of novelty, yet, even if favourable to the applicant, is only in the Courts that a particular patent can be pronounced va after evidence has been taken against it.

In the working of the two systems the British applicant, believing knows more about his own invention than any official can possibly d demands a patent as a right, and, after complying with the prescribed form obtains it, with the admonitory conditions clearly set out in the docume The fundamental principle of British patent law is that of encouraging t introduction of a new manufacture into the country, and, so long as the is no fraud, the patent is given to the first applicant without questio But under the United States system the principle adopted is that issuing the patent to the original inventor only, who is not necessarily t first applicant, and therefore the Patent Office there institutes search amongst all existing patents wherever issued, as well as into boo of reference and other material, too see if some prior inventor h described the invention. To do this thoroughly all such material mu be carefully classified and indexed, and the applicant must distinct formulate all his claims, and submit drawings if required by the natu of his invention, so that they can be compared with former claims similar inventions. The result is that in almost all cases the clain must be restricted within narrow limits; and, if the system were adopt here, we should have to give up our favourite procedure of first lodgi a provisional specification, without claims and without drawing Necessarily, the United States examiners have the power of rejectio and, even when this is fully justified by clear anticipation, I am n convinced that the same power officially used here would be beneficial British inventors.

The United States system is the ideal one, and all experienced ager will freely acknowledge the care and discrimination exercised by the mo acute and experienced searchers in the world, before a patent issues fro the Office at Washington. Owing to careful analysis, and the arrang ment of all inventions in about 200 classes, together with elabora indexes, and the skill and speed with which the most complex cases a investigated and reported on, the issue of a United States patent is itself frequently cited as a sufficient evidence of the novelty of the inve tion it describes. But to justify the system it must be accurat complete, and kept up to date; for, if practical difficulties prevent t carrying out of the ideal system, it is better to content ourselves with o own system with its advantages and known disadvantages, rather than rely on a less practical one, however ideally perfect it may be. Eviden relating to the perfection or otherwise of the American system is therefo of importance.

In the last issued report of the Commissioner of Patents to Congre for the year 1895, he states that the library at Washington contai 1,544,419 patents, which have been issued by the United States and oth nations, and of which 1,213,388 had been issued since 1870. He th goes on to observe: "In the rapid growth of the industrial arts and the enormous accumulation of granted patents, and in the absence any specific assignment of this close and discriminating work of clas fication to a particular and well-organized division, there have crept errors and there remain deficiencies, almost entirely preventible, a yet inevitable from the vast avalanche of records. The exigencies of t Office demand a thorough revision of the whole classification." T Commissioner estimates that five years will be required to carry out th revision, at a cost of nearly 65,000*l.*, and that 4000 volumes for referen should also be supplied at a further cost of 2000*l.*

It will be seen that a serious practical difficulty has arisen in carryin out the requirements of United States patent law, for it is evident th if the classification, indexes, and other references are defective, so mu be the search for novelty, and that under those circumstances man patents have been issued which, in all probability, have been anticipate Moreover, until the revision is completed and brought up to date, th evil must continue and grow; and, considering that nearly five-sixths the 1,544,000 patents have been issued in the twenty-five years sinc 1870, with the ratio of increase growing yearly, it is questionable whethe five years will now be sufficient to deal with the arrears, after the wor has been authorised by Congress. It should be borne in mind that a civilised nations (with two or three exceptions) are supplying subjec matter in the shape of patents to the United States, while that country for her own purposes alone, supplies the examiners who have to digest i Unless the system is modified in some restrictive manner, it appear probable that it must ultimately break down from its own weight; bu meanwhile the sense of security hitherto felt in the possession of a Unite States patent must be considerably shaken.

In proposing "a thorough revision of the whole classification," n recognition appears in the Commissioner's report of the self-destructiv element of growth, an element which will ultimately destroy any syste of classification. It is assumed that a perfect system of classification ca be adopted which will eliminate all former errors; and the same impre sion prevails in this country. It is believed that inventions can be clas sified and indexed like the books in a library, certain divisions an classes being formed and added to from time to time upon the origin lines without disturbing the original arrangement. But this is not th

for not only do additions enlarge each class in which they are placed, they also tend to change the character of the class itself; and of ous diverse classes new ones should be continually formed, and the ones recast. The action of a weighing machine, the opening of a er, and the operation of a gas meter have nothing in common in ordinary aspect; and they are properly put in different classes; but, g to the growth of invention, they are all linked together by the ny in the slot" principle, and a new class (27) is provided for them ur own classification. Strictly speaking, they should be put in a ivision of Class 44, which includes locks and fastenings, because the simply acts as a key to unlock a particular part of the machine.

ie British Patent Office, not being required to make a search preli- ary to granting a patent, is endeavouring to assist an inventor in doing r himself; and this action shoud be encouraged and extended. By a s of abstracts of specifications, relating to various periods from 1617 ie present time, arranged in 146 classes, an inventor may see what nts have been taken out on the subject he is most interested in. The criticism I offer on the work is that there should be a greater ber of classes, a greater subdivision of the subjects, and that the s have been chosen on different principles; but I fully acknowledge difficulties in respect to all these points. The abstracts being illus- d in great part must have an instructional and stimulating effect n any one having the inventive faculty; and, as they are published at one shilling per volume, I trust they will be largely consulted by all nding patentees. To those who can read drawings, and especially to bers of our profession, they will prove very useful, for they will readily ive the scope of these abstracts; but there is something more to be for the information of those concerned with inventions, particularly those more familiar with mechanism than with books—that is, to n an index museum of models representing inventions, which shall be xplanatory to the classification and abstracts as the drawings are to specifications. Professional men are apt to place too high a value n works for general reference, forgetting that others are not so well ified to use them as themselves. Even to experts, an index museum nventions at the Patent Office, and not at South Kensington, would found most useful, especially in cases where the self-destructive ient of growth comes into play. An illustration will perhaps make more convincing.

uppose an inventor designs a cable stopper to control the cable in ering anchor on board ship, and desires to consult the abstracts which available. He employs three principal elements: (1) a U-shaped gh; (2) a chain cable passing through it; and (3) some device of a ping character intended to jam the cable in the trough or to impede notion through it. He finds the subject properly indexed under 113, ision 1, which includes ships, boats, and rafts, and also perhaps, under ss 24, chains, chain cables, &c., and would probably rest here, not ing an anticipation. But his device might be applicable to paying out e-rope cables, and he should therefore look under Class 40, embracing tric telegraphs and telephones, as covering submarine cables. The ie device might be used in lifting, hauling, and loading, Class 78; or lass 109, ropes and cords; or, if reduced in size, it could be used for dow-blind cords; or in Classes 43, 44, and 141, which refer to fasten- , the former and the latter including articles of dress; or Class 141 wearing apparel; while by slight modifications it would apply to le traction and tramway vehicles in Class 103, and to an arc-lamp oon holder in Class 39. Thus, by almost imperceptible variations in ails, it becomes a device for feeding material to some point at which ion is taken upon it, and this would lead us into a large number of the naining classes.

Now, if we had an index museum of models at the Patent Office, in ich devices performing similar functions were placed together, and erences on them to their respective classes, it will be seen how easily entors could follow the line of development and perceive the appli- ility of particular forms of mechanism to new purposes. Of course, only nall proportion of the typical forms would be required for each class, the mples being chosen to show the direction of growth, and, as far as pos- le, the mode of manufacturing the invention itself. In this way not y would the index museum form a valuable aid and adjunct to the clas- cation and abstracts, but it would also prove, I believe, the pioneer of cial technical museums throughout the country, exemplifying the ustries of the several districts. Possibly, with the consent of the easury, the Board of Trade have power already to set up such a seum as an aid to the work of the Patent Office, but public opinion its favour must be shown to exist before the Board can take the tiative. The new extensions of the Patent Office afford an excellent portunity of establishing such an index museum, as I showed in letters the Press last December and January, and the suggestion has already t with a fair amount of approval.

An ideal classification is one in which the elements composing an vention can be referred to in one particular class, that class containing former combinations of the same or similar elements, performing same general function. From this it would follow that no anti- ation could be found in any other class; but, as I have endeavoured show, the growth of invention speedily breaks down all artificial riers between the several classes. But, if by a reform in the law l procedure the Patent Office were to assign an invention to one more special classes, and the patentee allowed to restrict his invention to the same, or even to a special subdivision of a particular class, it would relieve him from much of the danger involving patents. Further, the law should define what is meant by "a new manufacture," and, if it should enact that a new manufacture is one that has not been worked or freshly published during the last twenty-five years, it would probably lead to a revival of many industries which of late years have been leaving our shores, owing to strikes and foreign competition. I put the period at twenty-five years, to give an opportunity of taking evidence from men formerly engaged in such industries, while their memory is dependable; and surely the revival of old industries would be worth the gift of such a restricted monopoly as I have suggested in relation to the classification of patents.

J. Sinclair Fairfax, A.I.N.A., A.I.E.E.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The sphere of activity of the North Middlesex Society lies, as its name would imply, in the northern suburbs of London, and, like its companions, the Hackney and South London Societies, it may fairly challenge comparison with any except the more immediately metropolitan associations. In no direction is its strength so manifest as in the realms of what is called pictorial photography, including among its members, as it does, many exhibitors at the Pall Mall shows and more than one of the Royal Photographic Society's medallists. Its Exhibition is the annual witness to its success in this branch of photography, and is conducted on lines which of themselves testify to the confidence of its executive in the members' abilities. Not only does the Society limit its awards to a handsome but modest certificate, but it relies on its members solely for exhibits. No open classes offer an opportunity for wholesale medal-giving in return for the loan of photographs from outside workers. In this policy, maintained now for a period of nine years, is to be found, we think, the secret of the Society's success, and we commend it to the notice of other associations who may think they are strong enough to give it a fair trial. Certainly the Exhibition, which opened on Monday last at Jubilee House, Hornsey-road, N., compares very well both with its predecessors and with those of other societies which include open classes.

To discuss the exhibits, *in extenso*, which are worthy of mention would make much greater demands on our space than we should feel justified in acceding to, and it must suffice to mention a few only of those which attracted our attention, merely observing that there are many others of which both the exhibitors and the Society may well be proud.

The Judges this year were Messrs. J. A. Hodges and F. C. Lambert, and they have seen fit to award seven certificates and to highly commend eight other exhibits. Whether this latter course is one to be "highly commended" itself is open to considerable doubt; be that as it may, little exception can be taken to the actual awards themselves. First of these goes to No. 6, *A Deserted Mill*, by Mr. S. E. Wall, in which an old windmill is seen under circumstances of lighting, bold, but not, as is too often in such cases, unnatural. Mr. W. Taylor, the Hon. Secretary, receives a certificate for No. 25, *The Close of a Rainy Day*, and Mr. H. W. Bennett one for one of his most successful architectural photographs, No. 33, *The Choir, Ely Cathedral*.

No. 47, *A Road across the Dunes*, by A. J. Golding, we have already had an opportunity of admiring on the walls of the Gallery in Pall Mall, and it is only necessary to say that it is quite up to the high standard of excellence we expect from this well-known worker. Mr. H. Stuart is another successful competitor with No. 101, *An Essex Farmhouse*, while both the ex-President (Mr. J. W. Marchant) and the President (Mr. J. C. S. Mummery) receive similar recognition, the former for No. 93, *Benfleet Creek*, and the latter for No. 178, *Slow from the Sky the Light of Day Declines*. This last is one of the few gum-bichromate prints we have seen which were not offensive in their general dirtiness, and will compare favourably with the specimens shown in that temple of the process, the Dudley Gallery. Like Mr. Wall, Mr. Mummery has selected a mill as his subject, possibly the same mill, the difference being that Mr. Wall appears to have taken it at six or seven a.m., while the genial President of the Society preferred to wait until dark. Messrs. Lisett and Mattocks take certificates for some excellent lantern slides.

This exhausts the list of certificate-winners, but the Judges have commended Messrs. Beadle, Crane, Durston, Goodwin, Johnson, Lisett, Mattocks, and Spencer. We should have been inclined to add at least the name of Mr. H. Smith to these, since his careful and neat platinotypes are by no means devoid of pictorial merit. They say they "are glad to note a general improvement in the work shown, the average quality is promising, and many examples are of distinctly high quality." The tautology of the sentence does not lessen its worth as a testimony to the value of the Exhibition, though it might be held by some to weaken their opinion of the literary ability of those responsible for the report.

In conclusion, we can cordially congratulate all concerned in so successful an outcome of their labours. If any of our readers are in the neighbourhood of Jubilee House, which adjoins the Hornsey-road railway station, on a Monday evening, they could not do better than look in. They will, we are sure, receive a cordial welcome from the Society, and can hardly leave without having learnt something practical about one or other of the branches of photography. Once a month the meeting is

devoted to what is called an "Instruction Evening," specially intended for beginners. The list of these we publish elsewhere, and it will be seen that it amounts to what is practically a course of lessons in elementary photography, which should prove of great service to any one taking up the hobby. The Hon. Secretary, Mr. W. Taylor, of 38, Palace-road, Hornsey, will be pleased to send full particulars of the Society and its work to any one interested.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, December 8, at eight o'clock. Members' Open Night. Slides, &c. Some very old photographs will be shown by Mr. J. Willats, and Mr. W. D. Welford will exhibit up to-date lantern-slide work.

WE are sorry to learn of the death, on November 19, of Mrs. Blundell, wife of Mr. J. Blundell, who for many years has carried on the business of refiner and bullion dealer at Wardour-street, W. The deceased lady was well known in the photographic trade, and until recently took an active part in the business, which is being carried on by Mr. Blundell, sen., and his two sons.

DIPHENAL.—"Ajax" writes: "A few weeks ago you gave an account of a new developer called diphenal. It is quite true that it leaves the shadows clear, and I hoped it would therefore be a good developer for photographs of letterpress. But I find that, though the letters come out perfectly clear glass, it is almost, if not quite, impossible to get the background sufficiently dense. I have tried a number of plates (Mawson's photo-mechanical), giving various exposures, and varying the strength of the developer, but I only get a poor, thin background. For many purposes I think it would be an excellent developer, but I do not think it is of any use for purely black-and-white work."

"THE CAMERA CRAZE."—Herbert Whitecourt, thirty-four, a well-dressed engineer, of North-street, Islington, is alleged to be the latest victim of the camera craze. It was said of him at Marlborough-street that his visit to Messrs. Adams, of 26, Charing Cross-road, was by no means profitable to that firm. He asked to look at some cameras, and, if he had contented himself with looking, all might have gone off nicely; but he went off himself instead, and somehow or other a camera, valued at twenty-one guineas, disappeared at the same time. A pawnbroker recognised Herbert as having deposited the instrument with him for the modest sum of 2*l*. Nothing was known of the accused beyond the fact that he had given a false address, and Mr. Hannay ordered a remand for a week.

THE RESULT OF LENIENCY.—Ernest Henry Cook, aged twenty-three, clerk, was charged before Mr. Slade at the Southwark Police Court, on November 26, with embezzling the moneys of his employer, Mr. Tyler, optician and photographic material dealer, Waterloo-road, S.E. The prisoner pleaded guilty. Detective-sergeant Cox stated that the prisoner was charged at that Court in February last, with embezzling 120*l*. belonging to Mr. Tyler, but, as it was his first offence, Mr. Tyler asked the magistrate to deal leniently with him, whereupon he was discharged upon his own recognisances, and Mr. Tyler took him back into his employ. The prisoner had now requited Mr. Tyler's kindness by embezzling a further sum of 40*l*. Prisoner said he had lost the money through betting on horse racing. Mr. Slade sent him to gaol for three months with hard labour.

THE PRICE OF SILVER.—The abnormally low price of "made" silver, which during the present year fell below 2*s*. an ounce, has given the enterprising German a new opportunity of distinguishing himself. Birmingham jewellers have been waited upon by representatives of the Teutonic coiner with English coins which have been profitably produced in Germany, and offered for sale in this country in order to secure their circulation, either in the ordinary way or in the shape of brooches. The coins most popular were the five-shilling and four-shilling pieces and the sixpences, and it is stated that there is a large quantity of this class of coin at present in England. The profitable nature of the manufacture of such coins will be readily understood when it is explained that even with silver standing at 2*s*. 2*d*. an ounce, as it does to-day, the intrinsic value of a four-shilling piece is only 1*s*. 10*d*. This, of course, does not include the cost of manufacture.—*Birmingham Daily Mail.*

THE Ludlow Photographic Society held its inaugural meeting in the Assembly Rooms, Ludlow, on November 25. The walls of the room were hung with framed photographs (bromide and P.O.P.'s), the work of the members, including several enlargements of much artistic and technical merit. There was also a large display of stereoscopic slides, opals, transparencies, and mounted prints. During the evening a large number of lantern slides, kindly lent by Mr. H. P. Robinson, Dr. Ellis (Liverpool), Mr. Hindley (London), Dr. Paul (Liverpool), and others were shown by the oxyhydrogen light. Mr. Armitage, of the Shropshire Camera Club, also showed some very interesting slides of micro-photographs, and explained how to produce prints on the lantern slides. A letter was read from Mr. H. P. Robinson, in which he presented the Society with a set of his works. During the evening several ladies and gentlemen favoured the company with some songs and recitations. At the close the Mayor warmly congratulated the Society on having such a very successful Exhibition to commence with, and wished the Society every success in its undertaking. From the great interest taken (about 150 were present) the future of the Society seems assured.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S INSTRUCTION EVENINGS.—The following is the syllabus of the Instruction Lectures for 1898, to be delivered at Jubilee House, Hornsey-road (near Hornsey-road Station, Midland Railway), on Monday evenings, as under: January 17, *First Steps in Development*, Mr. Geo. Gosling; February 21, *Modifying the Developer*, Mr. Geo. Gosling; March 21, *The Use of the Camera*, Mr. F. W. Cox; April 18, *The Lens and its Capabilities*, Mr. J. McIntosh; May 16, *Printing and Toning P.O.P.*, Mr. A. H. Lisett; June 20, *Preparation of the Negative for Printing*, Mr. H. Stuart; July 18, *The Manipulations of Printing (including Combination Printing)*, Mr. H. W. Bennett, F.R.P.S.; August 15, *Lantern Slides by Reduction*, Mr. S. E. Wall; September 19, *Selection of Subject*, Mr. A. J. Golding; October 17, *Carbon Printing*, Mr. J. C. S. Mumm; November 21, *Lessons from the Exhibitions*, Mr. R. Child Bayley; December 19, *Platinotype Printing*, Mr. J. W. Marchant, F.R.P.S. The lectures will be particularly adapted to the requirements of beginners and gentlemen taking up the study of photography; the subjects will be treated in a thorough, though elementary, manner, and practical demonstrations will be given of all the processes dealt with. The lectures will commence at 8.15 p.m. Visitors are always welcome. All information may be obtained from the Hon. Secretary, Mr. W. Taylor, 38, Palace-road, Hornsey, N.

"THE HOUSE"—a journal of domestic art for the home (Horace Marshall, London)—has, since its inception ten months ago, fully sustained its original and high-class character. If we may judge from the programme of the Christmas number, to be published on December 1, it will be, in every way, worthy the enviable reputation which *The House* has so rapidly won. The editor claims that the lady of the house will find this coming issue of valuable assistance to her in the arrangement of Christmas hospitality and festivities. "Christmas Decorations" are dealt with, showing how the commonplace scattering of holly and evergreens behind pictures and doors may be superseded, with practically no extra expense and very little trouble, by truly artistic adornment. Then, the Christmas dinner, with a selection of special and seasonable menus, and recipes for their production is given; supplemented by a scheme of table decoration which, if followed, would certainly enable the hostess to enhance the enjoyment of the repasts provided by giving them an extremely decorative setting. The Christmas play is not forgotten. Amateurs desirous of making a suitable set-off to histrionic triumphs have the fullest instructions for the painting of scenery and mounting, a perusal of which would prevent many a *fiasco*. Apart from these seasonable articles, the usual amount of useful and original information on subjects associated with the furnishing, decoration, and management of the home will be included. Perhaps the most important feature, however, is the introduction to the public, for the first time, of a new work for artistic fingers, invented by the proprietors. It is styled "Tarsia," and takes the form of beautiful designs executed in actual woods of various colours. The editor states that these designs may, by following the instructions given, be executed by any person without the least previous training, the only tools required being scissors—and patience. These particulars indicate that the Christmas number will certainly not lack interest for those who love their homes and who wish to improve their surroundings.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).—The Twenty-eighth Annual *Soirée* of this Club was held at the Public Hall on Wednesday, the 24th ult., and proved a great success. The exhibits were, if possible, more numerous, and certainly more varied, however; but the prevailing fog somewhat reduced the number of visitors; still, between 400 and 500 attended. The Photographic Section was well represented, both as regards the number of lantern slides (497) and pictures (eighty-seven). Shown among the latter were five pictures, selected as having received most votes from the *Portfolio* during the five months it has been in circulation. As a result of the admission of ladies to membership of the Club, we were glad to notice that Mrs. Groves had sent in three pictures, and we hope this will act as an incentive to other lady members. Mr. E. Street sent several very much enlarged pictures of snap shots taken on his recent visit to Fair Isle, showing some of the birds and seals found on this isolated rock, situated between the Orkney and Shetland Isles, the groups of seals, herring gulls, and especially the "puffins," were certainly among the very best examples of this difficult study of natural history by means of photography. Mr. Straker says: "The seals are extremely wary, and can only be approached in a boat, with favourable circumstances of light, wind, and sea, and even then are more often than not off before the boat can get near. The puffins are locally named 'Tammy Naries' (Tom of the Nose), from their large beaks." These beautiful photographs were hund in one panel, surrounding a capital portrait bust, by Mr. D. A. Tonelli, of Mr. H. D. Gower, who has occupied the post of Hon. Secretary to the section for some years, but we regret to learn, is about to relinquish that position. Mr. C. Moss sent in four specimens of the gum-bichromate process, among the best we have seen. Mr. J. T. Sandell exhibited ten 15×12 prints, from negatives taken on his well-known multiple-coated plates, some being very difficult subjects, showing, nevertheless, not a trace of halation. Mr. Hoole, one of the most capable workers in the Club, showed three charming prints of scenes on the Norfolk Broads. Mr. P. Crowley sent six enlargements of snap-shots of views in Switzerland and Germany; Mr. Coldwells, some very pretty views in Wales; and Mr. Baldock, eight pictures, including some excellent examples in different coloured carbon. Pictures were also sent by Messrs. East, Platts, Epps, Collyer, Roads, Lincoln, Gower, and by the President, Dr. Hobson. The lantern slides were sent by several of the above members and also by Messrs. Maylard (German views), Grundy (Scotch views), Dodd (a very interesting selection, taken at Constantinople), and Underhill. Mr. Ball showed Ives's kromskop, kindly lent by Mr. D. P. Roberts; Dr. Newby gave a demonstration of the X rays; Mr. L. M. Waterhouse, a fine exhibition of electric apparatus, vacuum tubes, microphone, non-magnetic watch, &c.; and Messrs. Noakes & Norman, of Nelson-street, Greenwich, three exhibitions of the cinematograph. All these shows were thronged with visitors all through the evening.

ASHTON-UNDER-LYNE PHOTOGRAPHIC SOCIETY'S THIRD TRIENNIAL EXHIBITION.—This Exhibition was opened in the Ashton Town Hall on Monday, November 22. The general arrangements resembled those of preceding exhibitions, but some great improvements were observable. The first and most conspicuous change was in the lighting of the large hall and the retiring rooms. The introduction of the electric light has of itself very much enhanced the appearance of the pictures, and it is possible that the improved appearance may be attributed altogether to the advances which

e been made in photography during the last three years. The large ience at the opening were assured by the President of the Society (Dr. nilton) that considerable advances have been made in the art of producing d pictures by photography. Every exhibit is now seen to the best antage, and all who pay the Town Hall a visit during the continuance he Exhibition will have no difficulty in discovering very great evidences change for the better in the admirable pictures shown on the walls. The ned photographs are displayed in the large hall, while in the supper-room assembly-room are the unframed pictures and ster oscopic and lantern es. Here also, arranged on a special stand, are the pictures of the Royal otographic Society, London, with which the Ashton Society is affiliated. n, in addition, there is on view in the supper-room the greatest novelty the Exhibition, the kromskop. In the passage leading to these two rooms trade exhibits, under the supervision of Councillor Phillips and Mr. phen Sharp. There are at least 500 framed pictures, and about 200 framed, and 200 lantern slides and transparencies. There are also eight olving pillar stereoscopes, each containing 50 pictures, making 400 in all. e number of individual exhibitors is about 100. The following is a list the societies and persons from whom collections of photographs, &c., were eived for the Exhibition:—Invited Exhibitors: R. Eickemeyer, New York at by Mr. Giles Atherton, Mayor of Stockport); Ernest R. Ashton, Tunbridge Wells; affiliated exhibits; Smedley Aston, Birmingham; Fred. issonnas, Switzerland; E. G. Boon, Italy; Captain F. Bligh, co. Meath; nel C. Bennett, Chiswick; H. W. Bennett, London; T. Morley Brook, ithington; Harold Baker, Birmingham; W. Booth, Heywood; Byrne & ., Richmond; S. L. Coulthurst, Manchester; Alfred Craske, London; ed. Coop, Birmingham; J. Page Croft, Birmingham; W. Crooke, Edinrgh; Henry E. Davis, London; Karl Greger, Islington; J. D. Groves, rkshire; George Hidderley, Stockport; Horsley Hinton, Sussex; Charles b, Sussex; Alexander Keighley, Keighley; Edgar G. Lee, Tynemouth; orge Lamley, Cripplegate; F. C. Lambert; A. H Marsh, Northwich; f Marlor, Denton; William Rawlings, Hackney; Matthew Surface, Brad-d; Philip von Schoeler, Vienna; Edgar Scammell, London; John Stuart, asgow; James Shaw, Manchester; James A. Sinclair, Brixton; William omas, London; J. Kidson Taylor, Buxton; James Walsh, Patricroft; iss Mathilda Weil, Philadelphia; R. S. Webster; Clifford Young, Blackath; B. C. Kenyon, Davenport. Members Exhibitors: John Andrew, J. W. oadbent, Arnold Bennett, W. C. Brown, Sydney Brown, Walter Chadwick, shton; Tulloch Cheyne, Ipswich; W. Duckworth, Ashton; D. Dodd, ttlemoss; Harold Fielding, Manchester; J. Grierson, Thomas Glazebrook, siah Greenhalgh, W. Godfrey, J. K. Greenhalgh, James Hague, Joseph utchinson, E. H. Hampson, Dr. Hamilton, John W. Kenworthy, Joseph nes, Thomas Kershaw, Samuel Lees, and Walter Leigh, Ashton; J. T. es, Dukinfield; Charles Lord, Audenshaw; Walter Marsland, Leek; H. S. iller, Thomas Newton, S. H. Pickford, Sam Platt, Ashton; Ed. P. Reynolds, neffield; H. Rose, Alfred Shaw, R. Shirt, jun., G. H. Shaw, Charles Taylor, eorge Wrigley, Joshua Whitworth, H. Williams, Charles Wilson, J. Villiamson, W. Waddelow, E. B. Brelsford, Harold Hurst, Stephen Sharp, . F. Manwood, F. Whalley, W. B. Marland, Ashton. Lantern Slides and ransparencies: Martin J. Harding, Shrewsbury; Frank Howard, Wallingord; Charles Reid, Wishaw; Dr. A. H. Marsh, Northwich; Woodburytype ompany; Wilson & Co.; West & Sons; Sam Platt, Jos. Jones, T. Glazerook, Charles Wilson, T. Cheyne, Thomas Kershaw, Charles Lord, Dr. amilton, R. Miller, sen., E. Roebuck, R. T. Marsland, Walter Leigh, J. W. enworthy, Ashton; Ives's kromskop; Phillips & Sharp, trade exhibits.

Patent News.

HE following applications for Patents were made between November 17 and ovember 24, 1897:—

UTTER.—No. 26,980. "Instantaneous Shutter, with Adjustable Aperture." R. KRÜGENER.

AGAZINE HAND CAMERAS.—No. 26,992. "Improvements in and relating to Magazine Hand Cameras." A. C. JACKSON.

TEREOSCOPIC CAMERA.—No. 26,978. "A Stereoscopic Camera for producing Negatives for the Use of the Kromskop and for other uses." E. T. BUTLER.

EGATIVE-HOLDER.—No. 26 989. "An Improved Form of Photographic Negative-holder and Printing Frame." C. H. GALE.

ATT PAPER.—No. 27,033. "Matt-surface Photographic Paper and Process of making same." Communicated by M. W. McDonald. Complete specification. J. C. FELL.

AGAZINE CAMERA.—No. 27,034. "Improvements in Magazine Cameras." K. E. CONLEY and F. V. CONLEY.

IRONO-PHOTOGRAPHY.—No. 27,038. "Improvements in Apparatus for obtaining and projecting Chrono photographic Pictures." Complete specification. C. GRIVOLAS FILS.

NIMATED PHOTOGRAPHY.—No. 27,177. "Improvements relating to Animated Photograph Machines." H. H. MOON.

IN the German gold and silver assay office, heating and smelting tests th acetylene gas were made recently, and are said to have resulted ost satisfactorily. In a short time temperatures up to 1500° C. were oduced. A quantity of nickel was molten ready for casting within irty minutes, while formerly it took from eighty to eighty-five minutes melt the same quantity. A Bunsen burner, specially constructed for etylene gas, furnished excellent results.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
6	Bradford Photo. Society	Annual *Conversazione* and Exhibition of Members' Work.
6	Camera Club	Exhibition of County Slides (Devonshire).
6	Ealing	Lantern Evening. E. Dockree.
6	North Middlesex	Informal Meeting
6	Richmond	Lantern Evening: Members' Slides.
6	South London	*The Camera and the Wheel.* F. O. Bynoe.
6	Stafford Photo. Society	"Jack-of-all-trades" Demonstration. T. W. Davies.
7	Brixton and Clapham	*Picturesque Essex.* George Biddell.
7	Camera Club	Club House Dinner.
7	Gospel Oak	Demonstration with McKellen's Hand Camera. Mr. McKellen.
7	Hackney	*Enlarged Negative-making.* John H. Gear, F.R.P.S.
8	Borough Polytechnic	*Infallible Hand-camera Mechanism.* R. McKellen.
8	Croydon Camera Club	The Thirty-third Public Lantern Show.
8	Kingston-on-Thames	*Developers and Development.* W. Ethelbert Henry.
8	Leeds Camera Club	*Lantern Projection.* W. I. Chadwick.
8	Leicester and Leicestershire	*Carbon Printing.* G. Bankart.—*Actinometers and Exposure Meters.* E. B. Miles
8	Leytonstone	Practical Demonstration: *Carbon Process.* The Autotype Company.
8	Photographic Club	*Some very Old Photographs.* J. Willats. —*Up-to-date Lantern-slide Work.* W. D. Welford.
8	Southport	*Lantern-slide Making by Contact and Reduction.* S. L. Coulthurst.
9-11	Aintree	Exhibition.
9	Liverpool Amateur	Annual Meeting.—Exhibition of Prize Slides.
9	London and Provincial	A Paper by E. J. Wall.
9	Manchester Amateur	Lantern-slide Testing Night.
9	Woolwich Photo. Society	*Practical Testing of Speed of Plates for Amateurs.* Mr. Bullen.
10	Borough Polytechnic	*Toning.* A. J. Bullock.
10	Croydon Microscopical	*Hand-camera Work.* W. Thomas.
10	Darwen	Prize Slides
10	Ireland	*The Artigue Carbon Process.* George Mansfield, J.P *The Making of Lantern Slides for Book Illustrations.* Greenwood Pim, M.A.
10	Plymouth	*Portraiture in the Studio.* Harold Baker.
10	Wakefield	Bromide Printing Demonstration. Hon. Secretary.
11	Woodford	Exhibition of Members' Work.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 25,—Mr. J. E. Hodd in the chair.

The following question from the box was read: "Can it be taken that the sulphides of all the noble metals are permanent?"

In the discussion which ensued it was pointed out that Mr. Bothamley had shown that, in the case of gelatino-chloride papers toned in the combined bath, the toning was due to sulphide of silver, and that it very soon disappeared.

Mr. A. HADDON spoke to the effect that sulphide of silver was unstable.

Mr. E. BANKS said there were many forms of sulphide of silver. As regards toning processes, there was sulphur toning as distinct from sulphide toning. This latter was very permanent, and he had prints done many years ago in this way which were in splendid form. Asked to describe the sulphide toning, he said it was first necessary to thoroughly fix the print, two baths being used, after which it had to be freed from every trace of hypo in water. This was most important, as on it depended the success of the subsequent treatment. The print was then toned in one of the sulphides—ammonium or potassium sulphide—in extremely dilute solution, being afterwards well washed. The print so obtained was exceedingly permanent and of a good colour. Purple-black or warm browns could be got, and the results were not to be distinguished from gold-toned prints. The strength of the toning solution would be about two or three drops to the pint of water; if much stronger, the whites would be impaired and the resulting print of a dirty-yellow tint. In reply to a question as to whether or not the toning was superficial, he said that, if the print were examined, the colour would be seen to have penetrated right through, and the fact that prints thirty years old were in his possession at the present time was good proof of the permanence of the process. The paper was printed to the usual depth, and toning was generally complete in ten or fifteen minutes.

Mr. EVERITT quoted from Captain Abney, to the effect that sulphide of silver was the most stable of the silver compounds and that there was no reason why it should fail to give permanent prints.

A question reading: "What is the cause of the alteration in the tone of gelatino-chloride papers if left in the printing frame for several days?" gave rise to considerable discussion, it being assumed to refer to the difference in the subsequent tone of a quickly printed and a slowly printed photograph. The question was also approached from other points, one speaker finding that prints left for any considerable number of days between printing and toning often proved wasters, while another found that it was when the prints were left in the frame, and not if they were packed up, that the results were affected. The possible action of the indiarubber padding was mentioned, and the CHAIRMAN recalled cases where toning refused to proceed, resulting in streaky prints, ascribed to the rubber cloth used in the frame.

Mr. A. HADDON took up the position, that if a print were properly kept after printing, from deleterious gases, sealed up, it should keep for any

length of time. He could not agree that any continuing action of light was responsible for the action.

Mr. EVERITT asked what stood in the way of plate-manufacturers putting upon the box the development factor, in addition to the Hurter & Driffield speed number?

It was observed that in some cases, at least, this practice would be found to give more information of the value of the plate, and its nature, than was to the interest of the manufacturer, and that under such conditions shilling-a-dozen plates would be worth twice as much.

Mr. EVERITT looked for this information to enable him to develop his plates in such a manner as to get that scale in his negative which would give him the full scale of the paper he was using, and to work for no more. Taking the every-day work, he asked, Why should one not be able to develop his plate in such a manner that the range of the plate should be exactly suited to the paper habitually used?

Mr. BANKS observed that the printing-out papers of the present day had a very short range, black to white certainly, but with very great jumps.

Mr. BECKETT thought this the chief defect of photography, this jump being very evident, whereas in engravings the tones graduated down so very finely.

Another question, as to the best method of making paper negatives transparent, was taken from the box.

Mr. BANKS, replying, said is was first necessary to extract all the sizing from the body of the paper, and this was done either with warm water or a little hydrochloric acid and water, which would not affect the image to any extent. A drachm to a pint would be about the strength of acid solution. By the time the size was all removed the paper would feel pulpy, when it could be removed. The size resisted the wax and did not allow it to permeate the whole of the paper; but the removal of the size would not weaken the paper, as the wax would take its place. Paraffin wax or any similar material could be used for rendering the negative transparent.

PHOTOGRAPHIC CLUB.

NOVEMBER 24,—Mr. W. D. Welford in the chair.

Mr. SIDNEY KEITH, before a very numerous audience, gave an interesting account of a journey he made from

LIVERPOOL TO ALASKA,

accompanying the same with lantern slides from photographs taken during the trip. Some of the slides, which at first sight might have been thought to be in carbon from the colour of them, were said to be toned Alpha plates, and Mr. Keith thought the effects produced were well worth the trouble required, which was considerable. One could not always depend on getting these effects, and a certain photographer had, to Mr. Keith's knowledge, wasted grosses in his attempts; but, notwithstanding this, when the effects were obtained, they were quite worth the expenditure of time and trouble. The slides included views in New York, of Niagara Falls, a large number in the Yellowstone National Park (wherein the lecturer's experiences with certain bears took place), of the wonderful hot springs and geysers, and the massive mountains and rock formation occurring in this district, and of the grandeur of Yosemite. Coming to San Francisco, the opium dens in Chinatown were shown, after which followed views of the life and dwellings of the Indians, and Alaskan scenery.

A hearty vote of thanks was accorded to Mr. Keith.

Mr. Guardia, in bringing forward Messrs. Newman & Guardia's new cinematoscope, preceded an exhibition of its capabilities with a short account of what had been accomplished in this comparatively now branch of photography, referring to the work of Edison and to Lumière's machine, which was really about the first to successfully project moving photographs upon a screen. The difficulties of the process were numerous, and in dealing with films ranging in length from 70 to 150 feet, the operations of exposure and development require very careful handling. Added to these was the necessity for perfect precision in the perforations, without which smooth and even running would be impossible. Messrs. Newman & Guardia set themselves the task of overcoming such defects as imperfect perforation, as well as shrinkage of the film after drying, and had produced a machine possessing the power of self-registration, so that it automatically corrected any fault or inequalities in the transparency film. They claim to have made a machine sufficiently portable that one man could work it alone, and undoubtedly its small bulk was an agreeable feature when compared with some of its predecessors. Mr. Newman proceeded to show the working parts of the instrument, and the device provided to overcome (within certain limits) any faults in the perforations of the film. By means of this instrument the following subjects were thrown upon the screen, and attention was drawn to the fact that the background and stationary objects were without any semblance of movement: Piccadilly Circus, steamers on the Thames (arrival and departure), sack race, sheep washing, wave study in Cornwall, and the Tower Bridge.

Croydon Camera Club.—There was a large gathering of members at the Club rooms on Wednesday, 24th ult., drawn by the announcement that Mr. JAMES FACKHAM, F.R.P.S., intended to publish and explain his discoveries and improvements in the method of working what is known as

THE GUM-BICHROMATE PROCESS,

a means of printing which has found great favour in the eyes of the more artistically inclined exhibitors of photographs. An attractive collection of prints had been tastefully arranged upon a special screen in illustration of the capacities of the process. The aforesaid and others which were handed round, included gum prints by Messrs. Hector Maclean, Charles Moss, Rogers, and the lecturer. In the course of some preliminary remarks, the PRESIDENT dwelt upon the advance in the power of producing high-class results which the gum process gave. There was, however, a great amount of prejudice against the process in the higher circles, partly from those who had a terrible dread of clever people," who are artistic to the finger tips—but beyond—and in part from those who didn't wish to be bothered to learn new set of tricks. He dwelt upon the distinction between means and explained when "faking" would be a grossly fraudulent proceeding, having asserted that whilst hundreds of photographers might possess the of pictorial composition, their capacity might stop at delineating, concluded by asking, "Are you simply, because you lack facility in freehand drawing and the like, to let your artistic faculties lie dormant and be lost? There be but one answer. If you can make out of a poor photograph a fine picture by all means do so." Mr. PACKHAM, whose rising was greeted with much applause, then proceeded with his lecture, which explained with great clearness what paper to use, what brushes and other appliances to employ, how the sensitising and coating is performed—including quantitative formulæ for combining pigments with gum, and explained the processes of development. The lecturer subsequently coated several sheets of paper, preparing the pigmented gum, and showing how the coating and polishing off are performed. At the conclusion of the demonstration, Mr. Packham answered a number of questions regarding keeping qualities of the paper. The lecturer had found paper good after about seven days. The PRESIDENT stated that the prints he showed were upon paper which he had kept for not less than fourteen days after being coated. Mr. Rogers handed round an interesting panel of hard wood, upon which he had printed a gum-bichromate image. A eulogistic vote of thanks was adopted by the meeting with much enthusiasm. Mr. S. Wratten exhibited a telling collection of snapshots of Croydon Fair, which showed that the keeping qualities of the new special Wratten plate are equal to its other good points, the above being taken upon plates over five months old. Some other snap-shots of cattle, &c., taken at Mitcham Common on Friday (a foggy day), indicated the extreme sensitiveness of the above plate.

Kingston-on-Thames and District Photographic Society.—A paper on *Negative-making*, by Mr. JOHN A. HODGES, was the entertainment provided for the members of the above Society on Wednesday last, and was listened to by a small but appreciative audience.

Richmond Camera Club.—At the meeting on the 15th ult., at which Mr. Cembrano presided, a letter was read from the Hon. A. Nelson Hood, thanking the Club, on behalf of the Duke of Teck, for the resolution of sympathy passed on the 1st inst. On the 22nd ult., Mr. Purcell in the chair, Mr. J. GIBSON gave a very practical and useful demonstration of Lantern-slide Making. He showed how to obtain different tones, and how to improve slides by the judicious use of the Howard-Farmer reducer. A good number of beginners having joined the Club this season, the demonstration was well timed and greatly appreciated.

Bradford Photographic Society.—Mr. P. ELLIFF, who for many years practised the art of

PHOTO CERAMICS,

gave a lecture and demonstration before the members of this Society on Monday night. Mr. Elliff, in his opening remarks, pointed out to what uses this now-neglected branch could be put, and remarked how astonished he was that it had not gained more in popular favour, as it was not only easy to manage, but also scored with regard to expense, the total outlay not necessarily being more than a few shillings. The photographs, he pointed out, were perfectly permanent, and the range of colour allowable was practically endless, while the finished results were suitable for the decoration of either the palace or the cottage. The lecturer then, after a short disquisition on the why and wherefore, proceeded with the practical portion of his lecture. He first of all coated a small sheet of opal with his sensitising solution and organifier, collodion, &c., and then made an exposure under an ordinary transparency to about seven feet of magnesium ribbon. He then dusted on, by means of a mop, the prepared brown powder, the image gradually growing in strength, until, notwithstanding the difficulties under which he had worked, a really excellent result was produced. He regretted that he was unable to fire his production, but showed a cardboard model of a stove, which any blacksmith would construct at a cost of about half-a-crown, and which could be used in the kitchen in place without the slightest inconvenience to the household.

Leeds Camera Club.—Continuing his series of elementary lessons in photography in the rooms of the above society, Mr. C. C. VEVERS demonstrated the process of

DEVELOPMENT,

on Wednesday evening, the 24th ult. Mr. Vevers strongly recommends that all the factors employed in development—reducers, accelerators, and restrainers—be kept in separate solutions, and in such a manner that the user knows how many grains of the salt are contained in each drachm or ounce of the solution. In this way, knowing exactly the proportions of each chemical in his developer, he has more control over its action, and he can modify its constituents to suit his negative or subject and rectify errors in exposure. For the normal development of correct exposures Mr. Vevers advises the combination of two reducers—viz., metol and hydroquinone, because the former gives great detail and softness, and the latter strong contrast and density. The normal developer recommend by the demonstrator consisted of hydroquinone, 2 grains; metol, 1 grain; potassium bromide, 1 grain; carbonate of soda, 20 grains; to each ounce of water. In cases of over-exposure he greatly increases the hydroquinone restrainer, omits entirely the metol, and reduces the accelerator. For under-exposure he omits the hydroquinone and uses the other ingredients as given above. Mr. Vevers advocates the tentative system of development, and during the evening developed a number of plates by this method, and clearly demonstrated how cases of over and under-exposure could be remedied by careful development.

Leigh Photographic Society.—November 19, Mr. M. F. Burrows presided. —Mr. S. D. McKellen gave a demonstration of the infallible hand camera. The system of changing is very ingenious, and is, as the name implies, infallible. Mr. McKellen showed a camera with a plate-glass side to show the simplicity and sureness of the changing, and the action of a grip to keep the plates fast after changing; also the action of the lever shutter. The camera is well finished, and everything a hand cameraist desires.

ıtry Village Competition was decided in favour of Mr. Tom Haddock the prize, *A Wet Day*, a view at Rosetherne; and Mr. Hampson second prize, a view of Grasmere Village.

verpool Amateur Photographic Association.—The monthly meeting held in the club-rooms, Eberle-street, on Thursday evening, November 25. PRESIDENT (Dr. J. W. Ellis), who was in the chair, drew attention to annual competition and the forthcoming Corporation Spring Exhibition, e held at the Walker Art Gallery, in which the Society had been ed to co-operate. Mr. WILLIAM HARVEY afterwards delivered a lecture, cled

A HOLIDAY IN GERMANY,

ing Cologne, Coblenz, Worms, Heidelberg, Wurzburg, Nuremberg, &c., vhich places he showed a number of excellent slides, the most noticeable g a beautiful set illustrating Longfellow's poem on Nuremberg. The ure throughout was most interesting and enjoyable.

lymouth Photographic Society.—November 26, Mr. J. Davy Turner in chair.—Mr. W. E. DRINKWATER (Messrs. Gill and Drinkwater, Devonport), a lecture and demonstration upon

CARBON PRINTING,

single and double transfer. He said in Wilson's *Cyclopædic Photography* interesting process he proposed to demonstrate that evening was dismissed summary manner. After reading the matter devoted to the process in work, he said he thought it was doing scant justice to the most beautiful cess photographers have at their command—a process absolutely incomable to any other in variety of colour beauty, and permanency of finished ılts. He had heard the opinion expressed that the climate of the West of gland was particularly suited to carbon work; on the other hand, one of most accomplished carbon printers he knew, and one who had worked for rs in the town of Plymouth, to'd him that the humid atmosphere of the ghbourhood was a great drawback. As far as his own experience went, he worked the process in the North, in the Midlands, in the South, and in West of England, and found no appreciable difference in any place. He this was accounted for easily. in that, with one exception, namely in Hull, had always worked with ready-sensitised tissue, and, as the effect of climate more likely to affect the tissue during drying than at any other time, he ver used unsensitised tissue when he could get it ready prepared by skilled ıds who devote their entire time to the work. There were disadvantages, he ew, but the compensating advantages far out-weighted them. Mr. Drinkter then briefly explained the underlying principle of carbon printing, and, er showing some pieces of printed tissue, kindly supplied him for the monstration by Messrs. Elliott & Son, of Barnet, proceeded with a practical monstration of the process, obtaining some excellent results. After votes of ınks to Mr. Drinkwater, Messrs. Elliott & Son, and the Chairman, the proedings terminated.

Preston Scientific Society (Photographic Section).—On Monday evening, vember 22, the first meeting of the Photographic Section of this Society s held in the Section Room, Cross-street. There was a large attendance of embers to hear a lecture on the

SANDELL PHOTOGRAPHIC PLATES,

d to witness a demonstration of their development by Mr. J. T. SANDELL. ıe lecturer began by claiming for the plates that which was commonly said them—that they prevented halation. While this was a great advantage, it ıs by no means their most valuable superiority. The plates and films gave enormous latitude in the matter of exposure; their development was mple if a fixed and known developer were used; and last, but by no means ast, they gave greater gradation and fuller half-tones than any other on the arket. Mr. Sandell then entered in detail into the manner in which the ates were manufactured. The top film, he explained, was as sensitive as any ate upon the market. Beneath this was a slow landscape film, while on the ple-coated plate there was a still slower coating of emulsion immediately front of the glass. The upper, or fast film, he explained, practically allows e blue or chemically most active rays to pass through it; the second layer, ich is four times less sensitive, allows only a mere trace of the blue rays, xed with yellow and red, to pass; then, in the triple-coated plates, these ys, except red, were entirely arrested by the third or slower film of all. It uld thus, in the double-coated plates, be seen that, with only a shade of ıe, yellow, and red rays passing, it would be impossible to get halation der ordinary circumstances, as the thick film would deter the reflections of e light. On that ground double films were ample for all except the most traordinary work, such as dark interiors with clear glass windows, or where ne of the source of illumination were included. After this Mr. Sandell oceeded to explain in detail the various chemical actions set upon the films ring the exposure and development, all of which proved deeply interesting the members. Subsequently Mr. Sandell developed six quarter-plates, ich had received exposures varying from five seconds to five minutes, the bject being the interior of a studio, and all came out well. The lecturer s plied with quite a number of questions on both the scientific and practical es of his lecture, and all were answered in the most satisfactory manner. enjoyable portion of the evening's proceedings was the exhibition of a ge number of lantern slides, principally of interiors of the best-known hedrals, abbeys, and buildings of England and the Continent, which proved ite a revelation to several experienced slide-makers present, and prints of same views. At the conclusion of the proceedings, on the motion of Rev. S. E. Collinson, seconded by Mr. Turner, a vote of thanks was corded to Mr. Sandell, and, by common consent, the evening was voted one the most instructive ever held by the section.

FORTHCOMING EXHIBITIONS.

1897.
cember 9–11 ..... Aintree Photographic Society.
,, 28–Jan. 1 . Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough-road, S.E.

1898.
January 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
,, 29–Feb. 26 . Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.
January–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30 .... National Photographic and Allied Trades Exhibition. A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14..... International Photographic Exhibition (Crystal Palace). R. Child Bayley, 12, Hanover square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

TRANSPARENCIES FOR HALF-TONE PROCESS WORK.

To the EDITORS.

GENTLEMEN,—In the current issue Mr. Bolton's suggestion of placing a transparency between the screen and the plate on which it is reproduced in reverse is the method I have employed for some years, and a short account of it was published in *Process Work* for May 1896. I use no camera, but a Hume's enlarging lantern provides the source of light and carries the diaphragm in the lens mount. The screen is placed in a printing frame, on it the necessary packing to get the screen distance I want, then the transparency in contact with a backed ordinary gelatine plate, the whole being kept together by the printing-frame bar. The frame is then set up at about eighteen inches from the lens of lantern. I use copper, and form the resist as in photogravure, omitting use of a dusting box. In my opinion this is a very good process for amateurs. Type blocks or intaglio plates can be made by it, the only part of the necessary apparatns not found in most amateurs' dens being the screen. Of course the operation is carried out in the dark room till the plate is fixed. I regret that a bad shoulder has prevented my working the process for many months.—I am, yours, &c.,

J. A. C. BRANFILL.

25, *Rosendale-road, West Dulwich, November* 27, 1897.

THE NATUROGRAPH SYNDICATE, LIMITED.

To the EDITORS.

GENTLEMEN,—In reference to a paragraph in the prospectus of the Naturograph Syndicate, Limited, quoting some observations of mine in a paper on *The Heliochrome Process*, read before the Royal Photographic Society, I beg to say that these observations had no reference whatever to the Naturograph process, with which I am in no way connected, and into the merits of which I would prefer not to enter.—I am, yours, &c.,

PAUL L. WATERLOW.

Finsbury Stationery Works, E.C., November 23, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

A. G. Symmons, 57, Gondar-gardens, West Hampstead. - *Photograph of sea view.*

J. C. Hall, 46, Range-road, Whalley Range, Manchester.—*Photograph of Harry Storer, football player, of Liverpool. Photograph of James Trainer, football player, of Preston.*

CHARLES E. BENHAM, WHITE LIGHT, ENQUIRER.—Received; in our next.

COPYIST.—The reproductions are probably copyright.

J. CLEGG.—We have no further address than that given in the letter quoted.

A. M. R.—We do not answer questions unless the names and addresses of inquirers are given.

J. F.—The address is T. & R. Annan & Sons, Sauchiehall-street, Glasgow, N.B. The firm undertakes such work as you refer to.

COPYRIGHT.—COPY. We believe it to be one of the late Sir J. E. Millais's early pictures, but are not sure. However, a search at Stationers' Hall is the only course open for ascertaining whether the picture is copyright or not.

STAINED PRINT.—R. W. The stain on the white part of the print is due to the colouring matter on the chocolate-coloured mount being, to an extent, soluble in water. Hence the mountant has dissolved some, and it shows through the photograph.

MORPETH.—We believe the photographer renders himself liable to prosecution, unless he holds an appointment by Royal Warrant.

F. W. TASSELL.—1. Doubtful, as you appear to have received payment for some of the photographs. 2. Better consult the Copyright Union. 3. Apply to the Secretary of the Union, Mr. H. Gower, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

VARNISH.—W. S. J. You must have compounded the varnish with a very inferior sample of sandarac or with some resin that was not sandarac at all. With the formula quoted, the paper certainly would not stick to the varnish had good material been used. Possibly the solvents might be at fault.

W. B. S.—By placing a negative lens between the combinations you will be able to lengthen the focus of your rectilinear. Your simplest plan will be to procure a series of spectacle lenses from a working optician. These will be inexpensive, and resort to trial and error will tell you what you wish to know.

THE POISONS ACT.—DEALER. The absurd Poisons Act prevents you, unless you are a pharmaceutical chemist, from selling a small quantity of cyanide of potassium or of bichloride of mercury for photographic purposes, even if you know the purchaser. If you do so, you run the risk of having the Pharmaceutical Society down upon you for their five pounds penalty.

ADDRESS WANTED.—A CONSTANT READER says: "I shall be obliged if, through your Queries column, I can find either the address of Mr. Smallcome, photographer, of 16, Baker-street, London, or who purchased or what became of his negatives. I want to get prints of photos taken some thirty years ago."—Perhaps some reader will supply the information desired by our correspondent.

ARTICLED PUPIL.—EXECUTOR. There are no "fixed terms" with regard to the articling of pupils in photography. As you ask for our "candid opinion" as to the terms asked by the photographer in question, we will give it. We say that, in the interest of your charge, they are very far too high for what the youth would receive in return in such a business. Find some better investment in the lad's behalf.

PYROGALLIC ACID.—C. COLEBROOK. For exact work you must not rely upon an ounce bottle of pyrogallic acid containing exactly the ounce, for it is doubtful if it is usually very accurately weighed, if weighed at all. We have at times found much over the ounce in some bottles—once a drachm over weight. Sometimes, though rarely, a little under the ounce. For accurate formulæ, the pyrogallic acid should always be weighed.

COLONEL GUBBINS.—By temporarily placing the lens on the camera front, focussing the image of a gas flame, removing the ground glass, and rotating the lens, you may obtain a good idea as to whether the lens has been properly centered. The images of the gas flame should remain stationary when the lens is rotated; if they do not, the lens has not been properly centered. Most books on lenses give this method as a test for centering.

VARIOUS.—MUCH OBLIGED writes: "1. Please give a formula for a retouching medium. 2. Also, is there any good varnish not needing a medium previous to retouching? 3. And would isochromatic plates (or any other) minimise the appearance of freckles on negative?"—1 and 2. Formulæ for both will be found in the ALMANAC for the current year, the former on page 981, the latter on page 971. 3. Yes, if the plates are sensitised for the yellow rays, as most isochromatic plates are.

MOUNTING BROMIDE says: "I should be glad if you could inform me the best method, or general routine, for mounting P.O.P. prints in large batches, *i.e.*, professional work? Having worked albumen up till the present time, I find great difficulty in getting through the mounting operations in a reasonable time when using P.O.P."—Proceed as with albumen prints. When you get used to them, you will find that gelatine prints will not take much, if any, longer to mount than albumen ones.

FINISHING.—B. & W. writes: "I should be extremely obliged if you would kindly tell me whether (1) platinotype enlargements can be finished like bromide, with carbon drawing pencils, stumping chalk, powdered black lead, and pumice powder? 2. Should the platinotype print be rubbed first with pumice powder, as is the case with a bromide? 3. Also, where can I get a good spray and fixative, and how is it applied?"—In reply: 1. Yes. 2. Scarcely necessary, but, if the colour does not take readily, it may be used. 3. Write to the Aerograph Company, Memorial Hall, Farringdon-street, E.C.

RIGHT TO NEGATIVE.—J. C. JOHNSON (an amateur) writes: "Two of my sisters had their portraits taken at ——'s, and had six copies each. Now, the price of copies, asked, is half a guinea per dozen, and, as I am an amateur, I would do them for my sisters for nothing. I called on Mr. ——, and asked him to hand over the negatives to me, and he point blank refused. Can I not demand the negative, as my sisters paid for the portraits?"—Yes, certainly you can, as you can demand anything you like. But you will certainly not obtain the negatives, as they are the property of the photographer. That point has been decided over and over again.

BROMIDE ENLARGING.—S. STERNE says: "Can you tell me why I get such inky tones when I make an enlargement? I use ——'s extra sensitive bromide paper, and enlarge by daylight. Until recently I got beautiful warm tones, but now I only get these beastly things. I have nearly doubled the exposure that I gave in the summer, so it cannot be under-exposure. Is it not the fault of the paper?"—That is very unlikely. The fault is clearly under-exposure and forced development. "Nearly doubled" is not nearly enough, with the light of November, to compensate for summer light. Try with from four to six or more times the exposure you gave in summer.

COPYRIGHT.—OXONIAN. We cannot remember the picture in the Roy Academy, so cannot express any opinion as to whether it was, or w not, a copy of the photograph enclosed. If it is, however, you c certainly proceed against the painter—A.R.A. though he be—and r cover damages, and also the forfeiture of the picture. The law appli as equally to painters pirating photographs as it does to photographe pirating paintings. The law makes no distinction. If the painting really made from a copyright photograph of yours, the A.R.A. wi doubtless be glad to make any terms he can with you, rather than ha the piracy, if it be a piracy, coming before the public.

GUY SIMMONS.—1. Better consult some exhibition catalogue, wherein yo will find a good choice of titles. 2. The makers do not recommen such a formula. However, the following may answer:

1. Pyro	55	grains.
Metol	45	,,
Metabisulphite of potash	120	,,
Bromide of potassium	20	,,
Water	20	ounces.
2. Carbonate of soda	4	,,
Water	20	,,

Take equal parts for use.

YANKEE.—We do not recollect any special articles on the subject of warm ton with bromide and chloro-bromide plates, nor do we think it has bee ventilated to any extent, except in so far as it may have occasionall cropped up at the meetings of different societies. Speaking fro memory, we believe that about 1880 or 1881, when Dr. Eder d monstrated the possibility of producing a great variety of tones wit films of chloride of silver, some attention was given at the Londo societies to the development of such plates with ferrous citrate an citro-oxalate, but whether any detailed accounts of experiments we published at the time we could not say without a lengthened searc You will probably find articles on the subject in the ALMANACS abou that period, as well as formulæ

TRANSFER OF COPYRIGHT.—A. X. Z. writes as follows: "I am in treat for a business in the Midlands, and amongst the stock of negative are some two or three hundred that are valuable stock one which the vendor has made copyright, and which will be include in the purchase. What I am in doubt about is the copyrigh —or, rather, my right to it—in these negatives, seeing that th law says the copyright is vested in the author of the work. If purchase the business, do I acquire the copyright in these negatives? No, you do not, unless the copyright in them is legally, and separately transferred to you. Unless that is done, although the negatives ar your property, you will have no copyright in them; that is to say, yo could not recover damages from any one pirating them.

STEREOSCOPIC PHOTOGRAPHY.—ST. NICHOLAS says: "I am taking the libert of forwarding for your inspection a few productions of mine, and woul like to know: 1. If the subjects are well chosen for this class of work 2. If they are rightly paired, or transposed? 3. Is the definition cris enough? Mine do not appear so sharp as the one marked +, which i not mine. 4. Would you recommend other lenses than single ones 5 inch focus, which I use? if so, the most suitable. 5. Are the gre mounts or the chocolate most suitable in competitions? and do yo think this work eligible for competition?"—In reply: 1. There is con siderable room for improvement in this respect. Always have som prominent object in the immediate foreground. 2. Yes; but the for ground centres should be under 3 inches. 3. Quite sharp enough. Lenses of that focus are the best for all-round work; but personally w have a preference for 3½ or 4 inch, on account of the larger includ angle in the finished prints. 5. Chocolate mounts are to be preferre You would stand absolutely no chance in an open competition.

ALFRED MOORE.—From your careful and explicit account of your experiment we wish all correspondents would follow your example in that respect we are able without any hesitation to show you how you have failed s far. You appear to have followed the instructions correctly up to certain point, and only fallen short of the proper result in consequenc of not carrying the process far enough. In the first place, the propo tions for ferrous sulphate and sodium carbonate are sufficiently near fo the purpose, as, supposing you employed the *crystallised* carbonate, ther would only be an excess of somewhat less than a hundred grains in th eight ounces. If, however, you used the anhydrous salt, which we d do not think likely, the case would be very different, as the excess o carbonate would be the first to engage the sulphurous acid. We do no know that a small quantity of sulphate of soda thus formed would b any detriment to you, being an unnecessary waste of acid. The nex action of the sulphurous acid would be to convert the carbonate int sulphite of iron, in doing which the gelatinous nature of the magma i destroyed and it becomes liquid; and this is the point at which yo appear to have stopped. But the sulphite itself is insoluble, or nearl so, in water, and at this stage is present in suspension as a dirty yellowish-brown powder, which you seem to have filtered out. It i only when the solution has absorbed a considerable excess of the ga that the sulphite is taken up, and, as you say your filtered solution wa neutral, this condition had evidently not been reached. The process i a lengthy and troublesome one, as we stated in our article. The resul you record as following the addition of pyro is curious, though the fac that no "purple precipitate" was formed does not prove that no iro was present, as that only occurs with *ferric* salts. In the case o ordinary ferrous sulphate it is the oxidised portion that gives th colouration. The solution would contain sulphate of soda, a smal quantity of sulphite, and possibly a trace of iron, but nothing to supply any alkaline stimulus to the pyro; on the contrary, nothing bu restrainer.

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NOTICE OF REMOVAL.

ON JANUARY 1, 1898, THE OFFICES OF THE "BRITISH JOURNAL OF PHOTOGRAPHY" WILL BE REMOVED TO No. 24, WELLINGTON-STREET, STRAND, LONDON, W.C.

EX CATHEDRA.

THE prospectus of the Naturograph Syndicate, Limited, is not a satisfactory document. The capital of the Syndicate is 50,000*l.*, nearly all in ordinary shares, 34,000 of which are offered for subscription. According to the prospectus, the Syndicate is formed for the purpose of working and acquiring the British patents of Dr. Selle for photography in natural colours. The numbers and dates of those patents are not quoted—an omission which we are sure could not escape the notice of the most callow student of company literature. Moreover, beyond some vague generalities as to the assumed profitable nature of the business to be done, the prospectus is quite innocent of figures or data upon which an estimate of income and expenditure could be based.

WE are told "that during the past half-century numerous scientists have been engaged in endeavouring to discover the art of photography in natural colours. As far back as 1848 Becquerel gave his attention to the subject, and subsequently several others achieved further progress. Still more recently, Lippmann, Ives, Macdonough, Anderson, and Jolly (*sic*) applied their energies to the same object." Then follows the remark that "the results were either mere curiosities or only very imperfect products"—a pronouncement which may be characterised as a partial inaccuracy. The experiments of Dr. Selle appear to have occupied him five years, and quotations eulogistic of his results are taken from about twenty foreign newspapers, not one of which makes it evident to us that it understood what it was writing about. A German and an English lithographer certify to having tested the process.

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IT is deducible from the lengthy dissertation in which the prospectus indulges as to the many commercial applications of the process that the Naturograph, as it is called, is simply another name for three-colour block printing. But no hint whatever is given as to the precise nature of Dr. Selle's remarkable "invention" in connexion with it. Still, we notice among the names of the directors that of Mr. R. B. Roxby, who is the vendor. Mr. Roxby, we may tell our readers, was the author of a paper "adapted from communications from Dr. Neuhaus," entitled "On Dr. Selle's Process of Photography in Natural Colours," which was read before the Royal Photographic Society on December 8, 1896. To that paper, therefore, we naturally turn for assistance in our difficulty, and what do we find? Simply that Dr. Selle's "remarkable invention" consists in the adaptation of the three-colour process to glass positives by the superposition of stained films, a process, as we remarked exactly a year ago, that is, figuratively speaking, as old as the hills.

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BUT this is not all. Mr. Roxby's paper tells us that "a development of the process fraught with great economical importance is its application to colour printing. The printing is done either by heliography, lithography, or letterpress printing, at much less cost than that of any other process now known. In heliography the negatives are transferred to gelatine blocks, from which 2000 to 3000 impressions can be taken, and the result is little, if at all inferior to the photo-

graphs, although the velvety softness of the latter is to a certain extent lost." Here we have a choice of three methods of tri-colour printing, two of which have not yet been proved to be commercially practicable. The reasonable deduction, therefore, appears to be that typographic block work in colours is the basis or the substance of Dr. Selle's remarkable invention. What the doctor has invented, and in what respects his invention is remarkable, Mr. Roxby does not disclose. We said in our first paragraph that the prospectus does not particularise Dr. Selle's patents. We will endeavour to supply the omission. At page 832 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897 is printed Dr. Selle's patent for the production of photographs in natural colours by the superposition of coloured films. We shall not discuss the probable value of that patent; but we will own to a feeling of surprise that, if it is the patent referred to in the prospectus, that document should remain entirely silent as to what experts in colour photography and patent law think of its claim to be regarded as a "new invention."

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AN American contemporary quotes the following case as illustrative of the valuable part played, as a witness in a disputable case, by photography. The suit was brought by a young Greek girl, in one of the New York courts against the Metropolitan Street Railway Company. The suit for damages was based upon an accident which occurred to the plaintiff on one of the cars of the defendant's company, the plaintiff claiming that, as a result of the injuries, she had been practically helpless ever since. In the course of the trial, however, two photographs were produced, each made since the date of the accident, in one of which the plaintiff was shown in a boat, on the lake in Central Park, holding the oars as if in the act of rowing, and in the other was pictured as hanging clothes on a line, in the rear of the house in which her mother lived. These photographs led to cross-questioning, which developed the fact that she had also made many pleasure excursions during the preceding months, which facts, when brought to the notice of her attorney, caused him to withdraw from the case.

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WE are glad to learn that applications for space at next year's Crystal Palace Photographic Exhibition have so far been gratifyingly numerous. The Committee have now let over two-thirds of the available space in the Apparatus and Material Sections, and have only some two or three thousand square feet left. Many of the large firms have taken blocks of 400 square feet and upwards, and where this is the case the Committee are isolating their stalls from the others by a passage all round. The prospectus for the picture show was sent out to India and the colonies last week, and will be issued in England and Europe generally early in January. The loan collections are also well in hand. Many of the historical and other exhibits have already been received, and others are being arranged for almost daily. Early and obsolete types of lenses are badly wanted, as are also large Daguerreotypes. Doubtless, those of our readers who are possessed of such relics will be glad of the opportunity of lending them for exhibition. All communications relating to the Exhibition should be addressed to Mr. Child Bayley, at the offices of the Royal Photographic Society, 12, Hanover-square, W.

PROFESSOR GABRIEL LIPPMANN will read a paper on "Colour Photography" at the next ordinary meeting of the Royal Photographic Society on Tuesday, December 14, at 8 o'clock. This meeting will not be held at the Society's rooms in Hanover-square, but in the theatre of the Society of Arts, John-street, Adelphi, W.C. Non-members of the Royal Photographic Society will require admission tickets, which can be obtained on application at 12, Hanover-square.

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AN inquiry has reached us, in reference to the National Photographic Record Association, particularly as to whether now that the Association has started operations, a curator has been appointed to receive and take charge of contributions of prints, &c. So far as we can learn, nothing has yet been done in the matter, although we are informed that it is contemplated to appoint a British Museum official to the post. It has, however, been represented to us that the curator of the Association should be more in touch with the photographic world than a Museum official is likely to be, and the name of a gentleman has this week been suggested to us by a correspondent as having the necessary time and qualifications for the post.

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WE are informed that Messrs. George Houghton & Son, of 89, High Holborn, are publishing a series of 8 × 6 views, taken by Mr. G. E. Houghton, of Margate, before, during, and after the great gale of last week, also of the life-boats and the survivors of *The Friend of all Nations*.

THE GUM-BICHROMATE PROCESS

I.

THE crowded state of the meeting room of the Photographic Club, last week, when Mr. James Packham read a paper on, and demonstrated the working of, the gum-bichromate process, was ample testimony to the interest being taken just now in the resuscitated carbon process of the late Mr. John Pouncy, of forty years ago. It is by no means surprising that, in the after discussion, regret was expressed that so little credit is being given to the late Mr. Pouncy for his process. Reference was also made to the ridiculous and entirely misleading title that has been attempted to be given to the process, namely "photo-aquatint;" we say misleading, because any one purchasing a pamphlet now being exploited under this title would naturally, from the name, expect to get a treatise on the present system of photogravure.

Every one who has a knowledge of the fine arts or engraving, is quite aware that aquatint is a system of intaglio engraving on copper plates; but we fully acquit the sponsor for the name of "photo-aquatint" of this knowledge, or they would not have used it in connexion with Pouncy's process.

Aquatint engraving—seldom practised now—is this: a polished copper plate is dusted over with powdered bitumen or resin, sometimes a mixture of the two, and heated, just as in the case of a plate for modern photogravure. The design is then transferred from paper to the plate, and the aquatinter proceeds to stop off, first, all the high lights with a resistant varnish. The plate is then lightly bitten in with an etching solution. It is then washed and dried; next the lights and middle tints are stopped off with the varnish, and the plate

gain etched, these proceedings being repeated again and gain until the shadows are reached and completed. It will ow be seen that aquatint is quite analogous to the modern hotogravure process, in the latter the varying thickness of ıe gelatine resist simply taking the places of the successive toppings out in the original aquatint process. It will here be een how utterly misleading is the term "photo-aquatint" when applied to Pouncy's carbon process. It will be interesting just now to say a few words on the history of this process.

At the January (1859) meeting of the Photographic Society—ıow the Royal Photographic Society—the late Mr. John Pouncy ead a paper on his process, which paper will be found on page 123 of the Society's journal for that year. After speaking of the paper most suitable, and that was similar to some of that used the other night, Mr. Pouncy described how it should be coated with the mixture of a solution of gum arabic, vegetable black, and bichromate of potash, the proportions being given. The instructions were these :—

"Now apply the prepared solution in the following manner : Lay the paper, face uppermost, on a glass slab, or a very level and smooth board ; the glass is the best of the two. Commence coating freely with a broad camel's-hair brush, laying on a copious supply over the whole surface, and then allow the paper to absorb for about a couple of minutes ; this done, remove the superfluous liquid thus : take a painter's four-inch hog's-hair 'softener,' and work it regularly over the paper, with an alternate vertical and horizontal motion, until the whole presents a smooth, even surface, partially dry. The drying may then be completed by the fire." Then follow directions for the exposure and then for the development. "On removal from the pressure frame, lay the print, face downwards, in a flat dish of clean water, taking care to exclude all air bubbles. . . . The time of soaking may be roughly stated at five or six hours," &c. Finally, the picture is "washed under a stream of clean water from a tap or lip cup.' In certain cases the use of a camel's-hair brush is recommended for assisting the development. It will now be seen that the "gum-bichromate" process of to-day is identical with Pouncy's carbon process as described by him before the Photographic Society in 1859, and that to him is due the credit for it.

In the course of the discussion at the Club the other evening it was said that there was a difference in the two processes, inasmuch as now the paper is recommended to be sensitised before the pigmented gum is applied, and that this is a new idea and possesses some advantages. Is it new, however ? We have an impression that Pouncy did, at times, proceed in that way, and that it had been referred to in some of the late Mr. Sutton's writings. Be that as it may, there is no novelty whatever in this way of procedure. In the letter in our issue of October 22 a correspondent (Mr. Lewis, a very old hand) mentions that he has habitually worked in that way. Hence it is clear that there is no novelty whatever in this method of working as is now being claimed for it. Whether it really possesses any advantages over applying the bichromate together with the pigmented gum is quite another matter. It certainly involves double work and two separate dryings, but that is of little moment when the best results are the chief consideration. But, unless there is a distinct gain in this direction, "the game is not worth the candle."

Some pictures by the late Mr. Pouncy, made in 1858 and lent by his son, Mr. W. Pouncy, to the late Historical Exhibition at the Crystal Palace, were excellent, and are not surpassed by anything done now by the process. Indeed, the other evening Mr. Packham characterised them as being very beautiful productions. The whites of these pictures were clean, and the shadows deep and rich, while the half-tones were excellent. Whether the paper was sensitised before the colouring matter was applied or not, we cannot say.

Mr. Packham's very explicit paper will be of great service to workers and experimentalists with the process, and his practical demonstration of its working exemplifies that, in the hands of an experienced worker such as Mr. Packham is, the process is capable of yielding really excellent results, and totally different from the majority of the things that have been exhibited at the different Salon shows, also that the latter in no way illustrate the capabilities of Pouncy's process.

Ferrous Sulphite as a Developer.—A few weeks back (October 22, p. 676) we mentioned ferrous sulphite as a possible developer for bromide prints when warm tones are desired by development alone, and gave a formula, or a method, by which a developing solution may be made ; but, from a letter received from a correspondent, who has endeavoured to follow the instructions given, it appears they have not been as clear as we thought we had made them. Ferrous sulphite is itself but slightly soluble in water, though it is freely soluble in aqueous sulphurous acid, and the solution thus formed acts as an energetic developer, though at the same time well under control. The salt is produced, though not in a pure state, by the evaporation *in vacuo* of a solution of iron in aqueous sulphurous acid, or it may be obtained tolerably pure by precipitation with alcohol, being in the one case in pale green crystals, and, in the other, a nearly white powder. It changes rather quickly, especially in the presence of moisture, into sulphate, and should therefore be prepared as required.

It may also be made by the decomposition of freshly precipitated ferrous carbonate by means of sulphurous acid, and this, though a somewhat troublesome process, is the one we gave as being the most generally useful. On mixing concentrated solutions of sulphate of iron and carbonate of soda in equivalent proportions, a greyish-white gelatinous mass is formed, which, however, on exposure to the air, quickly turns dark green and eventually foxy red by oxidation; it therefore necessitates immediate handling. It is practically impossible to wash the gelatinous mass in the ordinary way of treating precipitates, and the most that can be done is to squeeze it in a linen cloth in order to extract as much as possible of the water, and with it the sulphate of soda formed by double decomposition. But this is at best a messy job, and occupies time in which the process of oxidation is proceeding, for which reason we recommended the jelly as first formed to be subjected without further treatment to the action of sulphurous acid passed into it in the form of gas. If the aqueous acid be employed, containing as it does such a comparatively small proportion of SO_2, the final solution would be too dilute to be of much use as a developer ; but, by passing the freshly formed gas into the jelly, a solution of good strength may be prepared. It seems, however, that our instructions have not been sufficiently definite as to when the operation is complete, for our correspondent, it appears, stopped the process when the mass became "perfectly liquid," filtered, and obtained a yellowish solution, that proved to be neutral and to possess absolutely no developing power. The process, as a matter of fact, was only half complete, the insoluble sulphite of iron having been formed ; and, as this was filtered out, clearly there could be no developing power in the filtrate.

The passage of the gas through the liquid should be continued until it becomes a clear solution. Then the whole of the sulphite may be considered to be in an active condition, though in the pre-

sence of a large excess of free acid, and with the additional restraining influence of the sulphate of soda formed in the first reaction. The latter may be got rid of, and possibly with advantage, by filtering, as did our correspondent, as soon as the change to sulphite has taken place, mixing the latter with a fresh quantity of water and continuing the passage of the gas through this new mixture. But it is difficult to judge precisely when the conversion is complete, though it may be guessed at with sufficient accuracy to secure the removal of the useless or restraining sulphate of soda without much loss of the iron salt. It is probable, too, that in this manner a more concentrated solution will be obtainable. It seems to us also that, if the filtration method be adopted, an easier plan of finishing the process will be to treat the precipitate collected on the filter with aqueous sulphurous acid added gradually until it is just dissolved.

A Possible Iron and Silver Intensifier for Gelatine Plates.—In the same article in which the sulphate of iron developer was mentioned allusion was made to the possible application of ferrous tartrate as a combined physical and chemical developer, as first suggested by the late Mr. Carey Lea. Ferrous salts, in the presence of tartaric acid, are not precipitated by alkalies, hence it follows that ferrous tartrate may be rendered alkaline, and in this condition it exhibits developing power when applied to a bromide film. In the acid condition it possesses a similar reducing power to the sulphate and other ferrous salts upon nitrate of silver, and thus plays the part of a physical developer, but it does not appear to be a very feasible operation to combine these two functions. Ferrous tartrate is formed by the mixture of a normal tartrate as of ammonia with ferrous sulphate as an insoluble precipitate which, however, dissolves readily in ammonia, and this solution—or even a mixture of tartaric acid and ferrous sulphite rendered alkaline with ammonia—possesses developing powers, though of little value so far as we have ascertained owing to the strong tendency to general reduction. It may be a useful developer if a suitable restrainer can be found, but so far we have not succeeded in that search. It has occurred to us that this excessive energy may possibly prove actually useful if applied as an intensifier in conjunction with a silver salt, on the same principle as Mr. J. B. B. Wellington's sulphocyanide intensifier, the difficulty with which seems to be to get fairly rapid action except with very strong solutions both of pyro and of silver. Possibly ferrous tartrate may remove that difficulty, while the absence of unreduced bromide on the fixed plate will deprive it of its opportunity of abnormal reduction.

Naming or Titling Negatives.—*Apropos* of the formula recently given for a transfer ink for the purpose of naming negatives, it has been suggested to us that the mercurial salts included are rather apt to prove dangerous substances to introduce into the negative film in conjunction with hygroscopic matter. There is the chance—a remote one perhaps, it is pointed out—of the mixture spreading on the film itself, but more probably of its "setting off" on the print, and thence being transferred to the washing and toning baths. If a chemical substance must be used, it is suggested that a less dangerous one would be chloride of copper, a few crystals of which, added to the glycerine mixture, would effect the same purpose, and be comparatively harmless if it got into the wash water. But preferable even to this is the very old plan which consists in omitting the chemical element altogether, and dusting over the "transfer" in plain sugar and glycerine with finely powdered plumbago or other pigment.

The Aerial Graphoscope.—With regard to the aerial graphoscope which has recently been prominently before the public, we are asked by a correspondent whether it is supposed to be a new invention, or whether it is acknowledged to be a revival of a comparatively ancient idea; "because" says our correspondent, "I remember some ten or twelve, perhaps more, years ago, precisely the same thing, a rapidly revolving lath painted white, was used f precisely the same purpose, by, I think, Professor Boys, and w exhibited as a sort of side show at the annual *soirée* of the Roy Society or Royal Institution. It was, I believe, mentioned in t JOURNAL at the time, and I very well recollect hearing it describ at the Photographic Club."

JOTTINGS.

MR. JAMES PACKHAM's demonstration of the method of prepari bichromated gum paper and the development of the image w witnessed by a large and representative audience at the Photograph Club, on Wednesday, December 1. The paper that preceded t demonstration was an excellent one, and will, doubtless, be ve widely read. It was so instructive to watch Mr. Packham mixi the colloid and pigment, coating the paper, and "developing" t picture, that one not only realised that he had devoted a great deal time to the special and peculiar manipulations required by t process, but also felt sorry that those persons at a distance, who m be led to experiment with this system of printing, could not al have the opportunity of seeing Mr. Packham at work—quite a lit education in itself. He deserves to be thanked in a special mann for his labours, for, although apparently an "Affiliation" lectu the fee for which is 5*l.* 5*s.*—a princely price to pay for some of t feeble and vamped-up rubbish which the Affiliation has inflict upon its contributing societies during the last year or so—M Packham preferred to have his work published broadcast for t general benefit, and declined to make money out of it.

There was some discussion as to the application of the nam "photo-aquatint" to the process—a gross misnomer, as th JOURNAL pointed out many months ago. The name figures on t title-page of a little book by Messrs. Maskell and Demachy, whi deals with the history, theory, and practical details of the process a picturesque and imaginative style. Thus, on page 4, we are to that, "until quite recently, the quality desired by all photographe alike, whether for scientific or for pictorial purposes, was a printi medium which should reproduce in its minutest details, and wi the greatest fidelity to the varying degrees of gradation, a counte part or positive image of the negative. *There was no distincti made between work which was intended for scientific exactness a that which aimed at artistic ends* (sic)." [My italics.]

Now, what do Mr. Maskell and Mr. Demachy mean by "qu recently?" The context tells us. The cold-bath platinum-printi process restrained by glycerine was the alleged beginning of th new era. Mr. Willis first showed what could be done by the stayi action of glycerine in 1892. Here, therefore, we have a defini date to go by. I cannot tell how far back Mr. Demachy's knowled of photography goes, but Mr. Maskell errs in making such a stat ment as the one I have quoted, for, in the years 1885–1888, D P. H. Emerson produced and exhibited photographs on rough surfaced platinum papers, which fully demonstrated the artisti possibilities of the process, were not "faked," and, judged from an standpoint whatsoever, have not been excelled by any of the wor since shown at the Salon. Of all men, I say, it is to Emerson tha photographers are indebted, years before the date given by M Maskell and Mr. Demachy, for practically emphasising "the distinc tion between work intended for scientific exactness and tha which aims at artistic ends."

But, to return to this book. On page 9, Messrs. Rouille-Ladevèz Maskell, and Demachy are given credit for being "the first" t exhibit bichromated-gum pictures in 1894. Wrong again. Result by the process were publicly shown at one of the foreign exhibition at Earl's Court in the eighties, my authority being a gentleman wh saw them and copied the formula appended to them. As to th final chapter of the book, in which credit is claimed by Mr. Maskel for discovering the principle of pre-sensitising the paper itsel

stead of the pigmented colloid, THE BRITISH JOURNAL OF PHOTOGRAPHY is a witness to the fact that this idea was put into practice any years ago. But what of the value of the practical part of the ook? This may be easily gauged from such statements as that "two imblesful of gum added to the bichromate and pigment" (quantity t stated) "will easily cover a whole sheet of drawing-paper" ize not stated); while, when it is understood that many pages are voted to a querulous defence of "photo-faking," an attack on "meanism," an advertisement of the Salon, and other irrelevant things, will be seen that, in order to make it as useful and reliable as it ght to be, the conscientious editing of a second edition of the ook, should it be called for, would be no sinecure.

Enough, however, of this amusing little volume. I shall watch ith interest the progress of the process in this country. Mr. askell and others do quite right to lay stress on the fact that the ersonal equation dominates the bichromated-gum method of printg. You have to prepare your own paper, and the latitude given ou by brush development allows you absolute control over the ualitative character of the results. Mr. Demachy and one or two ther Continental workers have certainly shown some pictorially eautiful results in pigmented gum; but, if the truth were known, hese gentlemen are artists—artists, I mean, by instinct, training, nd occupation. The bichromated-gum pictures so far produced by English workers have been ludicrously bad; but, of course, among English photographers there are few artists; consequently to talk of he freedom of individuality of treatment which the process allows is nly to prepare us for the production of a considerable number of nsuccessful results, and therefore ghastly horrors, supplemented by he juvenile imbecilities of the enthusiastic amateur lured on by what he reads to attempt a process at which the ablest photographers in the world could easily break down.

For small work, no matter of what kind, I do not think the process will have much vogue. The trouble, the risk, and the uncertainty will be against it. My idea is that for large portraits, or direct subjects of such dimensions as admit of very broad treatment it would show to most advantage in skilful hands. This is not an off-hand opinion, but one formed by a careful study of pictures by the process long before it began to respond to the efforts now being made to boom it. Extreme coarseness of texture, or rather deposit, in small work is, as a rule, intolerable, for obvious reasons, a fact which must militate against the bichromate-gum process, except for large subjects. And may I, at the risk of unnecessarily intruding my own opinion into this subject, and entirely for the benefit of my readers at a distance, make the remark that the *best* results by the bichromate-gum process yet shown in this country could be undoubtedly equalled by a skilful hand at ordinary carbon printing on a rough-paper support?

From the point of view of pure photography, the chief objection to the gum process is the ready means it affords of *destroying* the photographic quality and character of your results. You forcibly dissolve out what you like, or, rather, what you don't like, and then you call the bastardised result a photograph, *i.e.*, a drawing by light! Clearly a new and distinct name for these productions is imperatively demanded, and to my mind nothing is more suited than the term "photofakograph," which conveys an idea of their innate falsity. "Fake" is defined by Webster as "a trick, a swindle," and is called a slang term.

There are many self-confessed photo-fakers among us, and those hermaphroditic persons do not seem conscious of the uncomfortable position into which their vanity and conceit have led them. But it is, nevertheless, clear that photographers disown and despise them, and that artists and art critics treat them with amused contempt. This is the kind of person to whom the bichromated-gum process peculiarly appeals, for it gives the photofaker an opportunity of thinking that he is a photographer and an artist, and demonstrating that he is neither.

COSMOS.

THE GUM-BICHROMATE PROCESS.

[Paper read before the Photographic Club.]

ALTHOUGH this method of printing was introduced nearly half a century since, it was not much followed until the last year or two. It has been unmercifully condemned by many eminent photographers, and even by some who claim to favour a tendency towards broad and effective results. On the other hand, some who are equally eminent have adopted it with every satisfaction, and there are many more who are anxious to ascertain all that can be gleaned as to its manipulation.

However, it must be understood that, while it is one of the most ductile of processes, it is, perhaps, one of the most difficult, and I would advise none but the careful and painstaking operator to adopt its use, as it will demand the utmost skill to arrive at any high degree of success; but, should one desire to establish a pronounced individuality, there is no other method so amenable to the personal will.

It is not my intention to champion the process, or to advocate its adoption to the exclusion of other methods of printing. I am here, by special desire, to bring to your notice a series of carefully conducted experiments; or, rather, to explain how the few results I have here have been secured. These investigations have been conducted with a view to arriving at the conditions under which a combination of bichromated gum and pigment, or pigments, may be expected to give the best results. Yet I think I may, with every consistency, be allowed to say that it is a process which produces indisputably permanent work, which is in itself a great recommendation.

THEORY OF THE GUM PROCESS.

The pure and simple gum-bichromate process must not be confused with any other chromic method. It is not the same as the papier velours of Artigue; although the latter is a direct-printing pigmented process, it is materially different to the process under consideration. With Artigue, the essential result of the method depends upon the purity of the whites.

This is secured by the solubility of a substratum, apparently consisting of a combination of gelatine, &c.

With the gum-bichromate method, it is sometimes equally desirable to obtain pure whites, yet no protecting medium is especially provided. No doubt some such action does take place, otherwise the paper would be degraded in the high lights by the superimposed pigment creeping into the minute interstices between the fibrous composition of the paper, and we may presume this is, in a great measure, avoided by the latest method of preparing the paper—by saturating it with the strongest possible solution of the chromic salt. The cellular, capillary tissues of the fibres of the paper are filled, presumably, with a crystalline formation of the salt, and, when the pigmented gum mucilage is applied, these crystals form a kind of obstructive fortification against the entrance of the colour into the minute structural recesses of the paper; this is further assisted by the fact that the gum mucilage is of such specific consistency as shall hold the pigment in suspension, and is, at the same time, not of sufficient fluidity to easily dissolve and replace the bichromate salt. The atoms of fine pigment, being surrounded by this mucilaginous substance, are, in a manner, insulated, and do not actually come into contact with the paper until after development.

By the effect of light on this sensitised mixture, as with other organic chromated substances, a certain portion of the gum is rendered more or less insoluble; this is dependent upon the time of exposure, the intensity of the light, the thickness of the pigmented coating, and the character of the negative. On development, such of the pigmented gum as has not been rendered insoluble is dissolved out, leaving on the surface of the paper gradations of the pigment in proportion to the solubility of the coating.

PAPERS SUITABLE FOR THE PROCESS.

For the practical working of the process, the first considerations are the selection of a suitable paper, the character of the subject, and the effect desired.

There are numerous kinds of paper at our command, all of which give varying results. Most papers that absorb the bichromated solution, and are of a deep orange tint when dry, may be relied on to work efficiently, if they are not absorbent, and do not allow the pigmented gum to become too intimately associated with their fibres. Where softness and not too brilliant high lights are desired, however, a certain amount of absorption of colour is sometimes an advantage. Those papers which are heavily sized, especially if with gelatine or starch, give purer whites, much detail, and a tendency to hardness. These opposite qualities are the mediums by which the varying and charming results of this ductile process are obtained.

The following are a few of the more easily worked papers, a selection of which will give a wide range of effect. They are easily procurable from most artists' colourmen, and are not expensive.

Michallett paper is a fairly heavy paper, of the kind known as "laid," with distinctive markings. It is rather coarse in texture, with a series of fine lines running in one direction, set closely together; another set of lines—much wider apart and very distinct (almost inconveniently so)—run at right angles to these. But, altogether, it is an easily worked paper, readily absorbing the bichromated solution, and taking an even and thin coating of the pigmented gum.

Allongé is a rather heavy paper, apparently of the kind known as "wove," without water markings. This paper has one side which is of a delightfully fine and even grain, and is in every way adapted for this process.

Lallane is a much lighter paper, partaking somewhat of the character of Michallett, but much more delicate in its markings.

English cartridge paper works wells, and has also on one side a semi-fine grain, similar to allongé, but, as it is rather heavily sized, the resulting prints tend to hardness, although good and clear high lights are obtainable.

Whatman's papers give excellent results, and the coarser kinds are well adapted for very broad effects.

With the advantages securable by the proper chromatising of the paper, there are now a host of others that are equally well adapted for this description of work. Fine, glazed-surface papers are difficult to manipulate, but, when skill has been acquired, they can be advantageously employed in some cases. It will be found that most of the papers used for water-colour drawings have two distinct surfaces, which are open to selection, the toothed or grained side being the one on which it is the more convenient to work.

Sensitising the Paper.

Having selected a suitable paper, we may now proceed to sensitise it, or, in other words, completely saturate it with a solution of bichromate of potassium. This solution must be of the strength of one part of the salt dissolved in ten parts of water. The saturation must also be complete, and it is most conveniently accomplished if the paper be worked into quarter sheets. It is advisable, before cutting it into quarters, to mark each corner of the full-sized sheet on the opposite side to that which is intended to be worked upon, so that corresponding surfaces may be easily distinguished at the time of coating.

The solution of bichromate, being so nearly saturated, has a tendency to crystallise out in the stock bottle. When such is the case, it is advisable to raise the temperature of the soluble portion and redissolve the crystals therein. It will be found that all papers, especially those which are heavily sized, are more evenly saturated if the operation is carried out at a temperature of from 60° to 70° Fahr.

Two minutes have been given as the required period for steeping the paper, but this is not at all times sufficient, because, if the solution does not evenly and thoroughly permeate the paper, it will be unevenly absorbed during the time of drying, or uneven printing will result.

Having decided how many quarter sheets you propose to sensitise, pour into an ordinary deep developing dish sufficient bichromate solution to cover the whole of them. Then take each sheet separately and immerse it below the surface, carefully removing all air bells; turn over and do the same with the reverse side. Mark the first sheet distinctly on the back to distinguish it as the first to be immersed, and leave the marked side uppermost. Go on working in the same manner until you have immersed all you intend to sensitise. Then proceed to remove the bottom sheet to the top, at the same time examining it to see there are no air bells remaining. Continue this proceeding until the whole of the paper is completely saturated and the first sheet immersed is at the top. Now raise each sheet slowly by one corner, and very gradually remove it from the solution. This will free it from all superfluous liquid. The paper is now pinned by one corner to a shelf, or hung on a line to dry, one corner downward, there being attached to the lower corner an inch or two of bibulous paper by its own adhesion.

The drying must be completed in darkness or yellow light, and from now the paper must be carefully shielded from actinic light and from dampness.

Paper thus prepared can be kept for a considerable time, unless it be heavily sized. The deterioration of prepared paper is recognised by its change of colour from a bright yellow or orange to a dirty-greenish brown.

There are other means of using the bichromatic salt, which will be explained later.

The Gum Mucilage and Pigment.

The next procedure will be the consideration of the gum mucilage we shall employ. There are several kinds of gum, but only one description appears to be adapted to this process with any certainty of success. This is the Soudan gum acacia, known as Turkey, and it should be purchased in tears, never in powder. Dissolve this for a stock solution in the proportion of four parts gum to ten of cold water. If broken in small pieces, it will, if occasionally stirred, all be melted in one evening. Strain out the woody impurities through fine muslin, and allow other to subside in the stock bottle. A convenient quantity to work with is two ounces of gum dissolved in five fluid ounces of water. This should be well corked in a rather wide-mouthed bottle.

Thus far we have sensitised our paper and prepared our mucilage. We have now to select and combine our pigment, and to coat the paper with the resulting mixture. These two processes appear to have been the difficulties over which many who have attempted to work in gum-bichromate have stumbled. But there is no reason why the difficulty should exist. It is merely a matter of a little technical skill and strict adherence to uniformity of working with constantly known quantities. I would advise that none but dry colours be employed. They are easily handled, and you then always know the characteristic behaviour of your colloid. So many and various are the mediums in which the tube and other water colours are prepared that, when using them, the results are uncertain, and it is also difficult to work with accurate proportion of pigment when in the form of paste or cake.

A useful selection of powdered pigments will be vegetable black, red and yellow ochre, burnt sienna, and burnt umber; with these any combination tint may be made up.

It is advisable always to work with accurately weighed and measured quantities, and to book your various formulæ. You will also find a great convenience to number each combination, taking a piece of coated paper, printing a portion of it, and developing it, leaving about half of it plain white, upon which to note the number of the formulæ or other valuable particulars. By so doing you can at any time produce duplicates in the exact colour, or make such alterations as are advisable.

To combine the gum and pigment, take half a fluid ounce of four to ten gum mucilage, to which add half a fluid ounce of water, reducing the strength to two of gum in ten of water. Thoroughly mix this. I will explain later why I keep the mucilage of double strength.

Weigh out twelve grains of vegetable black, and place upon a marble slab or plate of ground plass; about twelve inches by twelve inches is a convenient size. Upon the small pile of pigment drop a few drops of the mucilage, and, with a palette-knife, carefully grind and regrind the mixture until it is is in the finest possible condition. This will occupy about five or ten minutes, and much of the range of scale in the gradation of your print is dependent on this operation. Take this up with your palette knife, and transfer to an old teacup, and pour more of the gum mucilage upon the slab. With a little practice this may be made to completely clean it free of all the remaining pigment, which is now added to that already in the cup, upon which pour the remaining portion of gum, and work it well up with your coating brush.

Coating the Paper.

The coating brush most convenient for use is of the kind known as a two-inch bear's-hair set in tin.

To coat the paper, place upon a drawing board of soft pine wood a sheet of demy size, thick blotting-paper, in two thicknesses. Upon this pin down at each corner a quarter sheet of your already bichromated paper, which must previously be made absolutely "bone" dry, with the side you have previously marked downward. Do not drive your drawing pins home. Mix your pigment and gum mucilage again by repeatedly filling your brush and scraping the colour out on the side of the cup. Take a fairly full brush of colour and spread it evenly over the paper, crossing and recrossing it with the brush once or twice.

You will now find your paper has expanded considerably. Remove the drawing pins singly, stretching the paper slightly; as you repin each corner down again, you will have an even, level surface. Now take a four-inch flat, badger's-hair brush, known as the artists' "softener." Hold this brush vertically by the two fingers and the thumb, about an inch and a half from the top of the handle, and proceed to pass it over the surface of your paper as quickly as possible, again and again, until it is nearly dry and absolutely and evenly coated with a thin, semi-transparent coating of the pigmented gum. It is impossible to describe the peculi

tion which spreads the mixture in the best possible way. It is entirely wrist action, not very gentle nor yet very heavy. The brush is not used over the paper in the usual manner; it is a kind of hop-skip-and-jump motion, with the fiddler's rapidity of action when he is executing semi-semi-demi-quavers, and and can only be acquired by practice, but is very effectual in obtaining absolute uniformity.

Undoubtedly many failures have been the result of the employment of too much pigment. It is remarkable how little is required. I have secured admirable results with seven grains of vegetable black mixed with one fluid ounce of the diluted mucilage, and I seldom, even when the most dense shadows are required, use more than double this quantity. As previously stated, every degree of tint can be obtained by a mixture of the before-named colours. The ochres and umbers, sepia and siennas, must be used in quantities ranging from thirty-five to forty and even fifty grains to the fluid ounce of gum.

To test if the paper has been correctly coated, cut off a small piece, dry it, and float it, face side downwards, upon cold water. The pigmented mucilage should all freely drop from the surface, or, if not quite clean, should become so with a very slight laving with water, or with the slightest touch of a camel's-hair brush.

The paper, after coating, is best allowed to dry spontaneously; but, if it is intended to be kept for a few days, it must be thoroughly dried by a gentle heat before being placed in the portfolio.

Referring to my observation on keeping the gum mucilage in double the strength required for using, in the first place it keeps much better in the concentrated form, and, again, it is sometimes useful for working by the old method, *i.e.*, to mix half a fluid ounce of the strong mucilage with half a fluid ounce of one in ten bichromate solution, and coat any of the papers plain without previous sensitisation with this, after having mixed it with the desired pigment.

Exposure and Development.

Exposure, as previously explained, depends greatly upon the intensity of the light. The printing should be done in bright, diffused light, but not sunlight; and, as a rule, two to three gradations of a Burton's actinometer will be found sufficient upon not too heavily coated paper, employing the back or yellow side of a strip of the actual paper you are printing upon as an indicating medium. Red-toned pigments and browns require more exposure than blacks. Nothing but actual practical experience can teach the exact extent to which it is to be carried. The exposure also be considered complete when the principal shadows are fairly evident to transmitted light. Over-exposure gives softness, and, if carried too far, completely obscures the half-tones and high lights. With under-exposure the semi-tints are completely soluble.

Development is not a difficult process, but it is open to great latitude of treatment. Place the exposed print face downwards upon a deep dish of cold water, and allow it to float in this manner for five or ten minutes, and then carefully raise one corner. By this time some idea as to what treatment will be required can generally be formed. If the mixture in the high lights and the half-tones has begun to move, the treatment must be very gentle. If none has been dissolved from the body of the print, and the unexposed margins have begun to move, you may consider you have full exposure. In the latter case, allow the print to still float face downwards for another five or ten minutes, or even more, occasionally changing the water, to wash out the bichromate stain. Do not allow the face of the print to touch the bottom of the dish, nor allow it to remain face uppermost, either in or out of the water, unless it be frequently rinsed, or you will possibly develop delightful stains that cannot be removed by any after-manipulation. If the printing exposure has been approximately correct, you should by this time know something about the general appearance of the print.

Remove it from the water and place it face upwards upon a thin board, somewhat larger than the print. Pin it with one drawing pin at the top to prevent accidents. If under-exposed, very gentle laving with water may remove all the soluble colour, but, if some parts still resist the gentle action of the water, take a large-sized camel's-hair mop, and gently touch those places, beginning upon the margins and foreground. Occasionally flow over the top edge of the print a plentiful quantity of clean water, to wash away the dissolved pigment.

The lighter parts of the print will now show up plainly, but the shadows will be still clogged. Deal very gently with the lighter portions, and work on such parts of the shadows and half-tones as may be considered necessary by gently stabbing with the mop brush. Keep the brush continually full of water, and allow a stream to flow occasionally over the whole face of the print. Should there have been clouds in your negative, by careful manipulation they may be preserved.

After treatment of the Print.

We may now presume you have something that may be somewhat like a picture, and now comes the time for those final operations which we are told are questionable photography; well, such treatment may or may not be photography pure and simple, but one must admit that upon the skilful application of the powers of "faking" at this stage depends greatly the making or the marring of all the previous work.

A touch here and a touch there will remove those portions of colour that may not be quite so soluble as other parts, working always by dabbing or stippling with various-sized camel's-hair brushes.

Sometimes the printing may be somewhat overdone in parts, and may require even more patience and power than can resonably be applied with the brush. If requisite, warmer water may be employed, but it is necessary to be very careful in its application, although it may be used with good effect even up to boiling point. At other times a jet of water, either from an enema syringe or from a tube fitted to the household service pipe, is very useful and this may be applied gently or with all the force obtainable. In fact, there is no limit to the amount of manipulation that may be utilised, though it must be done in exactly the right spot and in the right degree, for, if the colour be once removed, there is no possible means of legitimately replacing it.

After development to the fullest extent required, there still remains one other operation, if it is desired to clear the print entirely from the stain of the yellow bichromate. This is to pass it through a bleaching bath made up of alum, sulphite of soda, or even hyposulphite, strength being immaterial if the print be well washed for a few minutes after passing through the bath. If the prints have been weakly printed, a weak solution should be used, and one should be certain there is no acidity, and there should be no prolonged washing.

The prints must be allowed to dry spontaneously; do not attempt to apply blotting-paper.

James Packham, F.R.P.S.

THE APPLICATION OF THE THEORY OF COLOUR.

[Transactions of the Edinburgh Photographic Society.]

By colour we understand the visible impression conveyed to the brain through the eye by vibrations which, while forming component parts of ordinary white sunlight, differ individually in their action on the eye, and only produce the impression of white light when combined in certain proportions. Colour is made visible in several ways.

1. By the decomposition of white light by means of refraction, diffraction, or interference.
2. By the absorption by various substances of certain vibrations from white light, and the reflection or transmission of others, which form what we call the colour of the substance by reflected or transmitted light.
3. By the heating of a substance until it becomes self-luminous, emitting visible vibrations depending on its nature and the degree of heat applied.
4. By phosphorescence, a phenomenon shown by a number of substances, which emit visible vibrations in the dark after exposure to light.
5. By fluorescence, a property exhibited by a few substances which change into visible vibrations certain of the components of ordinary light which are otherwise invisible.

Whether the direct conversion of electricity into light has yet been proved, and falls to be added to the sources of colour, I do not know. In considering the applications of the theory of colour, our attention is practically confined to the first three sources enumerated—the direct decomposition of white light; the absorption of certain rays by many substances, which are hence called coloured; and the self-luminosity of heated substances.

The most generally known method of decomposing white light is by means of refraction in a prism. When a beam of sunlight from a narrow slit is allowed to pass through a prism, it is expanded by refraction into a coloured band, varying from red, the least refrangible visible rays, of greatest wave-length and smallest number of vibrations per second, to violet, the most refrangible of visible rays, of shortest wave-length and greatest number of vibrations. Beyond this visible band, at each end, are rays respectively of greater and less refrangibility invisible to the eye, and the whole forms the complete spectrum of solar light, which possesses the most intense interest for the physical investigator from its remarkable properties. With these, however, we are not concerned just now, as our attention must be confined to the visible spectrum as a revelation of colour, and the natural foundation on which all investigation of the properties of colour must be based.

It consists, then, as we all know, of an infinite number of colours, changing by imperceptible gradations, and in regular permanent order, from end to end. But, though the gradations are imperceptible, yet to the eye there are certain well-defined regions which have been universally accepted as standards, and have received the names of the seven colours

of the rainbow—red, orange, yellow, green, blue, indigo or violet blue, and violet. In the spectrum we see these colours in their greatest purity and intensity, and one cannot fail to be impressed with their marvellous beauty and brilliancy.

When a ray of white light falls on the surface of a material substance, it may be transmitted or reflected unchanged, or certain of its component colours may be transmitted or reflected, and the remainder absorbed, or it may be entirely absorbed. In the first case the substance is said to be white or colourless; in the last case it is said to be black; in the remaining instance it is said to possess colour, its particular colour being that formed by the whole of the component colours of white light which it has not absorbed. While the colour of a substance may be considered in one sense as its inherent property, it is, nevertheless, dependent entirely on the nature of the light which impinges on it, as, if the light is deficient in any of the rays which it reflects, its colour will be altered accordingly. For instance, a violet-coloured substance, which reflects only the violet rays, appears black in the light of burning sodium, which is pure yellow, and contains no violet rays. Again, if white light be transmitted through red glass, it is deprived of all its rays except the red, and, as red is absorbed by green substances, if a green glass is interposed, the light is entirely cut off.

The third source of colour we have mentioned is the self-luminosity of heated substances. Certain bodies, as they are heated, radiate energy in the form of invisible heat rays of small refrangibility beyond the red end of the spectrum, then gradually commence to emit the visible rays, beginning with the red, and passing, by the addition of the remaining colours, through orange and bright yellow up to complete white light. But this action is not universal. Some substances radiate nothing but invisible heat, while others display a selective power in the visible rays which they emit, and glow with a well-marked colour. And this colour is found to be the complementary to the ordinary colour of the substance; that is to say, the rays emitted by it when heated are the same as those it absorbs when cold. For instance, a piece of ruby-coloured glass, heated to incandescence, shows a greenish light when viewed in the dark.

I pass now from the consideration of the production of colour to direct your attention to some of its properties, and here it becomes necessary to explain the accepted theory of colour sensation.

Although the spectrum shows an infinite variety of different colours, all equally pure, it has been found that certain of these can be produced by the combination of others, which themselves cannot be so produced. These are considered to be fundamental or primary colours, and are three in number—red, green, and violet. Each of these appears to be present to some extent throughout the entire spectrum, reaching its point of maximum effect where the colour occurs commonly known by its name, and it seems doubtful on this account, and also for another reason which will be explained further on, whether we ever really see the actual primary colours, or indeed any colours, in perfect purity.

It is supposed that these fundamental colours act upon three distinct sets of nerves in the retina, each of which is sensitive only to rays between certain limits of rate of vibration and length of undulation, and that the impression of secondary or combined colours and of white light depends on the excitation of two or of all three sets of nerves in certain proportions. It follows from the theory of the three primary colours that, if these are combined in the proper proportions, white light will be produced, and this is found by experiment to be the case. By dividing a disc into three sectors, painted respectively red, green, and violet, and by rotating it rapidly, the impression of light grey or dirty white is produced. It does not appear pure white, partly because the pigments used are not quite pure, and mainly because of imperfect illumination, as the combined rays from the three sectors only produce as much white light as would illuminate one-third of the disc. It is impossible to produce pure white by combinations of coloured rays side by side; they must actually combine in the space occupied by a single ray. This is a point of the very greatest importance in the practical application of the theory of colour, and must be at the very root of all systems of colouring by the application of successive pigments.

If all the rays of the spectrum be divided into two parcels, one of these will contain exactly those required to form white light by combination with the other parcel. The two colours formed by the combined rays of either parcel are said to be complementary, or, in other words, the complementary of any particular colour is that colour which, combined with it, will produce white. Thus the primaries red and green combined form yellow, and the remaining primary, violet, is the complementary of yellow. Now, it is evident that complementary colours excite different sets of nerves, and a curious, though well known, optical illusion depends on this fact. If one gazes steadily for a short time at an object of any brilliant colour, it is found, on removing the gaze to a white surface, that an image of the object is seen, but of the complementary colour to its own. The generally accepted explanation of this is, that the nerves sensitive to the rays forming the colour of the object become fatigued, and hence do not respond to these same rays, which form part of the light reflected from the white surface. The nerves which have not been fatigued—that is to say, those sensitive to the complementary colour—receive the sensation of that colour in full, and hence that alone is perceived, until the other nerves recover from their fatigue, again become sensitive to their proper impressions, and the coloured image gradually fades away. If the gaze is directed to a coloured surface instead of white, an analogous effect is produced; the colour is changed by the addition of the complementary to the colour previously viewed. But not only is this the case, but, even while the eye is directed to a coloured object on a white ground, it is seen gradually to become surrounded by a faint band of the complementary colour. The cause of this appears to be as follows: We all know how difficult it is to gaze steadily for any time at one spot. The tendency of the eye is to be constantly in motion, wandering over a surface. It is really this involuntary movement which permits us to obtain a distinct image on the retina of anything more than a single point at a time. In looking, then, at a coloured object on a white ground, we tend to move our gaze over the surface of the object, and to cross its boundaries, and the moment we do this the complementary colour is developed. We find this phenomenon assume yet a third form. By merely closing or covering our eyes after they have been concentrated on a bright colour, we can produce an image in the complementary. In this case no light enters the eye from outside, so that we cannot consider the effect to be due to the abstraction of certain rays from white light, owing to fatigue of certain of the nerves. We are compelled to regard it as a proof that the excitation of one set of colour nerves sets up a feebler action in the others, in a manner somewhat analogous to the production of momentary currents of electricity in a conductor when the current in another conductor alongside is made and broken. This secondary action may be called the induced colour sensation, and there is good reason for supposing that it is always present in a greater or less degree, and this is one reason I had for saying, in speaking of the primary colours, that it is doubtful whether we see any colour in perfect purity. It seems quite possible that this is a wise provision of nature for the partial preservation of the eyes from excessive fatigue. There is no doubt that the introduction of a variety of colours, properly chosen and arranged, into decoration both internal and external, saves our eyes to a great extent from overstrain, as some of the nerves are resting while others are in use. The snow blindness of the Polar regions is probably due to the lack of this variety of colour.

It is obvious, from the effect of the action we have just described, that complementary colours, placed side by side, enhance each other's value by means of the induced sensations to which they give rise, and that the colour of any object may be purified and deepened by surrounding it with a field of its complementary colour. The practical application of this law, while commonly known, does not appear to be made use of as frequently as it might with advantage.

Some colour theorists have attempted to draw an analogy between harmony of colour and harmony of sounds, but it has been well pointed out that the pleasing effect of a good colour composition is comparable rather to melody than to harmony in music, because the eye does not view all the colours simultaneously, but successively. In fact, a pleasing colour effect may be produced by individual colours differing very slightly in their rates of vibration, while sounds of similar proportions produce the greatest discord. It appears, however, to be a principle, which should guide artists and decorators, that to produce the most pleasant and restful effect in a colour composition, its colours—however great a variety it may contain—should, on the whole, balance each other, so that, if mixed together and uniformly distributed, they would form a neutral grey, that is, white, imperfectly reflected.

I turn now for a few moments to consider the use of pigments in painting and colour painting. Pigments may be transparent or opaque, but in both kinds their mixtures produce results entirely different from combinations of light rays. This accounts for the prevalence of many erroneous ideas on the subject of primary colours. The nature of the colour reflected by mixtures of pigments is easily understood when we consider that they are produced by the abstraction of some of the rays from white light. Take, as an instance, the well-known mixture of yellow and blue to produce green. The yellow and blue rays of the spectrum mixed produce nearly white. But the yellow pigment reflects red and green, and absorbs violet. The blue reflects green and violet, and absorbs red. When mixed together or superposed, therefore, the yellow pigment absorbs the violet rays reflected by the blue, the blue pigment absorbs the red rays reflected by the yellow, and instead of white only the residual colour green is left, which is reflected by both. If we add crimson to the mixture, the green is also absorbed, and a neutral colour almost black results.

This principle forms the basis of the photo-trichromatic printing process, which is now well known. Photographs are taken through three screens, each of which shuts off two of the primary colours, allowing the third to act. Three negatives are thus obtained, each acted upon by one primary sensation. Consider one of these—say that of red. Every part of this negative which is not acted upon evidently contains no red rays. It may, therefore, be printed in a pigment which reflects no red—that is, a certain blue. Similarly, those parts not acted upon in the green negative may be printed in the complementary to green, that is, crimson; and those parts not acted upon by violet, in yellow. As the result, we have a picture which reproduces natural colours as faithfully as the purity of inks, the correctness of the colour screens or filters, and the accuracy of the register in printing will permit. On the parts which have not been acted upon in any of the negatives, and which must therefore have been black, the three colours are superposed in printing, and produce very nearly black. On the parts which have been

ed upon by all three sensations, and which must have been white, or rly so, little or no colour has been applied, and the white paper is to reflect undisturbed.

The three-colour process has made great advances recently, and its ults, which at first were very crude, have been immensely improved proper attention to the points I have mentioned. I have here several cimens of the latest productions, which I shall have pleasure in ding round for examination. The action of the photo-chromoscope, ich, I believe, we are to see to-night, I understand to be precisely the erse of this trichromic printing, as in it the rays of the three primary ours are themselves actually combined to form the complete picture, l white, not black, is produced by their mixture.

I should like, in conclusion, to draw attention to a property of colour ich might be made of some practical use, though it is usually regarded a drawback. I refer to the fact that the difference in refrangibility of our rays causes them to meet at different foci after passing through a s. Images containing several colours produced by an ordinary lens h therefore, to some extent indistinct. The eye being a lens produces s action, and violet rays are focussed by it in front of, and red rays rind, the mean position of the retina—that is to say, violet rays pro- ce the same effect as a distant object, red rays that of a near object. course, the impression of distance and solidity is conveyed to the in principally by binocular vision or stereoscopic effect, but the un- rscious focussing of the eye for rays from objects more or less distant s also a good deal to do with this impression. Colours towards the let end of the spectrum appear therefore farther away than they lly are, and those towards the red end nearer. Of course, it would be urd to apply this with the view of producing the effect of relief or idity in an ordinary picture, but it is possible to make it of service in metrical diagrams of solids, architectural drawings, and for other ful purposes, by showing the lines bounding the nearer surfaces in l, and the more distant in blue or violet. To produce the best effect, light values should be equalised by tinting the darker colour with ite. The effect is greatly enhanced by viewing the diagram through a nvex lens.

STEPHEN SMITH, B.Sc.

"COLOUR WITHOUT COLOUR."

NLIGHT, which appears to us to be white, is really composed of seven ours, the union of which constitutes the solar spectrum. These lours become visible in the rainbow, and usually take the following ler—red, orange, yellow, green, blue, indigo, and violet. They are narkable for their brilliancy, purity, and luminosity, and constitute e basis of all colour sensations. All colours may be reproduced proximately by a mixture of three colours, which vary according to lividual observation, but which are in the unanimous opinion of the ysicists red, green, and violet. In fact, when we distinguish seven lours, this distinction is absolutely arbitrary, seeing that there are an finite number of shades. The mixture of all these colours gives white, t very often we have, by reason of a physiological action, the sensation white by the mixture of two or three rays of the spectrum. When two ys of the spectrum give white light by their mixture, they are said to complementary—red, for instance, and greenish-blue give white, and also do orange and blue, and green and violet. We define, therefore, e greenish-blue as the complement of red, and say that violet is the mplement of green. These colours, which we call light colours—or tural or physical colours—are very different from pigmentary colours the colours of bodies. They are sufficient, nevertheless, to produce the immense variety of tones and shades found in nature. The laws their mixtures are different from the laws that govern mixtures of gmentary colours. The tints of these are reproduced more or less proximately by three fundamental colours, which are red, yellow, and ue. Red and yellow give orange, red and blue violet, yellow and blue- een.

Objects appear coloured to us by reason of a selection which they ercise on ambient rays. They appear coloured to us because, from the minous rays which strike them, they absorb certain radiations and ract others. The leaves of trees seem green to us because they con- n a substance known as chlorophyl, which retains all the other radia- ns and reflects back only the green rays, absorbing among others the mplementary rays of this shade. Bodies thus usually have a very ried power of absorption and reflection of the rays of light, and it is is quality that produces the infinity of shades. As a matter of fact, a dy never keeps nor reflects exactly a single length of light wave. If, r instance, red radiations are reflected, the body keeps a part of them reflects other coloured radiations at the same time, and it is not a pure l that we see. This is the case with the pigmentary colours.

Now, how are the light colours produced? As a rule, this is by fraction, as we have said before. For instance, at the moment of nset, when the luminary reaches the horizon, an intense red appears ere because the white light of the sun has been split up, and the other ys have undergone absorption in the water vapour contained in the air. exceptional cases the colour rays are produced by interference. The inbow effects on soap bubbles and on light layers of oil floating on ater are what are termed interference colours. Imagine planes very ose one to the other and very thin, of variable number according to the different points of the surface. Each luminous radiation is reflected and refracted a great number of times by these planes. It will be understood that according to the difference of phases of the systems certain reflected radiations meet with other radiations, giving either an excess of light or of shade. If the eye catches radiations of a single length of light wave, it registers only that; but as the incidental radiations are of very different length of wave, it will be easily understood that, according to the thickness of the layer very different retardations will be produced in the various phases of the reflected undulations. Consequently certain lengths of colour wave will disappear, and others, on the contrary, will persist. There is, therefore, either obliteration or over-production of the coloured light, for, as we have seen in the case of liquids, the waves are reinforced, or destroyed, or united together with varied results. When the rays of light meet thin layers of oil or essence floating on water, the layer reflects back different lengths of wave according to its different thicknesses. The colour which the layer takes, therefore, depends upon its thickness, and in proportion as this diminishes it takes successively the following colourations—red, green, blue, and violet.

The magnificent colours of soap bubbles constituted by a colourless liquid are produced by the thickness of the bubble, and it is easy to understand this, for in measure as the bubble augments in volume the colours will be seen to draw towards violet. Burnt pottery or earthenware owes its marvellous colouration to the same phenomena. The thin layers are obtained by the aid of a fondant, usually a silicate which, under a great heat, fuses and deposits an extremely thin layer on the earthenware. In all the places where these coats correspond in thickness with the length of the red wave the colour red is noted, and the same with all the other shades of the spectrum. The patina on certain metals due to oxides gives interference colours. A layer of paraffin or other oil over water gives again the same shades. In all these cases there is no pigmentary colour; the colours which catch the eye are light colours, produced by the interference with the undulations.

The phenomenon which causes essences and oils to spread themselves over water in thin layers must now be understood. This comes about by reason of a law known as the superficial tension of liquids. Just as is the case with solid bodies, a force exists which unites the liquid molecules and compresses them one against the other. It is as if the liquid surface is enveloped by an extremely fine membrane. This fact will be noted if liquid is poured into a glass in such a manner that it overtops the rim by several millimetres, but without spilling, and the top forms a convex dome without the liquid escaping. It seems retained by an invisible envelope, and this is a phenomenon depending upon the superficial tension of liquids.

It is on the basis of this delicate phenomenon that M. Charles Henry, the director of the physical laboratory at the Sorbonne, undertook to find the means of producing permanent colourations by the aid of light colours—that is to say, without employing any material colour. Essences with a superficial tension less than that of water are deposited on water in thin layers, and reflect all the colours of the spectrum. On blowing on this layer, according to the variation of the strength of the breath, a vibration is obtained which shows itself in a particular colour; but the essence quickly evaporates, and all the opalescent colours disappear. To make them permanent, something must be introduced into the liquid to fix them; and this, as the essence evaporates, must conserve the thickness of the pellicle at the same time as the colours. Charles Henry has used several resins and tars having the property of becoming insoluble in the essences under the influence of light, in the same way as bichromated gelatine becomes insoluble in photography. The pellicle has thus great permanence, since the solvent is eliminated. The thing now to be done is to transfer this pellicle to a solid support, so as to preserve it in an indelible manner; and, with this aim, several finishing materials are used, varying with the nature of the body to which the colour is to be transferred—wood, glass, paper, &c. To sum up, the method is based scientifically on the superficial tension of liquids, and practically on the action of light, which renders certain resins insoluble in their solvents.

The ground upon which the pellicle is deposited plays a great part in the effect produced. Black grounds give intense colours, white grounds much softer colours, and intermediate coloured grounds give very varied shades. In manufacture, either a hand or a mechanical process is used. In the first, paper with a glazed surface is spread out on a board in a vat provided with several supply taps. This is filled with water, and then the paper is smoothed down so as to get a perfectly even surface; next a little of the special mixture is poured on to the water, so that it spreads out into a fine coat, and soons forms a pellicle. The waviness of the surface necessary to produce the effect got by interference is obtained either by blowing the surface of the pellicle or by mechanical means When the pellicle is formed, the water is allowed to escape from the vat, and the pellicle gradually settles down on to the paper or wood underneath. The board is then removed and put into a drying chamber. The process may be done on a large scale mechanically, the pellicle being deposited on a web of paper run off a cylinder submerged in water. Paper ornamented with opalescent effects may thus be produced by the mile, but it is less artistic than by the first method. The name that has been given to this new process of producing "colours without employing colours" is irichromatine. The winter landscapes that Jack Frost produces on the window panes are well known to everybody. Charles Henry has adapted his process to the reproduction of these landscapes indelibly

in colours. The colourations and designs of the decorative effects got in this way are infinite. They vary infinitely according to the nature of the vibrations of the thickness of the coat, but the same designs can never be reproduced exactly. Of course, with the aid of reserves, a design may be traced on the ground which will stand out in the midst of the coloured effect.—*Revue de Chimie Industrielle.*

Our Editorial Table.

The American Annual of Photography for 1898.

Edited by W. E. Woodbury. New York: The Scovill & Adams Co. London: Dawbarn & Ward.

Mr. Woodbury has, as usual, attracted an able band of writers to his standard, and about 240 pages of articles on topics of the moment are given in this well-printed annual. Add to this that 300 half-tone and other illustrations are included, and some idea of the beauty of the book may be obtained. Indeed, one feels, in turning over its pages, that there is the money's worth in pictures alone. One or two of the articles on the "pictorial" side of photography are excellent specimens of futile word-spinning, but there is ample compensation for this defect in the very informative, practical contributions of W. H. Walmsley, O. G. Mason, W. H. Sherman, Paul Martin, Rev. T. Perkins, and others.

Christmas Cards.

[By Hills & Co., 108, 109, Fore-street, E.C.

Messrs. Hills have sent us a selection of Christmas cards manufactured by them on their own premises, drawing our attention to the circumstance that they are not made in Germany. The series embraces tastefully blocked four-page gilt-edged cards, with suitable inscriptions and spaces for the mounting of photographs upon them. Those that are pictorially adorned have views in colours, photogravure reproductions of well-known pictures, and photographic prints by way of illustrations. The cards are tasteful and refined, and merit great popularity.

Supplements to the Camera Club Journal.

Published by Harrison & Sons, 45, St. Martin's-lane, W.C.

With the December number of the Camera Club *Journal* is issued the first of five photogravures intended to form a supplement to the *Journal*. The subject is a pleasant bit of river scenery from a photograph by Mr. Cembrano. This picture inaugurates the second series of photogravure reproductions, works by Mr. Calland, Mr. Davison, Colonel Gale, and others having formed the first. We congratulate the Editor, Mr. Basil E. Lawrence, on his efforts to render his *Journal* pictorially attractive. The photogravures are in the main very good in quality, and it is to be hoped that the venture will be supported sufficiently by members of the Club as to guarantee the permanency of this useful feature.

The Scientific Requirements of Colour Photography is the title of the Sixth Robert Boyle Lecture delivered last June before the Oxford University Junior Scientific Club by Captain Abney, C.B., D.C.L., F.R.S. It is now issued in pamphlet form by Mr. Henry Frowde, Amen-corner, price 1*s*. Starting with an examination of the Young-Helmholtz theory of colour vision, Captain Abney indicates its applicability to colour photography, and successively reviews the work of Ives and Joly. Becquerel's and Lippmann's work is also briefly noticed. The paper is clearly written and easily comprehensible by those not very advanced in the subject, and it forms, therefore, a useful contribution to an important branch of photography.

News and Notes.

Photographic Club.—Wednesday evening, December 15, at eight o'clock. Lecture on *Portraiture*, by Mr. Harold Baker, of Birmingham.

M. Cailletet has presented to the Paris Academy of Sciences a memoir on apparatus for measuring the altitudes of balloons, and a means of verifying the results. An aneroid barometer is employed, and photographs are taken at two-minute intervals of the earth and of the aneroid, and it is asserted that the true height can be easily calculated.

Chloride of Gold.—Messrs. Johnson & Sons state that, as a close imitation of their labels has recently appeared in the market, amateurs who desire to use the genuine guaranteed "Scales Brand" chloride of gold, should carefully examine the trade mark on the red label of each tube.

Manufacturers having at heart the advancement of technical education should emulate the action of Messrs. Brunner, Mond, & Co. This firm voluntarily tax themselves to the extent of one penny in the pound on their works at Anderton, Barton, and the rural portion of Winnington, in the interests of technical education in Cheshire.

Royal Photographic Society.—Ordinary Meeting, Tuesday, December 14, at eight p.m., Professor Gabriel Lippmann will read a paper upon *Colour Photography*. The meeting will be held in the theatre of the Society of Arts, John-street, Adelphi. Non-members of the Royal Photographic Society will require admission tickets, which can be obtained on application to the Secretary at 12, Hanover-square.

Beautiful black chalk is obtained by mixing ordinary chalk with a suitable quantity of a decoction of logwood to which either green vitriol solution or chromate of potassium is added. By means of either of these substances logwood extract becomes black. The chalk is intimately incorporated with this black solution, and from the doughy mass pencils are formed, which are ready for use after drying.

The Photographic Society of Ireland announces an open-class competition in connexion with their Annual Exhibition, to be held on February 7 to 12, 1898, for which gold, silver, and bronze medals will be awarded (the gold medal conditionally on there being at least 100 entries). All photographs must be the work of the exhibitor in every particular, except in the preparation of the plates and paper. Labels and entry forms will be supplied on application. The same *nom de plume* to be used for every entry by one exhibitor. Entrance fee 1*s*. for each picture, which may be of any size or subject produced by any process. Pictures for sale should have the price marked on the back. Entries must be received not later than January 26, 1898. The Hon Secretary is Mr. Victor E. Smyth, 35, Dawson-street, Dublin.

Edinburgh Photographic Society.—The Annual Exhibition of Photographs will be held in the rooms of the Edinburgh Photographic Society, 38, Castle-street, Edinburgh, from Saturday, January 29, 1898, to Saturday, February 26, 1898. The reception of pictures closes on Wednesday, January 19, 1898, at ten p.m. Open Class: A gold medal is offered for the best picture in the whole class. Silver and bronze medals are offered in each of the divisions. A Division: Landscape, Seascape, and Architecture. B Division: Figure Studies and Portraiture. The Judges are Messrs. Robert McGregor, R.S.A. (Edinburgh), Andrew Young (Burntisland), and W. Grant Stevenson, R.S.A. (Edinburgh). All communications should be addressed to the Secretary, Mr. J. S. M'Culloch, W.S., at 2, George-street, Edinburgh.

The Ashton Exhibition.—A local contemporary says: "In all, the admissions at the photographic Exhibition numbered 4813. These figures do not represent persons. The season-ticket holders would nearly all count for five or six attendances each. There were also three or four hundred children, who were let in during the afternoon at a copper per head. The largest attendance was on Saturday, when 1183 came to the hall. On Thursday there were 1014. The other days the numbers were not so large. The record is a very good one, but the 373 on the opening day affords room for improvement at the next Exhibition. Still one can hardly anticipate any very great advance on the attendance. The total number of framed photographs exhibited was 736, and of unframed ones 161, being about double the number exhibited at last exhibition. There was a similar increase in the number of transparencies and stereoscopes. We understand that there is likely to be a small balance of income over expenditure."

At the Marlborough-street Police Court, on the 4th inst., before Mr Hannay, Herbert Whitdecourt, aged thirty-four, well dressed and described as an engineer, residing in North-street, Islington, was charged on remand with stealing a hand camera valued at twenty-one guineas, the property of Messrs. Adams & Co., 26, Charing Cross-road. On the evening of the 18th ult., the prisoner went into the shop of the prosecuting firm, and asked to be shown some cameras. After looking at several, he left the premises without making any purchase. On the following day the camera was missed, and subsequently the prisoner pledged it for 2*l*. When arrested on the charge, he told the police constable that he purchased it in Aldersgate-street. Detective-sergeant Bridges, of the C division, stated that the prisoner had been earning his living by acting as an understudy for a certain actor, but nothing was known against him. In reply to the magistrate as to whether he would have the case dealt with summarily or sent for trial, he replied that he was guilty. He expressed sorrow for what he had done, but said he did not know what he was doing at the time. Mr. Hannay sentenced the prisoner to four months imprisonment with hard labour.

Royal Institution.—The following are the lecture arrangements before Easter:—Professor Oliver Lodge, six Christmas lectures (specially adapted for young people) on *The Principles of the Electric Telegraph;* Professor E. Ray Lankester, eleven lectures on *The Simplest Living Things;* Professor Dewar, three lectures on *The Halogen Group of Elements;* Dr. J. Paul Richter, three lectures on *Some Italian Pictures at the National Gallery;* Professor J. A. Fleming, five lectures on *Recent Researches in Magnetism and Diamagnetism;* Professor Patrick Geddes, three lectures on *Cyprus;* Mr. William H. Hadow, three lectures on *The Structure of Instrumental Music;* Mr. Lionel Cust, two lectures on *Portraits as Historical Documents, Portraits as Monuments.* The Friday evening meetings will begin on January 21, when a discourse will be given by the Right Hon. Sir John Lubbock, Bart., M.P., on *Buds and Stipules.* Succeeding discourses will probably be given by Professor C. Lloyd Morgan, Mr. A. A. Campbell Swinton, Dr. J. Hall Gladstone, Professor L. C. Miall, Captain Abney, Professor J. E. Thorpe, Mr. James Mansergh, the Dean of Canterbury, Professor Dewar, and other gentlemen. Lord Rayleigh will deliver lectures after Easter.

Re J. T. DRINKWATER BUTT (lately carrying on business as a photographer and photographic dealer, Bank-street, Carlisle, now residing in London).—The above-named debtor made an application for his discharge at the Carlisle Bankruptcy Court, before his Honour Judge Steavenson, on December 1. The Official Receiver, in his report on the case, stated that the liabilities amounted to 1409*l.*, and that the assets had realised 425*l.*, or 214*l.* 17*s.* less than the debtor's estimate. It was expected that a first and final dividend of 4*s.* in the £ would be paid to the unsecured creditors. There were ninety unsecured creditors, most of whose accounts had been owing for a considerable time. The bankrupt had been negligent with regard to his financial position. He had been in business for a considerable time as a photographer, but, when he added to that business the business of dealer in photographic goods, he was hopelessly insolvent. The debtor was at present following no occupation. His Honour, in reviewing the case, said he did not think it a very bad case, taking all the circumstances of the case into consideration, and justice would be met by suspending the discharge for the minimum period allowed by the Act. Really the bankrupt had never been solvent since commencing business, but he appeared to have had no difficulty in obtaining credit, so that the creditors only had themselves to thank for being in receipt of so small a dividend. The discharge would be suspended for two years.

WIRELESS TELEGRAPHY.—Professor Silvanus P. Thompson lectured last week at the London Institution on the subject of *Signalling Across Space.* He commenced by observing that, whenever there arose any great need on the part of mankind, that need was met by some discovery or invention. It was curious also to note that many inventions were foreshadowed in some wholly impossible and absurd way. There was no subject about which so many myths had grown as that of the magnet, and in the Middle Ages learned men discussed the feasibility of "sympathetic telegraphy" by means of the needle. After the discovery of the electric machine, attempts were made to telegraph by wire, and Benjamin Franklin took up the subject of sending messages through water by means of electric sparks. Of late years it had been demonstrated that it was possible to send messages, say, across the Thames, by a method of electric "leakage." If anybody would give him 10,000*l.* for the construction of a base line, he would guarantee to signal to New Zealand without wires, although he did not know that any very useful purpose would be served. Waves of light had been employed for centuries for signalling, and the heliograph was used in modern warfare. All these experiments, however, were dependent on the transparency of the atmosphere. There was no such thing as empty space, however, and the material which filled all space could be utilised for the new telegraphy. Scientists were now able to telegraph from the base line by means of electric waves, quite independently of walls, houses, and the influence of atmosphere. The Post Office had taken up the work of Marconi, but there was nothing new in it. The apparatus was very beautiful, but the Post Office might as well have taken up the subject years ago.

MILLAIS AND HIS WORK.—At the London Institution, Finsbury-circus, on Monday, November 29, Mr. Whitworth Wallis discoursed pleasantly, by the aid of lantern slides, on *The Pre-Raphaelite Art of Sir John Millais.* In the school of English painters, the lecturer said, the artist occupied a unique position, and had achieved the widest and most deserving fame. For nearly fifty years the public had concerned itself with his work, and the Pre-Raphaelite contributions to art had excited the greatest interest. He would only touch upon one side of Millais' power—that of his Pre-Raphaelite pictures, he being the real founder and leader of the little band of art evangelists. He was a great genius, of a high level of attainment, which entitled him to hold an unquestioned place in the loftiest school of English painting. At the early age of sixteen Millais exhibited his first picture—one of the best historical canvases of the year, and from that time to his death it was rare that an Exhibition of the Royal Academy was not enriched by one or more works of his brush. He was the leader of the revolution in art book-illustration, and, about forty-five years ago, gave us some of the choicest specimens of the kind. Millais had painted everything, and each class of subject was impressed with his strong and marvellous personality and wonderful freedom and force. He had left a stupendous amount of work behind him, and the whole world mourned him as one of its greatest painters. He was the first artist to receive the distinction of a baronetcy, and his years of labour were crowned with honour and success. The revolt of the brotherhood against artificial academic rules had been fully justified, and had preserved art from further decline. At first the system was unreasonably criticised and abused, and Millais was shamefully attacked, but his realistic masterpieces and extraordinary technique were not now questioned. Although he produced great works in the last thirty years, Millais' reputation would always rest upon the cycle of artistic triumphs in the Pre-Raphaelite days.

THE DURHAM CITY CAMERA CLUB'S EXHIBITON.—The Durham City Camera Club held its Fifth Annual Exhibition of Photographs in the Shakespeare Hall, North-road, Durham, on Monday and Tuesday, November 29 and 30. From a general point of view the display of pictures was a noteworthy one; from a local stand-point, it left something to be desired. The Exhibition has rapidly improved since its inception, a new class being added each year. The exhibits of the first year were included in something like 21 sets of lantern slides. To-day the list of classes is wide enough to cover all the best methods and productions of photography. This year there were 117 landscapes and seascapes, 104 portraits, 50 pictures of architecture, 28 specimens under the heading "any other subject," and 38 sets of lantern slides. For the previous year (1896) the following are the respective figures:—Landscapes and seascapes, 59; portraits, 52; architecture *nil*, any other subject, 24: lantern slides, 19 sets. These figures represent a great advance in the short period of five years, and, if a similar rate of progress could have been chronicled with respect to members' entries, the 1897 show might, without flattery, have been described as one of the best of its kind in the country by comparison with similar towns. It is not easy, says a local paper, to fix the precise cause of this local falling off. The display in the Shakespeare Hall this week was evidence enough of the vitality of the Club's official doings. The Secretary (Mr. R. Hauxwell) and his coadjutors must have done a very large amount of cheerful patient work to achieve the results which they actually attained in the interests of the public. The Secretary attributes the blame to the all-pervading bicycle. Doubtless the iron horse is responsible for much neglect of art, whether in the shape of photography, painting, or music. It is, however, very questionable whether that is the complete cause in this case. Thirty of the exhibitors in the general classes had pictures hung at the Pall Mall Exhibition. There was also a very fine large portrait of Ruskin, by Mr. A. C. McCartney, a photographer of some repute, who is on a visit to Durham. Mr. T. S. Turnbull displayed, by means of a lantern, the greater portion of the lantern slides exhibited, and this display was greatly admired. There was also a cinematograph side show, which proved a good attraction. On Monday evening, Mr. J. P. Gibson, F.R.P.S., gave his popular lecture, *Fighting Northumberland*, and on Tuesday evening entertainments were given. The following is a list of the awards:—Class I. (Landscapes, &c.).—Silver medal, No. 25, C. F. Inston, Liverpool; bronze medal, No. 15, F. A. Bolton, Oakamoor; bronze medal, No. 77, C. E. Cowper, Sunderland; certificate, No. 90, W. S. Corder, North Shields. Class II. (Portraits and Studies).—Silver medal, No. 128, T. H. Flather, Scarborough; bronze medal, No. 217, R. S. Webster, Edinburgh; certificate, No. 199, W. S. Corder, North Shields. Class III. (Architecture).—Silver medal, No. 249, E. Bull, Forest Hill; bronze medal, No. 263, C. H. Oakden, East Dulwich; bronze medal, No. 248, C. Young, Blackheath; certificate, No. 251. H. Bennett, London. Class IV. (Instantaneous).—Silver medal, No. 291, C. Wane, Edinburgh; bronze medal, No. 282, E. Young, Blackheath; certificate, No. 287, W. J. Croall, Edinburgh. Class V. (Lantern Slides).—Silver medal, No. 320, W. E. Cowan, Newcastle; bronze medal, No. 318, C. F. Dickinson, West Dulwich; bronze medal, No. 313, J. W. Wade, Manchester; certificate, No. 317, H. Esler, Peckham. Members.—Class A (Landscapes).—Medal, No. 338, E. White; certificate, No. 337, F. Cluff. Class B and Class C (Portraits).—No awards. Class D (Hand-camera Work).—Medal, No. 356, D. W. Finlay; certificate, No. 358, H. Oliver. Class E (One Enlargement).—Medal, No. 367, D. W. Finlay; certificate, No. 364, Rev. H. E. Fox. Class F (Lantern Slides).—Medal, No. 374, H. Oliver; certificate, No. 376, F. Cluff. Special Prizes.—Gold challenge medal, D. W. Finlay; silver medal, not awarded; bronze medal, not awarded.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
13	Bradford Photo. Society	*The History of Photography.* Alex. Keighley.
13	North Middlesex	Technical Meeting, and Nomination of Officers for the ensuing year.
13	Richmond	*Negative-making.* J. A. Hodges.
13	Wakefield	Exhibition of Members' Slides.
14	Birmingham Photo. Society	*The Houses of Parliament.* Sir J. Benjamin Stone, M.P.
14	Brixton and Clapham	*Flower Studies.* E Dockree.
14	Hackney	*Enlargements.* John H. Gear, F.R.P.S.
14	Manchester Amateur	*Some Points in Picture-making.* G. E. Mellor.
14	Royal Photographic Society	*Colour Photography.* Professor Gabriel Lippmann.
14	Shropshire	Demonstration by the Thornton-Pickard Manufacturing Company.
15	Borough Polytechnic	*Speed-marking of Plates.* T. E. H. Bullen.
15	Coventry and Midland	Beginners' Night. H. Sturmey.
15	Croydon Camera Club	*Photographic Dodges.* T. C. Hepworth, F.C.S.
15	Kingston-on-Thames	Beginners' Night: *Enlarging Negatives.*
15	Leeds Camera Club	Beginners' Night: IV. *Printing.* C. C. Vevers.
15	Leytonstone	*Beautiful Devonshire.* G. U. Haslam.
15	Photographic Club	*Portraiture.* Harold Baker.
15	Polytechnic	Question Night.
15	Southport	*Enlarging.* John H. Gear.
16	Bolton Mutual Photo. Society	*Carbon Printing.* T. H. Heyes.
16	Leigh	Members' Lantern Evening.
16	Liverpool Amateur	Discussion on Development. Opened by Dr. Llewellyn Morgan.
16	London and Provincial	Lantern Evening.
16	Manchester Amateur	*Transparency-making.* J. W. Wade.
16	Oldham	*Life and Sights in Japan.* Joseph Seel, M.R.A.S.
16	Woodford	*Notes on Art.* J. P. W. Goodwin.
17	Borough Polytechnic	Development.
17	Croydon Microscopical	Discussion: *Sharp versus Fuzzy Photographs.* For, J. H. Baldock; Against, C. Moss.
17	Ireland	Practical Demonstration in Enlarging with Acetylene Gas. R. M. Inglis.
17	Oldham	Annual Dinner.
17	Wakefield	Lantern Exhibition. Members' Jubilee Slides.
17	West London	Members' Lantern Night.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 2,—Mr. Lewis Medland in the chair.

Mr. T. E. FRESHWATER (the Hon. Secretary) read a paper on

OPTICAL PROJECTION.

Optical projection was being made use of more and more every day in public schools and colleges, and even the Board schools were teaching very largely by its means. Optical projection, according to Lewis Wright, was the production of a picture or image—usually a magnified one—upon some kind of screen or visible plane, generally by means of a lens. The image might

be of a picture or of some solid object or piece of apparatus. According to Professor Dolbear in *The Art of Projection*, a magnified image of a picture or of any phenomenon, when thrown upon a screen by means of sunlight and lenses or with a magic lantern, constituted projection. Of the two things he proposed to show, the first was the projection of opaque objects on the screen, when it was to be borne in mind that the brilliancy of the image depended entirely upon the reflective surface of the object in the lantern. For instance, a dull object would reflect but little, if any, light upon the screen, while a white image would reflect nearly the whole it received. To the naturalist, the geologist, the numismatist, this power of projecting images of opaque objects was a valuable one, and Mr. Freshwater proceeded to show how such opaque objects could be thrown upon a screen. The method adopted was to remove the projecting lens, attaching in its place a special fitting provided with an opening in which this same lens was screwed. In projecting the picture of the opaque object the lantern was turned, at an angle, away from the screen, and the principle of the method was this—the light from the lime passed through the condensing lenses, and impinged upon the surface of the object to be shown, which, being at an angle with the rays of light, reflected them along another path through the objective, which formed an image of the surface presented by the object upon the screen. By means of this arrangement, pictures of coins, butterflies, shells, and paper photographs were projected upon the screen.

Mr. Freshwater then showed the invention of Mr. F. E. Ives, namely,

THE PHOTO-CHROMOSCOPE,

in so far as its application to the optical lantern was concerned. This instrument projected plain photographic slides upon the screen in all the colours of the original, each of the three slides being shown through red, green, and violet-blue screens respectively. By means of the attachment, three separate discs were shown, each being quite removed from the others; but by the gradual pressure of a lever, the edges of the outer discs approached and overlapped the central disc, producing an intermixture of their two colours, the red and green making a bright yellow and the green and violet a sky-blue. Continuing the movement, the three discs were eventually completely superimposed with the production of approximately white light. The purity of the white light depended on the source of illumination and the strength of the colour screens which latter required very careful adjustment to balance and give the proper effect. Each of the three negatives from which the transparencies were taken was made through a different coloured screen, and the difference between each was plainly visible, one giving the red sensation, one the green sensation, and another the violet sensation. In this way, when superimposed, each transparency stopped out all but its particular proportion of colour, which, combined upon the screen in accurate register, produced an image in all its natural range of tint. The crude primary colours were entirely lost, and in their place was seen a most exquisite series of delicate tints, formed by the combination of the three primaries in various proportions. Mr. Freshwater also observed that, if two stereoscopic pictures were placed in front of the red and green screens, and their images brought together on the sheet, they would appear as two pictures, one red and the other green. Now, by examining them through two coloured glasses of a corresponding colour value, these images would resolve themselves into one picture in strong stereoscopic relief, as in Ducos du Hauron's Anaglyph. A number of Mr. Ives's now well-known natural-colour slides were shown by means of the attachment, including baskets of fruit, sweetmeats, Japanese fans, &c. The peculiar effect produced by reversing the slide, so that the transparency for the red sensation was opposite the violet glass and that for the violet opposite the red glass, received much attention, the change of colour being easily followed by looking at an object of a known colour—such as an orange—and noting the tint assumed under the altered conditions.

PHOTOGRAPHIC CLUB.

DECEMBER 1,—Mr. Frank Hacs in the chair.

Mr. JAMES PACKHAM read a paper before a crowded audience, brought together under the auspices of the Affiliation of Photographic Societies on the

GUM BICHROMATE PROCESS,

subsequently demonstrating the operations of sensitising and preparing the pigmented paper and the development of the picture [see p. 789].

A large exhibition of the results of several well-known workers of the process was arranged round the room, and included work by Mr. Charles Moss, Mr. Rogers, M. Demachy, Mr. Packham, and others.

Mr. PACKHAM described his results merely as experiments, being nothing of a picture-maker himself, and said he was still engaged in experimenting upon the possibilities of the process. The demonstration went off with perfect success, and was attentively followed by the large number which had collected to see the process explained.

Mr. E. W. FOXLEE had been much interested in Mr. Packham's lecture and demonstration. He should like to mention that Mr. Pouncy first introduced the process over thirty years ago, getting some very good results. His method seemed precisely the same as that at present worked, with the exception of the departure in the sensitising, which was now done in the first instance. More credit was due, he considered, to Mr. Pouncy than had been bestowed upon him since the revival of the process, and the fact that his original results were fully equal to those of the present time established the process as being a workable one. He would suggest that the lecturer continue his experiments in the direction of the departure mentioned, and referred to the well-known continuing action of light set up by exposure in carbon tissue; but it was not generally known that this same action might be carried on by transmission to another film not really exposed to light at all, and by means of which one was enabled to develop up a picture on unexposed tissue. He suggested that a piece of the sensitised paper be printed in the usual way, afterwards being coated with the pigmented gum and kept moist for some hours. This should yield a developable image. Allusion was made to two processes of M. Marion's, in which the picture was obtained by this transmission action to unexposed tissue from a kind of transfer paper sensitised, printed, and placed in contact with the carbon tissue, the two being moistened with bichromate, squeegeed together, and kept moist for some hours. A modification of the gum-bichromate process in this way would give the great advantage, that the printing could be watched as in silver printing.

Mr. W. J. WARREN had noticed the fact that pictures by this method, printed on the same kind of paper, coated with the same pigment, and otherwise alike, presented a distinct difference in the grain. From his own experience, he put this down to the duration of exposure, and the longer or shorter exposure was responsible for the character of the grain. Regarding the gum, his own work had been done with the contents of the ordinary penny bottles (what ever they contained). It was decidedly acid, and this acidity seemed to yield a finer grain, while necessitating a shorter exposure to put the paper in a fit condition for handling than if gum arabic were employed. He inquired as to what had been done in the way of dusting-on upon the sensitised and gummed tissue with powdered charcoal, &c., by the air brush or the photogravure dusting box.

Mr. W. THOMAS said his aim in arranging for the meeting had been to bring forward the failures of the process rather than the successful results, as being of more interest to practical workers, and such examples were amongst those shown.

Mr. A. HORSLEY HINTON could not help reflecting upon the fact that, though to Mr. Pouncy might be due the origination of the process, it was just possible that the method might have remained as obscure but for some workers, who thought they saw in it a future which other processes did not offer, as it had been until two or three years ago. At the same time it had come amongst them in an unfortunate light, as he could not imagine that its most enthusiastic champions could for a moment suppose that the process was going to oust any already in existence. No doubt it would find its proper place, notwithstanding that many had spoken of it as "the process of the future." He was assured by Mr Skelton that it would be perfectly possible to prepare carbon paper which would admit of the same sort of control, showing that there was no virtue in the gum itself. Mr. Hinton also referred to the attempt to christen the process "photo-aquatint" by Mr. Maskell, to whom was due the revival of the method, and to the fact that his acquiescence was given at a moment when he had forgotten that Mr. Huson had applied it already to this modification of photogravure. Personally, he was in favour of the name of "the gum process," which was that used in France.

Mr. HORACE WILMER thought "photo-mezzotint" peculiarly suitable on account of some similarity of the process to mezzotint. The term "photo-aquatint" was undoubtedly used by Mr. Huson prior to its application to the gum-bichromate process.

Mr. PACKHAM said the essential difference of the present process from that of Mr. Pouncy's was that Mr. Pouncy did not saturate his paper previous to coating with his colloid, and, although he gave him due credit for his work, and had seen some by him equal to that of the present time, he thought that with the old method there was no real certainty as to what the result would be. By the saturation of the paper the purity of the whites was assured, and credit for this was due to Mr. Maskell. As regards dusting-on powder upon prepared surfaces of colloid, he and Mr. Wratten had been long engaged upon this, but this was approaching very nearly to the Artigue process. As regards the grain, he had discovered that this was due to the action of the bichromate upon the sizing of the paper, the nature of the grain depending upon the degree of action upon the sizing material.

Mr. R. W. CRAIGIE described how he printed the two halves of a piece of paper under two negatives, purposely over-exposing one and under-exposing the other. The first was developed for half an hour with the aid of hot water from a large rose, and eventually gave an image of a fine grain, whereas, with the under-exposed print, the image immediately developed with a very coarse grain.

Brixton and Clapham Camera Club.—November 30.—Mr. C. H. OAKDEN (President of the South London Photographic Society) gave a lecture on

ARCHITECTURE.

Mr. Oakden's lecture was just what was needed by any one taking up this branch of work, his advice being strictly practical and the result of long experience. The following hints from the lecture may be useful. In taking up architectural photography, two courses are open, either to take general views—doorways, windows, &c.—solely with a scientific or technical object, or to combine artistic feeling with the work and aim at also producing pictures. The latter way is, of course, the more difficult, and requires much care as to point of view, direction of light, &c. It will usually be found that the architect has followed a set plan, by which the best view is obtained from one particular place, and great care must be taken to find out this standpoint, a few inches one way or the other in the position of the camera making the difference between a good picture and the reverse. General views, as a rule, are unsatisfactory, and better results will be got by attending to the side aisles, doorways, tombs, ornaments, and other details. A square-pattern camera, or, at any rate, one with little taper, should be chosen, otherwise, with wide-angle lenses, the corner of the picture will be cut off. Swing and reversing back, and good range of rising and falling front are necessities, and a swing front is useful at times. The focussing screen should have lines ruled both ways; it can then be told when the subject is square on the screen without recourse to a level. The tripod should be strong and firm to avoid movement in long exposures, and for interiors the points of the tripod must be stuck in pieces of cork or indiarubber to avoid slipping on a smooth floor. Thickly coated plates rich in silver are best, and give less trouble from halation than thin, starved ones. Isochromatic plates are useful, particularly in interiors with much oak furniture; in cases also where much of the light is filtered through stained-glass windows, they allow much shorter exposure. All plates are best backed as a safeguard against halation. The lenses most useful are wide and mid-angle rectilinears. It is a pretty safe rule to use the longest-focus lens which will include the amount of subject required; but, as

much work has to be done at close quarters, the ordinary rectilinear is often of too long focus to use effectively. Single lenses are next to useless, as they distort lines near the margin of the plate. The lenses chosen should have good covering power, every movement of the camera at times being used to the fullest extent. If the lenses are temporarily fixed on to a larger camera and a few plates exposed and developed, a useful knowledge of their capabilities is acquired. Pyro-ammonia is used by Mr. Oakden for development He also favours quick development, which allows the image to be brought out without developing any halation present in the lower layers of the film. Some thirty or forty large prints, and about seventy lantern slides of various British architectural subjects were also shown by Mr. Oakden, adding much to the interest of the lecture.

Croydon Camera Club.—An attendance of sixty assembled in the Club rooms on Wednesday, 1st inst., when Mr. F. E. IVES demonstrated and lectured upon

COLOUR PHOTOGRAPHY.

In the course of some introductory remarks the President (Mr. Hector Maclean) reminded the audience that colour photographs were obtained by Becquerel nearly half a century ago, but, no fixing agent being discoverable, they quickly faded on exposure to light. Mr. Ives began by briefly describing "three genuine and non-secret methods of colour photography," *i.e.*, the Lippmann, the Ives, and the Joly processes. These he proceeded to illustrate and explain in considerable detail. The Lippmann process, due to the phenomena which are dependent upon the interference of light-waves under certain conditions, he did not think likely to be of any practical use, for, according to variations of exposure, the resulting colours might be indefinitely modified, *e.g.*, blue being rendered as orange or yellow, &c. Out of many thousands of exposures only about half a dozen had managed to approximate to the ordinary colours of nature.

BRILLIANT AND BEAUTIFUL EXPERIMENTS.

In order that his audience might follow his description of the kromskop photography, Mr. Ives rapidly sketched and illustrated, with several apt and telling experiments, the fundamental optical laws which more particularly affect his inventions. Spectrum analysis was described and demonstrated. The action of various coloured glasses in cutting off portions of the spectrum was next shown. Pure red and pure green left little but their respective colours visible in the spectrum, which was projected on to the screen. Mixed colours, such as pink, let through nearly all parts of the spectrum, yellow also was shown to be composed of most rays, except blue and violet. By means of a brilliant optical experiment with a block of didymium, Mr. Ives showed that the yellow sensation could be given by the spectrum after all its yellow rays had been suppressed.

SUGAR COLOURS.

The action of the polariscope was next dwelt upon. The effect of Iceland spar in giving duplicated images made a striking experiment on the screen, as did various other examples of the curious effects obtained by means of polarised light, most memorable being the wonderful colour images produced where a crystal of sugar was placed in front of the polariscope, the result being a splendid display of many-hued patterns, which, as the object was rotated, changed their form and colour. Having described the Clerk-Maxwell colour curves, and their importance to investigators in the field of colour photography, Mr. Ives proceeded to touch upon orthochromatic plates, and, in passing, derided the old idea that light could be split up into actinic and into non-actinic rays. By means of photographs of the spectrum he showed that a plate (collodion) dipped in a solution of chlorophyl, treated with pure zinc, and further stained with eosine, is chemically affected by practically the whole of the solar spectrum.

THE KROMSKOP.

The lecturer next proceeded to explain how a consideration of the foregoing and other phenomena and natural laws led him to perfect his system of colour photographs, which were produced by the obtention of three negatives, which represent the three main colour sensations which Clerk-Maxwell showed were necessary. By means of an elegant little instrument, somewhat similar to a stereoscope, but having important modifications, the images of three positives were superposed, and viewed as one coloured picture, in which the hues of nature were mirrored with great accuracy. Thus some astonishingly vivid realisations of a vase filled with brightly coloured flowers, a bright blue tropical butterfly with iridescent light upon its wings, a lump of unpolished opal, and many landscapes in colours were viewed by means of the kromskop. The lecturer also showed, by means of a triple lantern, large coloured images upon the screen. Many of these were enchanting examples of how Nature paints her pictures.

A MAGENTA MONOCHROME.

A distinctly different series of coloured photographic pictures was also shown; in these the lecturer had superposed three thin films, each one of which represented one of the three fundamental colour sensations. These evoked much interest and applause. The audience also evinced much curiosity at some slides which showed the colour methods of the Joly system. In this, besides the objectionable parallel lines which asserted themselves, the lecturer demonstrated that the colours had the extraordinary property of changing according to angle of view—thus red poppies might turn into green ones! A curious condition of defective vision had been brought out by the kromskop, which showed that there were many people who got their living by their colour sense, and who were, nevertheless, partially colour-blind. Thus, on one occasion, an artist, who exhibits regularly at the Royal Academy, looking at a picture of a landscape by means of the kromskop, declared that it was "all wrong, nothing but a magenta monochrome." A lady standing by was appealed to, and found that the kromskop rendered a scene full of delightful shades of green foliage. The artist was imperfectly colour-sensitive to green. In another case—this time it was a Birmingham art critic—a man was found not able to appreciate or see the red.

Croydon Microscopical and Natural History Club (Photographic Section).—December 3.—Mr. F. H. CARR gave a description, illustrated with between fifty and sixty slides, of the

SCILLY ISLANDS.

The number of these islands, said Mr. CARR, has been stated at anything between thirty and 200, but, whatever their number, the fact remains that most of them are but barren rocks; some, indeed, bear evidence of verdure, but only some five are actually inhabited and cultivated. They are reached by steamer from Penzance, which gives the visitor about four hours of a pleasant and interesting voyage. It *can* be very rough, but there is always the Atlantic swell to impart liveliness to the trip. The landing takes place at St. Mary's, the largest of the group, at one or two places, *i.e.*, St. Mary's Sound, always available, and the other the Crow Sound, between St. Mary's and St. Martin's, which, however, is only available at high tide, because of a sand bar across it. St. Mary's, being only some nine miles in circumference, can easily be done in a day; but, as there are so many things of interest, geologically, botanically, and ornithologically, to say nothing of photographically, several days could easily be spent here with both pleasure and profit. Several capital slides were shown illustrating the extraordinary rough-and-tumble nature of the rocks, which are granitic, occurring in this island. Tresco can be reached by boat from St. Mary's in about half an hour, and this island is a veritable paradise of loveliness. Ferns, palms, agaves, &c., grow luxuriantly out of doors all the year round, and vast quantities of flowers are sent from here to the London market. The Abbey Gardens are open to visitors freely, the only stipulation being that they behave themselves decorously and do no mischief. St. Agnes, St. Martin's, Bryher, and Samson about complete the list, and they should all be visited, under direction of the boatman, wind and weather permitting. Of course, in such a locality it will readily be imagined that, with wind, sea, and rocks combined, shipwrecks are by no means uncommon, and some of the most terrible on record have occurred here. In fact, at one time the inhabitants lived chiefly by wreckage, and, if a wreck did not come naturally, they provided one by alluring ships on to the fatal rocks by burning false lights.

Hackney Photographic Society.—November 30, Mr. A. Mackie presiding.—Mr. J. H. GEAR gave the second of his series of lectures. It was on the subject of

CARBON TRANSPARENCIES.

The process was described most completely throughout, and the development of a transparency demonstrated. At the end of the lecture, referring to the carbon process, the CHAIRMAN said that he considered it one of the most beautiful and interesting of processes, and he recommended those present to take it up. It had a great range of colour and surface, was easier to work than gelatine chloride, and had more latitude than any process, except perhaps bromide paper. At the next meeting Mr. Gear deals with *Enlarged Negative-making*.

Kingston-on-Thames and District Photographic Society.—The Committee of the above Society met last week to discuss arrangements for the Annual Exhibition. It was decided to admit enlargements to all classes, and a class not in the programme last year will be added this year, viz., a *genre* class. The VICE-PRESIDENT and TREASURER (Mr. W. M. Robertson) gave a demonstration of

CARBON PRINTING

at the weekly meeting last Wednesday, and his lecture was listened to with great interest.

Richmond Camera Club.—November 29, Mr. Cembrano being in the chair.—Mr. Davis, the Secretary of the Club, gave a demonstration of developing with

AMIDOL.

He said he did not claim for amidol that it was a better developer for negatives than pyro, or for lantern slides than quinol, or for bromide paper than iron, but he thought that, if restricted to one developer for all purposes, one might do worse than choose amidol as that one, and it had a distinct advantage over other developers in point of simplicity. The formula he recommended was ten grains of amidol dissolved in four ounces of five per cent. solution of sulphite of soda, with the addition of a small quantity of bromide of potassium (say, at most, one grain to the ounce), if required. He proceeded to develop some enlargements on bromide paper, the exposures of which ranged from eight seconds to three minutes, with the unrestrained and restrained developer, obtaining good results, and a lantern slide, which gave a good black. Finally, a couple of under-exposed negatives were developed, one with pyro, the other with amidol, but the results could not be said to show any decided superiority in the forcing powers of either developer.

Birmingham Photographic Society.—November 30.—Dr. Hall-Edwards showed a few experiments he had made on the effect of heat upon a photographic plate, which he thought might explain what was thought to be spirit photography. Dr. Edwards's experiments consisted in placing a hot coin and a bottle containing hot water upon a sensitive plate. Upon development, it was found that an image corresponding to the size and shape of objects was to be seen. Mr. UNDERWOOD read a paper by J. A. Hodges upon

NEGATIVE-MAKING.

The writer said it was impossible to lay down any hard-and-fast rule as to what was a perfect negative, but he preferred one with a full range of density, from shadow to high light, and one in which there was a perceptible deposit in the shadows. The use of a slow plate was strongly recommended. To show the advantage of using backed or anti-halation plates, two slides were shown upon the screen from photographs of a glowing incandescent gas mantle. One was upon an unbacked plate, and the other upon a Sandell multiple-coated film, the latter showing the formation of the mantle, while the former was all blurred through halation. The advantages gained by using isochromatic plates was shown, but the results did not satisfy the members present as being a correct rendering. The use of a roller-blind shutter, instead of the ordinary lens cap,

was advocated, as by its use the exposure could be varied between foreground and sky. Development, fixing, varnishing, and intensification were treated at length, and the necessary formulæ given in each case. The Chairman (Mr. G. A. Thomason) presented to Mr. A. R. Longmore an illuminated address, conveying the thanks of the Society for his valuable assistance, for a period of over seven years, in connexion with the Annual Exhibition.

Edinburgh Photographic Society.—December 1, Mr. James Patrick in the chair.—Mr. G. G. CUNNINGHAM read a paper entitled

A NOVELTY IN INTERIOR PHOTOGRAPHY.

In photographing interiors with the camera pointed directly towards the windows, it is almost impossible to avoid the occurence of halation in a greater or less degree. Mr. Cunningham, however, explained a method by which not only is halation entirely avoided, and all the details of the window beautifully rendered, but the view outside is also secured, correctly exposed, and perfectly sharp. The plan followed is briefly as follows:—In the evening the room is photographed by the magnesium flash light. The lens is then capped and the camera left in position till daylight the next morning, when the lens is very much stopped down, and a short exposure made on the window. This second exposure, while long enough to secure the detail about the window and the outside view, is too short to have any perceptible effect on the image formed the evening before by the flash light. In photographing the interior by the magnesium light, the flash lamp is placed directly over the camera, and in this way no shadows are thrown, and cross shadows from the two exposures are thus avoided. Some very good views produced by this method were shown. Messrs. Wallis and Fraser showed a large number of pictures by the cinematograph, and gave a short history of the instrument. They also showed apparatus for printing and developing the films. The President stated that sixty new members had been enrolled since the beginning of the session.

1897. FORTHCOMING EXHIBITIONS.

December 10, 11.....	Aintree Photographic Society.
,, 28–Jan. 1.	Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough-road, S.E.
1898.	
January 17–22.....	Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
,, 29–Feb. 26.	Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.
January–February...	Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30	National Photographic and Allied Trades Exhibition A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14.....	International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Patent News.

THE following applications for Patents were made between November 24 and December 1, 1897:—

DEVELOPING FILMS.—No. 27,375. "Improvements in Apparatus for Developing, Fixing, and Washing Photographic Films and the like." N. WIGHT.

DEVELOPING APPARATUS.—No. 27,486. "Improvements in Rocking Apparatus for Developing, Washing, or Treating Photographic Plates." T. ELLIOTT.

ANIMATED PHOTOGRAPHY.—No. 27,505. "Improvement in Apparatus for Taking, Enlarging, and Projecting Successive Pictures of Moving Objects." Complete specification. N. NELSON.

KINEMATOGRAPH APPARATUS.—No. 27,542. "Improvements in Kinematograph Apparatus." A. S. NEWMAN and NEWMAN & GUARDIA, LTD.

CAMERAS.—No. 27,552. "Improvements in or connected with Photographic Cameras." I. KARPOFF.

CYCLE-CARRIER.—No. 27,859. "Improvements in the Mode of or Means for Carrying a Photographic Camera or other Apparatus on a Velocipede." O. SICHEL.

ANIMATED PHOTOGRAPHY.—No. 27,929. "Improvements in Film Operating Mechanism of Apparatus for Taking, Printing, and Exhibiting Series of Photographs." C. W. BAXTER, C. WRAY, and J. OULTON.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTO-MICROGRAPHY.

To the EDITORS.

GENTLEMEN,—I have read with much interest the article in the JOURNAL of November 5 on *Photo-Microscopy with Photographic Lenses*, as I have employed the same means in much of my work during the past ten or more years. To be more exact, I should, however, say that this work has been altogether in macroscopic objects, making what I would term photo-macrographs, since, for microscopic work, I have had an ample battery of objectives, suited thereto. There is no doubt that a good photographic lens of short focus would make a negative from numerous interesting microscopic subjects, similar to those named in the article referred to, of such excellent definition as would permit any desired enlargement in the optical lantern, without perceptible loss. It seems to me that your suggestion is most timely, and should be valuable to many who have no microscopical apparatus at their command, but who could utilise their photographic outfits in this direction during the dull winter months. Paper prints from negatives of minute objects thus produced would be too small for general interest, as the magnification would rarely exceed six or eight diameters, with lenses of more than four inches focus, but from their excellent quality, as stated, would be admirably adapted to lantern enlargement. It is to be hoped that many of your readers may be induced to try their hands at the work.

A very useful and important field of work for the photographic lens may be found in the slight enlargement of macroscopic objects, such as many anatomical sections and other preparations, sections of large stems, seeds, fruits, &c., which are too large to be embraced by the field of any microscopical objective. The slight magnification possible with the photographic lens gives to the unaided eye an admirable picture of the whole subject, and relationship of its various parts and features; but the minute details of structure must be studied or photographed by the microscopic objective.

My photo-macrographs have mostly been made with two of Beck's rectilinear lenses of five and seven inches focus respectively, and with stops of *f*-22·5. With my enlarging camera, these lenses give a range of magnification from about two to six diameters. A few seconds' exposure with diffused daylight and slow plates suffices with most subjects.

I am sending you by this post three prints just made from negatives taken in the summer of 1890. They are from the human subject, and the notes accompanying each fully explain both subject and treatment. The slides from which the negatives were made were prepared by one of our eminent specialists, Dr. Carl Seiler, and he expressed great satisfaction with the photographs at the time.—I am, yours, &c., W. H. WALMSLEY.

4248, *Pine-street, Philadelphia, November* 23, 1897.

[The prints sent by Mr. Walmsley are from macrographic negatives of a fœtal foot (long section) × 4½ diameters, fœtal larynx (trans section) × 6 diameters, and human adult larynx (trans section) × 4½ diameters. They well illustrate Mr. Walmsley's point, that admirable direct enlargements of such subjects are obtainable with the ordinary photographic lens.—EDS.]

AN OVERLOOKED PROPERTY OF BICHROMATED GELATINE.

To the EDITORS.

GENTLEMEN,—Having for the last year or two been making experiments with bichromate processes, I independently discovered a few months ago the principle described in your article on the above subject, and was quite unaware that it had already been found out by any one. On November 4 I applied for a provisional patent for my application of the principle—an application which is of greater simplicity than the Mariotype. It seems curious that the main advantage which the principle suggests appears to have been overlooked by M. Marion.

The plan which I have adopted, while of extreme simplicity, does not involve even the single transfer, the action upon the gelatine being started on the *under* surface of the film, instead of on the *upper* surface, as in ordinary carbon printing. I have found that the upper surface washes away into relief without any transference at all.

You will, perhaps, allow me this opportunity of stating that my experiments were conducted quite independently of those of previous workers, and that, though I consulted some of the highest authorities upon bichromate processes, I could not hear that any knowledge existed of the principle which you describe, except that one correspondent told me he "believed" the principle was not new, but he could not say who had previously discovered it. CHARLES E. BENHAM.

28, *Wellesley Road, Colchester, November* 30, 1897.

[Mariotype is fully described by the inventor, M. Marion, in a paper printed at p. 242 of this JOURNAL for the year 1873.—EDS.]

ENLARGED NEGATIVES.

To the EDITORS.

GENTLEMEN,—I cannot help calling attention to the erroneous statements which sometimes appear in your columns. In your issue of December 3 a treatise on negative-enlarging by Mr. Welham appears in which we are told that instantaneous views cannot be taken direct on large plates, as the lens requires stopping down to get the necessary focus. But this fact is overlooked, that in enlarging the small negative its bluntness of focus is enlarged in proportion, so that we get no sharper

ure than if we took it direct without stopping down. Moreover, I ık that large pictures do not require the same degree of sharpness, may therefore be taken with the same relative stop.—I am, yours, &c., *December* 3, 1897. FACTOTUM.

Our correspondent does not quote Mr. Welham correctly. That ıtleman says, p. 96 (LANTERN SUPPLEMENT): "One can some- ıes obtain a good quarter-plate instantaneous view, which it uld be impossible to take on a larger plate owing to the stopping vn necessary to get good depth of focus with a long-focus lens." EDS.]

THE NATUROGRAPH.

To the EDITORS.

GENTLEMEN,—In your yesterday's issue I read a letter signed Paul L. ıterlow, and also some comments by yourself, on the Naturograph ndicate. As regards Mr. Waterlow, I think he had better read again ı lecture before wasting any more time and ink on assertions the rpose of which is palpably obvious even to a child.

With reference to *your* paragraph, I have known THE BRITISH JOURNAL PHOTOGRAPHY sufficiently long to appreciate its general sense of fair- ss; but I fear that, unless you were in possession of all details per- ıning to Dr. Selle's process (which for obvious reasons is impossible), u might quite likely be drawn towards erroneous deductions. It has own to be the fashion to lump together anything coming under the ıad of three-colour photography and printing without endeavouring to alise that there can be variations, not of principle, but of detail, con- ituting invention, and gulfing the breach between failure and success. night dwell on the unsatisfactoriness of the systems hitherto commonly nployed, and some of their inherent faults which can never be elimi- ıted; but it is not my province to decry anything. Let me state that, nongst other countries, we have been granted patents in Germany and weden, notoriously two of the most particularly exacting patent offices; ıat we have half a dozen matters of detail, which may or may not be ıtented, although they are patentable; and, further, that we can turn ıt work quicker, better, and at fifty per cent. less cost than by any other ethod. If this constitutes nothing, then I, for one, have nothing ırther to say.

I will conclude by mentioning that the process is only brought forward ow after its commercial importance has for over fifteen months been ıoroughly tested in practice by Mr. Frisch, a gentleman whose reputa- on requires no endorsement from me; also that I have promises of ork sufficient to bring in a large revenue for years without hardly any ffort, and that I should be able to at once place licences with at least alf a dozen lithographers were I so minded.—I am, yours, &c.,

R. B. ROXBY.

18, *Featherstone-buildings, Holborn, London, W.C., December* 4, 1897.

[There are some comments on the prospectus of the Naturograph ndicate, Limited, on p. 785 of the present issue of the JOURNAL. We have, of course, every desire to be fair to Mr. Roxby; but the esponsibility for any erroneous deductions that may be come to in elation to a quasi-secret process of colour photography must clearly est with those who refrain from taking the investing public to whom they are appealing sufficiently into their confidence.—EDS.]

HONOUR TO WHOM HONOUR IS DUE.

To the EDITORS.

GENTLEMEN,—Having noticed several articles in your paper concerning he reinventing of old patents, I am taking the liberty of drawing your ttention to Patent 13,751, a leading article concerning same having been ublished in the December number of the *Process Photogram* under the eading of "Metallic Contact Printing without Light." If you will indly refer to an article published in the *Journal of the Society of Arts*, February 5, 1864, p. 179, you will find this process was invented and atented in France and England nearly thirty-four years since by Monsieur Vial, some months *before* Mr. Dallas's secret process was first oticed in the same journal.

In January of same year, Monsieur Vial read before the Society of Arts a paper on this process, which he divided into three sections, the atter including photography in his specification. About two years since, I experimented a *little* over this process, and, besides being interesting, it s also useful. The metal resist prevents undercutting without it being ecessary to roll up with a waxy ink.

Monsieur Vial describes the lines produced as being a perfect V-shape. The process was only used for intaglio blocks, but I think it might also e used for relief blocks.

If you care to take this matter up, and you are not able to see a copy f *Journal of the Society of Arts*, I shall be pleased to send you a written opy of the proceedings of same Society of January 1864.

In the article on *Gum-bichromate Process*, I notice Dr. Clark does ot make a single remark concerning the inventor of this process, Mr. Pouncy, of Dorchester.

After anxiety and time spent by poor inventors, who often get very little remuneration for their labours (like Archer, of collodion process), surely a little honour should be given to whom honour is due.—I am, yours, &c., JAMES KIRKWOOD.

Nottingham.

[We shall be pleased to have the promised particulars of Vial's process. With regard to the bichromated gum process, we have repeatedly given Pouncy credit for it, and do so in the present issue. Modern workers, however, are often ignorant of what was done in former years, and, unfortunately, seldom take the trouble to ascertain. —EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

John Kennerell, 7, York-row, Wisbech.—*Photograph of bonfire in the Park, Wisbech, to celebrate the Diamond Jubilee, June* 22, 1897.

RECEIVED.—HENRY SOAR; YORKSHIREMAN; A VETERAN; A MEMBER OF THE ROYAL PHOTOGRAPHIC SOCIETY; R. B. U.; J. LIZARS; SOUTH WALIAN; COLD PLATINUM; PORTRAITS; CONSTANT READER; PHOTOCAPE; and many others. Owing to the exceptional pressure on our space, these correspondents' communications must remain over till next week.

D. WIRTNER.—The formula as given is complete. We do not recommend it.

F. GUTEKUNST.—The date should have been October 1. See page 626 of the JOURNAL for that date.

G. READE.—No, not if the method is really different. Better procure the ALMANAC for 1898, in which several processes are described.

PATENT PROCEDURE.—PHOTOMETER. 1. Yes, protect the invention before showing it to your friends. 2. We should advise you to communicate with a firm likely to take up the invention.

ADDRESS OF MR. SMALLCOME, OF BAKER-STREET.—The correspondent who inquired for this address last week, is informed that Mr. F. G. Dalby, of Oscar House, Lewisham, will be pleased to answer inquiries.

COPYRIGHT.—T. H. J. Your copyright in the photograph is so dubious that we should not recommend you to commence legal proceedings. Doubtless the proprietors of the local paper know that, hence their defiant attitude.

FRILLED NEGATIVES.—T. OSMAN. The cause of the frilling is that you have used the water too warm. Surely water over 50° is not so unpleasantly cold in working as to need heating. The plate in question would certainly not have frilled in water at 65°, so you must have had it much over that temperature.

ENLARGING.—B. B. WILTON. To enlarge from a 12×10 negative, a condenser of fifteen and a half or sixteen inches will be necessary. If you use the light from an incandescent gas burner, you will find the exposure will have to be very long, even when extra rapid paper is employed. Better adopt the lime light if you are going to work professionally.

COLOURING.—TINTO inquires: "Can you tell me of something to wash over photographs before tinting to make the colour take. The best thing I know is to lick them, but my colourist is tired of licking."—If your colourist gives the prints a wash over with prepared oxgall, to be had of all artists' colourmen, he will find it a good substitute for "licking."

R. WELLMAN.—We see no reason why a process could not be worked out upon those lines and be made to yield a profit, but you seem to expect us to do it for your special benefit, as it would be of no use for our readers, with perhaps one or two exceptions. If you wish to reap any benefit from the idea, you will have to work it out to a practical issue for yourself.

BOOK ON LENSES.—E. H. SPEIGHT says: "I should be very much obliged if you could tell me whether there is a book published on photographic lenses, and where I should be able to procure it."—In reply: *The Optics of Photography and Photographic Lenses*, by J. Traill Taylor, published by Whittaker & Co., White Hart-street, Paternoster-square, E.C., price 3*s.* 6*d.*

TONING.—MIDLANDS. If the solution of acetate of soda turns to a dark colour directly the chloride of gold is added, it is clear that something is wrong, and the bath is of little use. Impurities in the water or the acetate of soda may be the cause; but most likely it is the use of unclean vessels in which the bath was compounded. It is very unlikely that the chloride of gold is at fault.

PATENT.—C. W. We do not know if the patent, the specification for which we published a few weeks ago, is sealed yet or not. It does not matter if it is; you can still go on as you have done before without let or hindrance. If you have been making and selling the same thing for years, the patentee can't stop you, because his patent is invalid by reason of your anticipation of his invention.

STAINED PRINTS.—W. WARDLE. The stains are due to the use of too weak a fixing solution. One ounce of hyposulphite of soda to the pint of water is far too weak even with a quarter of an hour's immersion—notwithstanding your friend's opinion to the contrary.

SALE OF PRINTS.—ENGLISH says: "I have a large quantity of collotype prints of English subjects (scenery) which I want to sell in America. Are there any restrictions to stop me doing so?"—None that we are aware of. You will, however, have to pay a Customs duty upon them.

FAULTY ALBUMEN PAPER.—OXON. 1. The fault is certainly in the albumen coating. This can be clearly seen if the paper be exposed to light by the uneven way it darkens as well as by the inequality of the gloss on the slightly darkened surface. Such fault was very common years ago, but is seldom met with now. It is more likely to be met with in papers with a high gloss than in those with a more moderate surface. 2. The acetate toning bath will give the tones you desire, indeed we believe it is the only one used by the firm mentioned.

BOOK ON COLLOTYPE.—ANXIOUS says: "Will you please be kind enough to tell me the best work published on the collotype process? Is there not a German work translated into English which deals more with the making of plates for machine printing? If so, where can I purchase same? I may say that I am employed in the Woodburytype process, but, as the demand for that does not seem to improve, I should like to perfect myself in collotype."—In reply: *Collotype*, by Dr. Schnauss, translated by E. C. Middleton, and published by Iliffe & Son, St. Bride-street, E.C., will probably meet your requirements.

DAMAGED LENS.—A. F. BIGGS writes as follows: "I have been offered a rapid rectilinear lens by —— for large pictures at a comparatively low figure, but it has a bad scratch on the inside surface of the front lens, about half an inch from the edge. The owner says it was done by an assistant when cleaning the lens, but he found no difference in its working qualities after the damage from what they were before. Your advice on the matter will be esteemed."—The scratch on the glass lowers the commercial value of the lens, but it makes no practical difference in its working qualities, only an infinitesimal loss of light. Don't be deterred from purchasing the instrument on account of the scratch.

WRECKED STUDIO.—WORRIED. As you have the premises on a repairing lease, we expect, according to its terms, you will have to make good the damage caused by the late gale. As you have already held the premises for eleven years, you ought to have been perfectly aware as to whether the studio was in such a condition as to withstand a strong gale, which, of course, it might be subjected to at any time. If it was not, it was your place to have strengthened it. So far as we can see, you cannot compel the landlord to do the necessary repairs. We should advise you, however, to see him and ask him to bear part of the cost. If this is politely done, he may help you, but not through your solicitor.

BROKEN NEGATIVE.—A. M. R. writes: "Will you please to answer the following? I have a whole-plate negative sent to me of great value. It was carefully packed and marked "Glass, with care." When it arrived, it was broken. I sent a claim to the Great Eastern Railway Company, on whose line it came, and have had a reply that they cannot entertain it. What would you recommend me to do?"—The only thing is to sue the Company to whom the parcel was intrusted for the damage, though it is doubtful if you will recover unless the damage was pointed out at the time the parcel was delivered. If it was known then, the package should not have been accepted. In signing the receipt, it is tacity admitted it is received in good condition.

STUDIO.—INQUIRER says: "I am about to build a studio, the only light I can get being north-west. There is the gable end of another house about eighteen feet off. Would this interfere much with the light? I can get about twenty-five feet long by about ten feet wide. What amount of glass would you recommend? Would ground glass be preferable? The light would be about the shape of sketch. What height to eaves do you recommend, also length and height of top light? Hope you will understand this description."—The house will not very materially interfere with the light, though it would be better were it not there. We should, under the circumstances, prefer ground glass for the roof. The shape will do quite well. Make the height to the eaves about eight or nine feet.

FADING.—W. WILLIAMS writes as follows: "Will you please give me your opinion of the cause of the fading of the enclosed two prints, as they, and others like them, have been done less than a year. They, as you will see, are on P.O.P., and were toned in the usual combined bath with alum and acetate of lead. The prints were perfect when first done, and you see the deplorable condition they are now in. Separate toning and fixing is such a bore, and the combined bath is so much more simple and better."—The combined bath is certainly less trouble to use, but we must protest against its being better, that is, if permanence is any consideration. The combined bath is not to be relied upon in the hands of novices when it contains such materials as alum, lead, &c. Much has justly to be said in its condemnation.

LIGHT IN STUDIO.—C. WILLIAMS writes: "Please give me your valuable advice on the following: I have just opened a studio; it is 20×12, with a direct north light. The shadow side is covered in top and side, and about four feet top and side of north side each end with dark blue celecia. The glass is ground, and top eight feet long, side four feet; but the light on sitter seems too glaring, and pictures develop up so black and white. My ambition is to get softer pictures. Will you please give me your kind advice as to what colour curtains would be best to use for top light, twelve feet glass, and also side light?"—The description of the studio and the lighting is not quite clear. Dark blue blinds and curtains will be very suitable, if rightly used. A reflector will help to soften the shadows if they are too strong without.

RETOUCHING BY ARTIFICIAL LIGHT.—WHITE LIGHT asks: "Would you ki tell me what to place between an oil lamp and a negative to make light whiter for retouching in the evenings? I find the light of lamp alone too yellow and very trying to the eyes. I have seen bo containing a bluish liquid used for this purpose, but I do not k what they are called or where to obtain one. If you could give the information, I should feel very much obliged."—Interpose betw the light and the negative one or more thicknesses of ground glass use a mask of brown paper, so as to shield all the negative except which has to be worked upon. Large flat bottles, such as are use show bottles in chemists' windows, are to be had of druggists' sun men, but the ground glass will answer the purpose with a suitable la

ENLARGING.—A. C. asks: "Could you give me a satisfactory answer to following questions on bromide enlarging with incandescent gasli I have an eleven-inch condenser and a Taylor, Taylor, & Hobson 8½×6½ box, whole-plate camera, &c., like drawing. Why is it th cannot get an even light all over my whole-plate groups or landsca Is the box large enough, or is it the lens, or do you think one light s cient? I can get on all right with bust enlarging; but, when it co to enlarging from a whole-plate, I am beaten, because I cannot get light all over alike, and it is necessary to stop the lens down w enlarging from whole-plate, as when I have done so the paper on easel looks patchy."—It would seem that the light is not in the r position with regard to the condenser and not properly centered. it placed at different distances, and with a mask in front of it, so a make the light more as from a point. In enlarging from a whole-p negative most professionals use a 10×8 lens, so as to the better cover plate.

STUDIO.—BURMAH writes: "I desire to build a studio at the side of house. The space at my disposal is 35×10 feet. I purpose buildi a studio 20×10 feet. I am at a loss as to what would be the best sh to make it; I must make it running from south to north. No. 1 is "general shape," No. 2 is a "lean-to," and No. 3 is a side view the next house is only nine feet away. I fancy I would get a be north light from No. 3; there are no houses in the rear for forty at least. I have given the side view of No. 3, as it explains the sh better. The roof would run towards the north. If you would fav me with your opinion, I should deem it a favour, and state how m glass should be put in roof and side."—The space for side light is y circumscribed, but we should prefer design No. 2. With No. 3 chief light would be almost entirely front light, and that, altho suitable for copying purposes, is not good for portraiture. If design No. 2 be adopted, have six feet of the roof at each end opa and four feet at the sides; the rest may be glass.

PORTRAIT.—CABINET asks: "Will you kindly say how I may proceed th the following: A customer called at my studio in September last, gave an order for six cabinets of his child, which was photographed the proof submitted (voted a perfect likeness by all who knew child). The father called a week later, and said he was not sati with the card, could not give me a reason, and would not agree to t the child to resit, but offered 1*s.* to get clear, which I did not acc saying that 3*s.* 6*d.* was the charge for a proof cabinet portrait, and though he did not pay for the cards ordered at the time of sitting was entitled either to let the child resit, or I complete from the na tive already taken. He left, saying he would let me know in a da so. Not getting any word, but having learned that he had had the photographed at another place in the interval, I wrote saying th I would complete the order as per proof unless he let the child be t on or before the 27th inst. He returned my letter with the informa on the back thereof that I could not complete, as the proof ha been approved. Can I complete from the negative I have by me, sue for the amount agreed upon, viz., 6*s.* 6*d.* I had two witness the giving of the order, and as to 6*s.* 6*d.* being paid on delivery. P let me know what I can do in the matter, and greatly oblige."—I dently the portrait is not approved of, and the only thing we see you can do is to sue, if that is worth while, for the proof that has been returned.

MOUNTING.—FELIX says: "I should be greatly obliged for informatio to the successful and easy mounting of collodio-chloride. We Trapp's Gladiator, and as it is a very strong and thick paper, a tendency to curl at the edges, the ordinary starch mountant is not suitable. The makers recommend gelatine, and, as I have never accustomed to using gelatine as a mountant, I find some difficul experimenting with it, as I can only use my employer's material; I used it warm (a solution of 2 ounces gelatine; ½ ounce glycer 2½ ounces methylated spirit; 8 ounces water), but find it gets st and stringy as it becomes cold on the print before I can it coated evenly enough and the edges smoothly pasted, prepara to putting on the mount; and, on rubbing down, find it fearfully lu and unsightly, which appearance certainly dries out and looks sm enough when thoroughly dry. Still, I cannot but think there mus some easier, and quicker, and more satisfactory mode, of which I unaware. The Paget C.C. is easy enough to mount with ordi starch paste, and I have never had any difficulty before in an experi of eight years' mounting, until we began some months ago to use Gladiator—a really splendid printing paper, but, I suppose, ra expensive. It is awfully bad to mount, and takes two hours to mo a batch that in any other papers would not occupy more than an h Can you give me any instruction? Thanking you in anticipation."—mountant is a very good one, but probably an unsuitable gelatin used. We should advise that such a gelatine as Nelson's "N Soluble" be employed, and the proportion of water be increa Thick starch paste well worked into the back o the print will c perfect adherence to the mount.

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NOTICE OF REMOVAL.

JANUARY 1, 1898, THE OFFICES OF THE "BRITISH JOURNAL OF PHOTOGRAPHY" WILL BE REMOVED TO No. 24, WELLINGTON-STREET, STRAND, LONDON, W.C.

EX CATHEDRA.

OFESSOR GABRIEL LIPPMANN'S paper on *Colour Photography* urally drew a very large attendance to the meeting of the al Photographic Society, which took place at the rooms of Society of Arts, John-street, Adelphi, on Tuesday evening . It is nearly seven years—to be exact, February 2, 1891—e Professor Lippmann made a communication to the French démie des Sciences descriptive of his method of making tographs in colour by the development of images produced interference. In the early part of the present year the ncil of the Royal Photographic Society voted him the gress medal of the Society in recognition of his work. re is considerable disagreement among authorities as to ther Lippmann's process affords any substantial ground for hope that it may lead to the solution of the problem of producing photographs in natural colours in the camera, but of the undoubted beauty, and, in general, the fidelity of the results that were produced by Messrs. Lumière by the process, and shown by projection at the Society of Arts in October, 1893, there were no two opinions among those who then witnessed the demonstration. In another part of the JOURNAL appears a report of Professor Lippmann's lecture.

* * *

THE Lippmann process may be thus briefly outlined. An orthochromatic transparent film of gelatino-bromide of silver is made to form one side of a cell, film inwards, and the cell is filled with mercury, which forms a reflecting surface in contact with the film. The exposure is made through the glass and the image is brought out by alkaline development. Viewed by transmitted light, a negative image is seen; but, when seen by reflected light, the image being backed up with an opaque substance, the positive is seen in its proper colours. The remarkable part of the process is that the interference colours should be producible by development. Lippmann's original results were obtained with an exposure of, in some cases, hours; but Messrs. Lumière succeeded in considerably shortening the time of exposure, bringing it down, in one case, to four minutes, we believe.

* * *

PROFESSOR LIPPMANN'S lecture did not open up any new ground. It was devoted to an exposition of the theory and practice of the process. The theory was thus defined: "The use of the mercury mirror is to reflect back the incident coloured rays and thus make the incident light vibrations *stationary*. These stationary vibrations fall in the interior of the sensitive film and thus impress upon it their own structure. When fixed, dried, and examined by white light, the photographic deposit, though by itself colourless, has acquired the property of sending back to the eye those component parts of white light which have impressed it, and thus appears clothed in the same hues as the image in the camera. In the same way a phonograph works by giving back the sound vibrations which it has first inscribed." A number of photographs of flowers, views, &c., obtained by Professor Lippmann, were shown on the screen by opaque projection. These excited very great admiration, the colours being remarkably faithful and vivid. It was elicited that in one case—a view of Biarritz—the exposure given was one minute.

"NATURE" last week says thatt he first occasion upon which Röntgen rays were applied to surgical diagnosis was referred to by General Maurice in the course of a few remarks made at the close of a lecture delivered at the Royal Artillery Institution, Woolwich, by Mr. W. Webster. The credit of having first used the rays to determine whether a patient (who had severly injured his elbow) was suffering from a fracture or a dislocation has hitherto been given to Mr. Howard Marsh. It appears, however, that Mr. Marsh really only recommended the application of the rays to the case, and that the actual photograph was taken by Mr. Webster, who had been working for some time with Mr. T. Moore. The photograph showed distinctly that the injury was due to a dislocation, and was not a fracture at all. The diagnosis having been established, the operation of putting the arm in its place was performed by Captain Salvage, an army surgeon. Mr. Howard Marsh described the case in the *British Medical Journal;* but, says General Maurice, "as he was simply dealing with it as a scientific case, the names of Mr. Webster and Mr. Moore were, according to professional etiquette, necessarily omitted."

* * *

A MORNING newspaper narrates the following little photographic tragedy:—A "snap-shot" taken by an amateur Kodaker of a family group during the visit of the Tsar and Tsarita to Darmstadt has furnished a professional photographer with a popular picture that is likely to be a little displeasing to the French. In the group the Kaiser had his right arm thrown affectionately over the Tsar's left shoulder. The professional photographer skilfully detached these two figures from their surroundings, and made it look as though the two autocrats had purposely assumed so friendly a pose. These manipulated prints are selling freely in all the shops of the German capital, and a few days ago they made their appearance in the window of a dealer in St. Petersburg. The fact was at once notified to an exalted personage, and before nightfall a visit from the police ensued, the whole of the vendor's stock being summarily confiscated.

* * *

WE are indebted to a friend, Mr. G. E. Brown, of Swindon, who has a letter on the subject in our Correspondence columns this week, for a copy of a little pamphlet giving particulars of a proposed memorial to the late Henry Fox Talbot, assuredly one of the most, if not actually *the* most, renowned fathers of photography. The memorial suggested is the proposed restoration of the chancel of Lacock Church, Wiltshire, an idea first mooted soon after Fox Talbot's death, in 1878, but of which circumstances compelled the temporary abandonment. There is an obligation on the present lay rector, Mr. C. H. Talbot, to keep the chancel in repair. The present chancel was rebuilt in 1777, and is in substantial repair, but it is out of harmony with the rest of the church, and it is thought that, with the assistance of the photographic public, the defect may be remedied. Fox Talbot is buried in Lacock Cemetery.

* * *

A LOCAL Committee has been appointed to carry out the work of restoration, according to plans prepared by Mr. Harold Brakspear, A.R.I.B.A., Architect, which include the conversion of the chancel, the addition of an organ chamber, and the provision of the necessary fittings, at an estimated expense of 1000*l.* Any surplus that may be obtained would probably be applied to form the nucleus of a fabric fund, applicable to [illegible] part of the church or chancel, as the above-mentioned sum [illegible] no means represents the whole amount that might, with [illegible] vantage, be expended on the fabric, and which it must soo[illegible] or later require. The Treasurer is the Rev. H. W. Armstro[illegible] Lacock Vicarage, Chippenham, Wiltshire. We trust that [illegible] readers will support the efforts of Mr. Armstrong and [illegible] coadjutors to complete the memorial to one who, as is poin[illegible] out in the explanatory pamphlet before us, was not only [illegible] original and independent discoverer of photography, but [illegible] an eminent mathematician, classical scholar, and student [illegible] Eastern antiquities. Our French neighbours have gre[illegible] honoured the memory of Daguerre, both in his native to[illegible] and elsewhere, and there is now an opportunity for us [illegible] render like homage to one but for whose early work, in pa[illegible] negative and positive work, photography might not now e[illegible] in the form in which we now have it.

* * *

ON Tuesday evening, December 7, Sir William Croo[illegible], F.R.S., was the guest of the Camera Club at their mon[illegible] house dinner. The chair was taken by Prof. H. E. Armstr[illegible], F.R.S., and among those present were Prof. Thomson, F.R[illegible], Mr. Inwards, Pres. R. Met. Soc., Prof. Plimpton, Drs. Ge[illegible] Smith, Charters White, and Lindsay Johnson, Col. H.[illegible]e, Major Woolmer Williams, Messrs. Andrew Pringle, A[illegible], Webster, Cadett, Fuerst, and others. In a short speech [illegible] Chairman expressed his sense of the honour done to the [illegible] in entertaining a guest so distinguished for his scientific researches. Sir William Crookes, in his reply, said that he [illegible] particular pleasure in visiting the Camera Club, as he was [illegible] of the earliest experimenters in photography, in which he had commenced investigations fifty years ago. He humorously described some of the difficulties he experienced in those early days, especially at the time of the albumen process, which preceded the well-known wet-collodion process. Then the terror of dust was so great that the enthusiast not only took the precaution of wetting all the sides of the dark room, but also entered it himself in a state of nature, well sponged down in order to catch any particles of dust which might be floating around. At the invitation of the Hon. Secretary, on behalf of the Committee, Sir William, in a few well-chosen words expressed the pleasure it gave him to accept the invitation to become an honorary member of the Club, and his hope that he might be able to attend some of the lectures of the Club. The dinner concluded with a vote of thanks, proposed by Mr. Andrew Pringle, to the Chairman, who has always been distinguished by the active interest he has taken in the Club

THE GUM-BICHROMATE PROCESS.

II.

LAST week we referred to the resuscitation of the original carbon process of Pouncy, and to the fact that there is no novelty in the present method of working it, despite the silly name attempted to be foisted upon it. The process itself, as we then said, is capable of yielding excellent results in skilful hands as proved by the examples shown at the recent Crystal Palace Exhibition by the late Mr. John Pouncy's son, and also by those produced by Mr. Packham at the Photographic Club the other night. Many of those who have only seen the things shown, at times, at the Salon and other shows, have gone away with the general idea that it was a useless one when good

results were a consideration. Such, however, is not the case when it is skilfully worked. A few hints may now be useful to some who may be inclined to give the process a trial, in addition to Mr. Packham's paper.

First, the choice of the paper. Unless a suitable one be chosen, an even coating with the pigmented gum will not be obtained, and a more or less patchy picture will be the result. This difficulty was met with by Pouncy, and he overcame it by using an absorbent paper of the "plate-paper" character which he termed a slack-sized paper. The kinds mentioned by Mr. Packham, at his demonstration, are of this nature, and may be relied upon for the purpose. With highly glazed, or hard-sized papers, such as the Saxe and Rives photographic papers, a perfectly even coating is next to an impossibility. Now, the getting of an even coating of the pigmented gum, even on the most suitable paper, when in large sheets, is not an easy matter until some experience has been gained; but, by following the method demonstrated, at the Photographic Club, by Mr. Packham—which, by the way, is the same as that published by Pouncy, except that the former gentleman used a badger's-hair softener, and the latter a hog's-hair one—with a little practice no difficulty will be experienced. It should be kept in mind, however, that the pigmented coating should be worked into the superficial pores of the paper, and not be kept entirely on the surface.

There are two ways of sensitising the coating, and experimentalists should try both, as with some negatives they will get on better with the one than the other. One method is to add the bichromate of potash to the gum and pigment before applying it to the paper; the other is to sensitise the paper beforehand by immersing it in a saturated solution of the salt, and then dry it. In any case it is necessary that the paper itself be made sensitive to light as well as the pigmented coating on its surface. In the former of the two methods the paper absorbs the bichromate from the pigmented gum, and, in the latter, the pigmented gum gets the bichromate from the paper with which it is already saturated.

There is one point at which beginners are very prone to fail, namely, that of having the pigmented coating too opaque. It must be borne in mind that a very little pigment like vegetable black will go a very long way, and that, the finer the state of division it is in, the greater is its colouring power; also, that the light must penetrate through the coating and act on the sensitive paper beneath, except in the extreme high lights, and that cannot be the case if the coating contains too much pigment, or if it is in itself too thick. The coating should be such that a strong light can be seen through the paper when dry. If the coating is too highly pigmented or is applied too thickly, it becomes analogous to ordinary carbon tissue, with the result that, when the image is printed, it will have, except perhaps in the extreme high lights, an unacted upon, and consequently a soluble layer between it and the paper. As a result the half-tones and delicate tints will wash away in the development, leaving only "soot and whitewash" effects, such as some of those shown at one or two modern exhibitions. When the coating is of the proper thickness, the deepest shadows of the picture are distinctly visible, by transmitted light, when printed.

The best kind of negative for this process is a thin and delicate one. Hard negatives or those with excessive contrasts are not well suited for the gum-bichromate process except with a specially prepared paper.

With regard to the development of the image, if the finest detail and the best half-tones are desired, there is no question that the image should be allowed to develop itself by simply leaving the prints floating on cold water until it is sufficiently light, with, perhaps, occasionally gently laving a little of the water over its surface. The development may sometimes be aided by the careful use of a camel's-hair brush when the coating from age, or otherwise, is somewhat insoluble. Then even slightly warm water may be employed, but not when it is in the opposite condition, as then there will be a loss of some of the more delicate tints, owing to the image being of such a very tender nature. It is, under any conditions, very different from that of an ordinary carbon print and will not bear nearly the same treatment in the development. Hence the brush must be used with care. We are here assuming that a picture with the most perfect gradation, from the highest lights to the deepest shadows, is the object in view. Of course, if results such as some that have been shown at the Salon and elsewhere will be tolerated, then the brush may be more freely employed.

A suggestion was made the other night, at the Photographic Club, by one of the members (Mr. Foxlee) that is certainly worth a trial in connexion with this process. It was to sensitise the paper, then print it, and afterwards coat it with the pigmented gum, trusting to the continuating action of light, as in Marion's process, to complete the work. In this way one of the difficulties, with beginners, in carbon printing—the proper exposure—would be met, as the image, being a visible one, can be watched while printing. We can see other advantages in this method if it be a practical one.

Acetylene Generators.—Our contemporary, *La Nature*, has recently had some well-illustrated articles, by M. Pelissier, on the various forms of acetylene generators, some of the very latest novelties being discussed in a recent issue. The kind in which the calcium carbide falls into an excess of water has, in principle, many advantages; but their realisation is difficult and, the writer believes, not yet accomplished. When a small piece of carbide is thrown into a vessel full of water, there is but little gas produced, an excess being impossible; further, there can be no perceptible elevation of temperature. These are two great advantages, as any one conversant with the subject is aware. To realise in practice these good points, generators have been devised in which the gradual evolution of gas is brought about by having the carbide in powder and delivering it by mechanical means into the water as required. A difficulty arises from the substance not falling to the bottom of the tank, but remaining upon the surface, where it forms a cake or skin that arrests for a time the falling carbide, which quickly heats. Other inventors deliver the material in small pieces, to avoid this trouble, the pieces falling at once to the bottom of the water. A further mode of solving the difficulty consists in agglomerating the powdered carbide into pastiles, which can be made to fall in any required manner or number. Naturally these latter methods mean increase of expense, for the carbide is hard and difficult to break, while, as the powder offers so large a surface to the air, it readily absorbs moisture, to its detriment.

A New Acetylene Lamp and Small Generator.—A lamp primarily intended for bicycles, but possessing such features as would render it very useful for photographic work, has been placed upon the market by the Clowes Manufacturing Company of Waterbury, Connecticut, U.S.A. The whole lamp and generator occupies but little space, and the supplying of water to the carbide is capable of easy regulating by a small thumb piece. It is delivered virtually drop by drop, and the carbide, instead of being in lumps or powder, is first crushed, then with the addition of some foreign matter agglomerated into cakes, each forming a charge of so-

called carbrohene. These cakes of two different sizes are packed in air-tight boxes, two in a box; six boxes go to a "case," which is charged thirty cents., *i.e.* something like a penny farthing a cake. The flame is about an inch high when the lamp is at rest, and will continue for from one to six hours. The whole arrangement is made complete by the addition of a needle-pointed cleaner, for keeping the burner aperture quite clean and free from carbon. This deposit of carbon is a difficulty that acetylene burners are always liable to, but we have heard of a process, soon to be exploited, which will prevent this deposition, at the same time that the flame will be improved.

Light from Bodies below Red Heat.—It may be within the memory of our readers that, some years ago now, we drew attention to Herr Weber's discovery that a heated body below a red-heat glow emitted radiations that were perceptible to the eye —the term "grey-glow" was devised to describe them. Herr S. Lummer has been investigating the phenomenon, and appears to have proved that the effect is capable of a physiological rather than optical explanation. His theory is that the rods and cones of the retinal structure vary in their susceptibility to light, the former being alone capable of being excited by the grey glow, while the red glow excites the cones only.

Practical Surgical Radiography.—At a recent sitting of the Paris Academy of Sciences, MM. Rémy and Contremoulins described an apparatus for determining exactly the position of an object imbedded in some part of the body. They experimented upon the skull of a patient within whose cranium a bullet was lodged. The method consists in radiographing the head in two positions, and the trace thus obtained is projected upon the head by cranial compasses. In eleven preliminary experiments (which were made on the dead subject), the exact position of the bullets and even splinters of bone were determined with complete accuracy. Then the method was tried with a living person, the result being a complete success.

A Novel Mode of Electric Illumination.—This has been adopted in America, and may possibly have its use in photographic work. For portraiture, as is well known, the naked light is impossible; it is usually screened from view and placed in the focus of a large whitened screen, shaped like an umbrella, the reflected rays from the white surface alone being utilised. In the new method the reflecting agent consists of a huge ball, six feet in diameter, painted white, and hung in the centre of the room. Eight large electric arc lights are concealed from view in the corners of the room, and their rays projected upon the ball. The whole room is said to be sufficiently illuminated with a beautiful soft effulgency that does not at all fatigue the eyes.

The Modern Alchemist again.—Argentaurum reports still continue to reach us; the latest is as follows, as given in a "special" to a London daily. The report, as it reaches us, is to the effect that, between April and November last, nineteen ingots of gold have been produced from silver. Of these eighteen have been purchased by the United States Assay Office, and one by an English syndicate. The weight of the first ingot was, before melting, 7·06 ounces, and, after melting, 7·04 ounces. The result, after subjection to five processes in all, mechanical and chemical, was the production of gold, for which, after a small charge for refining, the United States Assay Office in New York paid $95·65. There remained a refractory proportion of silver, which is estimated at about twenty-six per cent. of the whole ingot. Mexican dollars, being of pure silver, with the very faintest trace, if any, of gold, are the favourite material employed by Mr. Emmens for the transmutation process. It must, in fairness, be admitted that the argentaurum idea, be it process or delusion, has been kept afloat for a far longer time than any previous transmutation process of modern times, though hitherto the alchemists have not flown for such high game as gold, silver quite sufficing for their purpose, and having been enough to enlist the cupidity of the inevitable dupes.

Detection of Hypo, &c.—MM. Alvarez and Jean have published some new methods of qualitative analysis, among them being processes for the detection of alkali sulphides, thiosulphates (hypo, &c.), and sulphites. Sulphides are tested for by sodium nitro-prusside, which gives a violet colouration. A portion of the solution is mixed with an ammoniacal solution of zinc oxide, heated to expel the ammonia, filtered, and the filtrate tested for sulphite and thiosulphate by adding first six times its bulk of ninety-five per cent. alcohol, and then, cautiously, a solution of bismuth sub nitrate or nitric acid. The presence of the thiosulphate is indicated by a dense yellowish-brown precipitate of bismuth thiosulphate; this is allowed to subside, and then more of the reagent is added, when a white precipitate is formed if a sulphite is present. The presence of a sulphite may also be detected by means of iodic acid, starch solution, and acetic acid.

BY THE WAY.

WINTER is upon us at last, and, although up to the time I write it has not yet exhibited any of its severe phases, we have, at least had a taste of the coming season. In the course of a drive of several miles, a day or two since, through a country district not specially attractive at ordinary times from a photographic point of view, I had frequent opportunities for regretting that I had not my camera with me. There had been a slight suspicion of snow; it could scarcely be called a "fall," for the ground showed no signs of it, but in an almost still atmosphere, following on the recent gale and with the temperature within one or two degrees of freezing point, the fine feathery flakes had collected on the trees and hedge rows, giving them just that light dressing of white, more nearly resembling hoar-frost than snow, that renders the best results in photograph.

I could as easily as not have taken my camera had I thought there would be a chance of using it, but the few drifting flakes of snow had scarcely attracted my attention before starting, which showed once more that those who wish to make snow or frost pictures must be ever on the alert, and ready to seize the first opportunity that offers immediately it presents itself. Frost effects are proverbially evanescent, and, when present, are usually accompanied by apparently unfavourable conditions of light and atmosphere, a dull light and a stagnant, fog-laden air; but the moment a current of air lifts or moves the mist, and the sun begins to struggle earthwards, so soon do the effects vanish, and in very few minutes all the winter beauty of the scene is gone. In the case of snow, it is only after a slight fall, or in the early stages, that really effective results are to be obtained, for, when everything is clothed in an even coat of white, the elements of a picture are entirely lost. Therefore I say it is necssary to be ever ready.

But with a hand camera ready charged it is not difficult to be constantly in a state of preparedness, and yet I think, in proportion to the numbers of camera workers that now exist, there are few attempts at snow scenes than there were ten or fifteen years ago before the rage for hand cameras started. In the course of the drive above alluded to I came across three cameras at work, the smallest of which was, I think, whole-plate, and one that somebody had described as the "lordly 12 × 10," or even larger; which, perhaps goes to prove that the vast body of snap-shotters are not, as a rule the most energetic workers under difficult or uncomfortable circumstances; for it must be confessed that outdoor photography in winter time does not present the attractions to a comfort-loving worker that a bright summer day does, for, under the most favourable conditions, it is cold work standing about, perhaps over the boot tops in snow, and with the fingers so numb that it is difficult to handle the focussing pinion, find the stops, or even to "touch the button" without "doing the rest."

Then, again, "doing the rest," *i.e.*, the necessary development that completes a successful exposure, is anything but comfortable work unless your dark room is fitted on a scale that I fear has not yet become very general. It is not every amateur, or even professional

hat can manage to keep up a summer temperature in the developing oom when things outside are degrees below freezing, and even those who are careful enough, for purely practical reasons, to temper the oldness of the developing solutions can scarcely extend that pre-aution to the washing water; and it does not take long, under such onditions, to discover that the fingers have not much feeling of a useful character left in them, and that the handling of plates, dishes, and developing glasses requires more than usual care in order to avoid accidents. For which very good reasons a large proportion of the fair-weather hand-camera players knock off work for the season and go into other pursuits.

But for those who want "effects," and not merely the "usual thing," which seems to be going out of fashion everywhere, surely the winter offers better opportunities than can be found, save under exceptional circumstances, at any other period. Better opportunities, because the effects can be secured in very many cases without any artificial manipulating or "faking;" better, because, if a little study be given to the particular class of subjects, they may be so chosen as to yield results which, while sufficiently removed from the "usual" style to satisfy the most up-to-date, are yet perfectly natural. My readers may remember that I alluded to this phase of photography some months ago—during last winter—pointing out that many exposures on snow scenes are developed and probably thrown aside as failures, simply because they do not conform to the ordinary rules, as regards appearance, of a good or even a decent negative. It has to be learnt by practical experience that a negative that is capable of yielding a good print of a snow scene, *i.e.*, one that really gives an idea of snow or frost, as the case may be, and not of heaps of cotton-wool or patches of bare paper, must necessarily itself look very different from one in which the gamut of gradation extends from cloud and sky to the deepest shadows of sunlit foliage.

Then, again, the atmospheric conditions that so frequently prevail, as already mentioned, when snow and frost are about, are so utterly unfavourable and discouraging when judged from a summer standpoint that many would-be workers are deterred from attempting an exposure at, perhaps, the very time when they might reap their richest reward. Time was—and that not so far back as the days of collodion dry plates—when scarcely any length of exposure sufficed to yield a printable negative in the dull light of a winter's day; but now, with plates of fairly rapid grade, especially if orthochromatic, the winter light presents no greater difficulty than that of summer, and even fog becomes, to some extent, a negligeable quantity. I am speaking, of course, of where pictorial effects are sought, for obviously, with ever so slight a frost haze about, it is impossible to get a bright, clear view, such as would be the result in summer. But, when winter scenes with "atmosphere" are the object, some mist must almost be said to be a *sine-quâ-non*. Of course, it will be understood that to expect the camera to penetrate a fog that is sufficiently dense to obscure ocular vision would be absurd, but there is a wide enough margin between the crisp clearness of a hard "black" frost and the moderate haze of a "white" to exercise the skill and satisfy the aspirations of the careful picture-maker.

Speaking of warming the developing solutions, I had a little object-lesson the other day, not only in the importance of that operation, but also in the fatal ease with which it is possible to be led astray by tricks of the weather. I had a number of negatives to develop that had been exposed during the fine weather, that has almost constituted an Indian summer, and some of them had been developed on a day which, to all intents and purposes, might have dropped out of early June, instead of being nearly at the end of November. These were all right. The night brought our first frost, or, at least, the first of any importance, but the next day was as sunny and genial as the previous one, with not an outward symptom of winter about it. It was under these conditions that my developing operations were resumed, and, to my astonishment, the first negative appeared hopelessly under-exposed, and, but for the accidental circumstance of its being that one particular plate, it, and probably others, would have suffered. But it so happened that this was a duplicate exposure made in the belief that I had moved the camera, and its fellow had been the last plate developed on the previous day, and a perfectly exposed plate. Evidently, then, it was not under-exposed. Then I remembered the frost; so, pouring away the developer, I "tepidised" (good word!) a jug of water, filled up the developing dish while I was mixing a fresh batch of developer, just to warm the negative, and then proceeded. Result—the image came up at once as easily as on the previous day.

In this case it was not the temperature of the atmosphere at the time that made the difference, and equally certainly it was not the frost in the night that had affected the plate; but it *was* the effect of the frost upon the water supply. This, in spite of the deceptive geniality of the outer weather, had received such a chill that it would have taken many such days to restore it to its condition of yesterday. I mention this incident to show, for one thing, how insidiously our winter troubles may creep upon us, and how, if we have not our eyes *very* wide open, we may come to grief without knowing exactly the reason why; and, secondly, in order to point out that it is not the prevailing atmospheric temperature that affects the rapidity or otherwise of development, but the more equable and slowly changing water. Cold and comparatively warm days may alternate with the happy carelessness our climate knows so well, but our water supply, from whatever source obtained, goes gradually down in temperature as the winter advances, and it is far too consistent in its behaviour to "give itself away" by returning to summer temperature because one spring day has come masquerading out of place. Water is steady in its habits, and, though slow in making up its mind on matters of temperature, it is on that account perhaps more reliable. If any one will take the trouble to notice, he will find that his water supply will bear a little warming with advantage to development long after the spring weather has become genial; and, further, if, as we sometimes have, a very cold day, or even a frost, should come in June or July, it makes little or no difference in the time of development, for the same reason that one warm day in winter does not remove the necessity for artificial warming.

Those who, from motives of economy—for it can be on no other reasonable ground—still keep to the use of ordinary plates in winter, are the ones who should be most particularly careful on the score of temperature of their water, for slow plates suffer much much more quickly and more seriously than very quick ones. In fact, it is the question of temperature, perhaps, quite as much as that of light, which renders an ordinary plate quite fit for studio use in summer, and wholly useless in winter. This is a "tip" that may prove useful to many; at least, I can vouch for its having been a "revelation" to more than one worker of slow plates, and, strange to say, there are some who will stick to slow plates, *not* from motives of economy, but who would rather pay a long price for slow plates that they could work in winter than have "extra rapids" at "popular prices."

DOGBERRY.

EXHIBITION OF THE LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual competition of this Society was held last week, and after the adjudication of the medals the pictures were hung and the Exhibition was opened to members and friends. On the present occasion the Society, with advantage, as the event showed, made an entirely new departure in their scheme of competition; and our opinion coincides with the Judges, that the results proved the wisdom of their decision. Hitherto, in common with many other photographic societies, the pictures to be sent in for competition were divided into a large number of classes—landscape, portrait, large, small, snap-shot, and so forth. For the present Exhibition the pictures had only two divisions in addition to the special ones of stereoscopic view and lantern slides, the first open to all members, the second to those who had never previously gained a medal. There was also one challenge gold medal, the medal to be absolutely held by a winner three times, for the best set in either class, and a silver medal given by the President for a lady members' competition—the best set of flower and print studies. In each of the two classes there were three silver, and an equal number of bronze medals. There was, it

should be noted, a further alteration, in that four pictures instead of six, as heretofore, constituted a "set."

We may say that the Association is to be congratulated upon the high standard of the pictures sent, many of them being well up to the Royal form, and we trust that we shall meet some of them again at Pall Mall next year. Mr. Chas. F. Depru, the winner of the gold medal, quite a recent convert to photography, has every reason to be proud of his success. His four works were all studies from the life—female heads, and show a freedom and individuality of treatment which will place him in the first rank. The subjects bore no title, but we marked with special approval a powerful bust with fine modelling, the head being thrown up and backward, yet without strain. A second study in low tone showed the advantage of choosing a good model, the wrapt expression being well caught.

The President of the Association was successful in obtaining a silver medal for four studies in sepia, a quiet low-toned view of Antwerp, a quiet landscape composed of a river bend and foreground of sedges, being his best. Mr. T. E. Wilson (silver medal) had in his four two beautiful studies printed in a rather hot Indian red tone. His *Departing Day*, showing a bright sunset sky behind trees dexterously reflected in a pool, is a picture in every sense, and by its side is a companion picture in the same key almost as effective. An interior—*Chester Cathedral*—in this set is commonplace.

Mr. E. Sunnett (silver medal) gives us in *On the Welsh Coast* grass-covered sand dunes with a peep of ocean and low distant hills—a clever picture, clouds a little heavy. *In Leafy Arches Twine the Shady Groves* is a very fine forest study, a winding path past noble boles of great trees leading the eye into a depth of leafage with picturesque effect. *The Stile*, a print in warm sepia, a little wanting in relief, is, nevertheless, distinctly good.

The bronze medal pictures in the same class are worthy of distinction. An excellent set of Röntgen ray prints, by Dr. C. T. Holland, enabled the Society to recognise the scientific aspect of photography, while Mr. John Bushby's works in a sepia tone were restful, quiet, and picturesque, the *Island in Cattaro Bay, Dalmatia*, being one of the best. The view of a *Defile in Bosnia* gives a suggestion of largeness and grandeur in the mountain side not often seen in this kind of view. Another view of stream and delicate leaf and stem cut against the sky is pretty, and perhaps not improved by a heron standing in the water, the same bird appearing in another part of the Exhibition in an entirely different view. We wonder how he carried that bird.

Portraiture is unusually well represented for amateurs. Mr. E. R. Dibdin's set contains two good pictures, a head of Mr. Finnie, the artist, and a study of a lady in profile, wanting in tone a little.

The class for those who had never before taken a medal was well filled, though there were fewer competitors than in the first. The pictures, too, were mostly of smaller dimensions.

Mr. F. H. Elsby (silver medal) has four small but striking pictures. One a dark landscape with a cow outlined against the sky is a bold and successful picture, and another view, the prominent feature of which is a row of trees looking dark in a sombre light, is very telling. Mr. J. Parkinson (silver medal) gives us some pretty views in the Isle of Man, notably a view of *Peel Harbour*, taken with the main source of light in front of the camera; the hulls and masts of the vessels against the distant walls well aid the effect of the air clearing after a shower, and his *Peel River in Glen Meay* in an entirely different mood is a very pretty view. Mr. W. A. Taylor (silver medal) gives us four exquisite tiny pictures full of pearly greys, and, as becomes their size, treated with minuteness of detail, yet not to mar their exquisite vignette-like effect. The only fault we find is the slightly too deep printing, especially in the skies.

In the bronze medallists we have Dr. Napier, whose view of Peel Castle darkly silhouetted against a dark sky with the last blaze of departing day in the horizon, though very small, is a great success; of his set we cared only for the *Peel Castle* and *Raby Port*, that much photographed but pretty spot; also Mr. F. W. Barritt, whose forest scene is probably taken at the same time and from a somewhat similar standpoint as Mr. Sunnett's, and has many of the merits of the latter. His *Hellne Beach*, a long stretch of sandy shore and sea, with figures, is a clever composition and an effective picture. Lastly, Mr. C. Gostenhopher's set of *Valle Crucis* and *Bridge End* is composed of four pretty pictures of uniform quality.

There were only three competitors for the President's medal for lady members, and the prints were not of large size; but Miss Harvey's silver medal pictures would have been well earned in a very large class, for their artistic and beautiful effect and the gracefulness of composition out of few and simple materials.

The Judges wisely suggested a bronze medal for another set (Mrs. Bell's), in which the fruit, &c., were tastefully arranged and composed, though without such accessories as made pictures of the others. For actual technique perhaps Mrs. Bell's deserved premier honours. The Liverpool men know how to make lantern slides, and many of the sets competing contained splendid slides, few of them, however, having the whole six up to the same high standard. But Mr. William Harvey, who gained a silver medal, had six slides, each of which was a perfect gem, and Mr. H. Holt's six were not far below them.

The stereoscopic slides (glass) were very good, but did not attain the high standard of the lantern slides, the Rev. W. Smith's (silver medal) being decidedly the best, and Mr. E. Simnett's not much behind.

It would not, in the limited space at our command, be possible to do justice to all the pictures shown; but we may note some without disparagement to others. Portraits, as we have said, are to the fore, and Miss Collie has a study of a girl in gipsy dress that would discredit no professional. Among general subjects, we must notice a set of four seascapes (printed in blue) by Mr. Appleby, sameness of subject alone, we should imagine, having prevented a medal being given. Dr. Llewllyn Morgan has refined, quiet view—a water scene with foreground of sedges and distant trees. Mr. H. Holt in the *Trossachs* shows a valley studded with trees in which the varied colours of greens are suggested with unusual truth with an entire absence of the spottiness and undue contrast so usual with this class of subject. Mr. A. C. Batty's view with ferns in foreground and a tree-covered hillside is pretty, and Miss Langton's mud banks, lightened by a cleverly selected pool of water with distant bushes is an excellent example of picture-making out of the most unpromising materials.

Mr. Grillon's sea piece in dark sepia should not be missed, nor Mr. W. A. Taylor's little picture like a cutting from an old illustrated annual. Mr. Dibdin has another set of portraits which embrace some of the subjects in his medalled set, but printed in a different colour. Another set of portraits by Mr. Depru shows a distinct aim nearly achieved, a nearly life-size girl's head in a hat with flowers which are apparently an after-addition, perhaps by hand. In endeavouring to prevent the shadows printing too heavy, they have become a little spotty. Mr. Mumford's interiors deserve special mention, and the last President, Mr. Brown, sends a set of four pictures of even merit.

Mr. Bushby has a print by the Artigue process representing a waterfall with a human figure standing all conspicuous in front. Also another—the heron again. We may note, in conclusion, that there were very few albumenised paper prints shown, platinotype and Mariona paper, in all shades from fiery warm browns to cool greys, almost dividing the honours.

[The following Articles were received too late for the ALMANAC.]

UNCONSIDERED TRIFLES.

By WALTER A. LOCKS.

WHAT do you do with your old celluloid films? I suppose you, gentle reader, like the rest of us, do *occasionally* get a spoilt negative. An excellent method of utilising them is to remove the emulsion, and to use the films for squeegeeing gelatino-chloride or enamel bromide prints to, in order to secure that high gloss so beloved of snap-shooters. They require no French chalk, and the prints never stick. If you once use films you will never use glass again for this purpose. Most bromide workers have experienced the annoyance of finding the edges of their prints covered with markings and stains. This is particularly noticeable with a stale developer, or when a mask is used and a blank margin left around the picture. Various clearing baths have been recommended from time to time, but I have found the following plan answer; its simplicity is obvious. I take a piece of ferricyanide of potassium about the size of a pea, and drop it into a two-drachm measuring glass containing a drachm of water. After letting it stand for a moment, I dip into this a weak solution a mop camel's-hair brush, and go lightly over the margin of the print with it. The effect is seen immediately. Wherever the brush has touched, the paper is left as white as snow, all marks disappearing as if by magic. Care should be taken to hold the print at the bottom of a shallow dish in such a manner that none of the solution will flow over the picture, or you will find part of the latter dissolved.

Talking of masks, these should always be at hand for use in connexion with snap-shots where it is necessary, occasionally, to mask out parts which were not originally intended to appear in the picture. A shilling box will last you for years.

Pretty effects may often be obtained, even in the humble quarter-plate prints, by using rough bromide instead of the smooth or glossy paper so much in vogue. Bits of landscape are particularly suitable for this treatment, and it is surprising to see how pictures may be made from negatives which would yield a mere common-place print on P.O.P. White specks can be spotted out on this paper with ordinary lead pencil without the marks showing—at least, this is the case with the Pageant rough paper.

Have you ever lost your lens cap, and been unable to secure another in the town where you were staying? I have, and my experience may be worth having. I went to a local chemist, explained my difficulty, and within three minutes he had provided me with the lid of a cardboard pill box, which was just a trifle large for the lens. I invested a penny in a bottle of gum, begged a piece of black cloth, and soon had a lens cap which fitted accurately, and was quite equal to the one I had lost. In fact, I liked it so well that I have used it ever since! If you are ever in the same fix, go and do likewise.

LOCAL REDUCTION OF NEGATIVES AND LANTERN SLIDES.

By Joseph Earp.

I have for many years used spirits of wine as a local reducer, but I have found—as who has not?—that the process was a very tedious one, the amount of rubbing required being considerable before any appreciable reduction could be observed. I have now discarded alcohol for the purpose, and use instead a metal polish sold under the name of Scouree. It is a stiffish paste, and, if a little is taken up on the finger or upon the finger covered with a little soft linen or chamois leather, and rubbed on the negative with a gentle pressure, reduction will be effected with remarkable ease. I have frequently used it on the sky portion of a delicate lantern slide without any sign of a scratch showing on the lantern screen. When sufficient reduction has been effected, the Scouree is simply polished off with a clean bit of linen. This method of reduction is decidedly preferable to the use of ferricyanide of potassium; the latter must be followed by a thorough washing of the negative, and the lapse of some hours before the negative is dry and ready for use. Scouree is sold in 1*d.* and 2*d.* tins at almost any grocer's shop. In case any difficulty should be found in obtaining it, I may mention that the boxes bear upon them the words, "Prepared by J. W. Grady & Co., J. L. Duguid & Co., Liverpool." It is quite possible that other metal polishes may be found to answer the purpose equally as well. I have tried only one other, but it was not equal to Scouree for the purpose.

INTENSIFICATION.

By H. W. Bennett, F.R.P.S.

In intensifying negatives mercury is probably far more extensively used than all other reagents. It is difficult to understand why this should be so, since so many objections can fairly be urged against it. Its most serious fault is uncertainty, it being impossible to tell definitely what the final result of intensifying will be, however carefully and systematically the work may be performed. Two plates by different makers, of apparently equal printing density, bleached in the same solution of bichloride of mercury, and blackened together either in a solution of sodium sulphite or of ammonia, will differ very considerably after drying; and even two plates of the same make and speed, if one is thin from under-exposure and forced development, and the other from over-exposure and restraining, though identically treated, will show fully as great a difference in their final result. Mr. Chapman Jones, in a paper read before the Royal Photographic Society, stated, as the result of many experiments, that mercury followed by ferrous oxalate could be depended upon to give a definite and constant increase of density; but that, in order to attain this constancy, the negative to be intensified must be absolutely free from any other substance than pure silver and pure gelatine, a condition that scarcely ever exists in ordinary practice. A negative that is at all brown in the colour of its deposit, or in any degree stained, is sufficiently removed from the required state to again introduce this element of uncertainty. This objection mainly consists in the fact that two independent operations are necessary to obtain increase of density, and, until the second of these operations is completed, the result of the whole process is a thoroughly unknown quantity.

Assuming that this ideal condition necessary to secure a constant result could always be obtained, the objection to this form of intensification still remains. A constant and definite increase of density obtainable, and no other, is not a desirable quality for an intensifier to possess. A perfect intensifier should allow a gradual building up of the image from extreme thinness to excessive density if necessary, or, equally well, allow the operation to cease at any intermediate stage, and in either case allow perfect control. It may frequently happen that a negative is almost all that could be desired, but a slight additional density would be an improvement; there would naturally exist a strong disinclination to risk the probability of an undesirable increase; or the opposite, a plate might be so thin that several treatments were necessary to give it good printing value, and then the number of operations, and the thorough washing necessary at every stage, would involve a serious loss of time, in addition to a considerable amount of work, before the final attainment of the desired density. It may be contended that, in the hands of a careful worker, a plate should never be so far from the desired quality as to require such treatment; but it must be remembered that there are many cases in which the character of the work or special circumstances prevent a photographer from obtaining the quality of negative that he can easily secure under normal conditions, however skilful he may be, and he is forced to resort to after-treatment, and it is to meet such abnormal cases that a perfect intensifier is needed. Even under ordinary circumstances, it is not practicable to always secure exactly that degree of density that best represents the subject.

It is surprising that more attention has not been given to intensifying by means of silver. It is not only the most suitable and natural substance that should be selected, but in practice it is free from the objections that can fairly be urged against the use of mercury. The most satisfactory and certain method of silver intensification with which I am acquainted is that introduced about seven years ago by Mr. J. B. B. Wellington, and published by him in The British Journal Photographic Almanac, though it has apparently received but little attention. I have scarcely ever met a photographer who has taken the trouble to try it, though in my own practice, and that of a few to whom I have given particulars, it has been all that could be desired.

Two stock solutions are made,

No. 1.

Silver nitrate	¼ ounce.
Water	3 ounces.

No. 2.

Ammonium sulphocyanide	½ ounce.
Hyposulphite of soda	½ ,,
Water to make	3 ounces.

When required, take approximately equal quantities of each, and add No. 2 to No. 1 until the precipitate first formed is just redissolved, and to each ounce of the mixed solution add about three grains of pyro with sulphite from ordinary stock solution, four or five minims of ammonia with a grain or half a grain of bromide, and in this mixture redevelop the plate until sufficient density is obtained.

I have found it better when only a slight or moderate increase of density is desired, to dilute the mixed solution to two or three times its original volume with water, it is then more under control, as it is very energetic; but, for a thin negative that requires a very decided improvement, it is best used of full strength. The plate gains in intensity on drying, for which allowance must be made; as a rule from five to seven minutes will be sufficient for any negative, and its gradual building up can be carefully watched and stopped at any moment. After intensifying, it should be placed in a clean fixing bath for about five minutes, and then washed in the ordinary manner.

This intensifier is used after fixing, and it has this advantage over most, that a thorough washing before intensifying is not necessary; this is evident from the fact that it contains hyposulphite of soda.

There is one very necessary precaution to be taken. The negative, previous to being intensified, should be placed for two or three minutes in a bath of chrome alum (strength eight to ten grains to the ounce), otherwise with some plates there is a great risk of frilling, owing to the softening action of the sulphocyanide on the gelatine.

No photographer who has used this method of intensification would ever return to mercury. A negative treated with it has exactly the appearance and quality that it had before, plus the gain in density; a lantern slide loses none of the brilliancy of its lights, nor does it change materially in colour.

FILMS.

By William Ouin.

What rapid strides photography has made during the last twenty or thirty years! I can well remember my first attempts as an amateur. There were no films in those "good old days," and dry plates were few and far between. We knew more about wet plates then, and my experience with the bath was not always very pleasing. On one occasion I remember going to a friend's house, with the object of taking some portraits, and, of course, had to take my silver bath with me. Apparently all went on fairly well, that is to say, for an unassuming amateur; but, alas! not very long after, I heard that certain white cloths had got stained, and it was at once put down to my unfortunate bath. The introduction of dry plates was a boon both to the professional and amateur photographer, certainly to amateurs, for they undoubtedly gave an impetus to many to join their ranks, which to-day may be numbered by hundreds. Nevertheless, dry plates have their drawbacks. In the first place, they are heavy if you want to take out a dozen or two, and, secondly, they are very brittle, and it is very annoying to get a good negative broken, especially if it is one that cannot be taken again or replaced. But while we do not despise the dry plate, of which there are so many brands in the market, we are glad to hail a new departure in the welcome film, and, amongst other reasons, for the following, viz., (*a*) You can take, if you desire, half a hundred or more away with you on a tour, or in your holidays at the seaside or in the country, and stow them away without the slightest difficulty, and without adding much more weight to your luggage; (*b*) you need not fear breakage on your journey; and, lastly, you can easily repack them after exposure. There are three or four different films on the market, the best known being the Eastman and those manufactured by Mr. Austin Edwards. I have practically experimented with those sent out by the latter maker, and am satisfied as to their capability of giving good negatives.

Now, what may be done with glass negatives may also be done with film negatives. You can make transparencies from them precisely in the same way as you would from glass. Of this class of work some fine examples were shown in November last by the Eastman Company at their exhibition of Kodak pictures in Regent-street; some, indeed, I considered exceptionally good, and I was informed that they had been made from films. These lantern transparencies were a good illustration of what may be done in this direction, and certainly a stimulant to the amateur to give this branch of photography some study.

Besides this, good enlargements may be made from film negatives; and, at the Exhibition above referred to, some good specimens were exhibited, and what may be done by one firm, or, one individual, may,

under same conditions, be done by another, and even improved upon. "Experience," says the proverb, "makes perfect;" therefore it is certainly to the advantage of those who desire to do the best work to note the experience of others, and to persevere themselves until they attain the same, or even better, results.

With regard to the various manipulations in developing, fixing, washing, &c., these are the same as with ordinary glass negatives, care and attention being paid to the directions given by the makers of the different brands you may use. Any standard developer may be used, but the best are pyro or hydroquinone; but if you do not care, or have not the time, to make your own, you can obtain an excellent all-round developer, known as the "pink developer,"* which I have used for both films and plates, and therefore can speak with confidence as to its qualities and adaptability to all kinds of work. Moreover, I have found it very economical, a point worthy of the amateur's consideration.

There is no doubt but that the hand camera has had a great influence in bringing films to the front, as with the Kodak and Frena you can go out loaded with some forty or fifty films, an advantage you cannot get with the ordinary camera; and there is no doubt that they will become, in the near future, an indispensable part of the luggage of every tourist, and the accompanying friend of every artist in search of life in his studies of the picturesque and beautiful.

NOTE ON UNSHRINKABLE PAPER.

By Edmund J. Mills, D.Sc., F.R.S.

It is frequently desirable that photographic printing paper should pass through an ordinary series of processes without shrinking, so that the positive print may be an exact counterpart of the negative.

I have felt very strongly, especially in connexion with photographic surveying, the great need for a paper of this kind; which, so far as I know, is not at present on the market. As the result of a variety of experiments, I have arrived at the following method of preparing it:—Sheets of Eastman bromide paper are soaked for about fifteen minutes in a two per cent. solution of formalin; drained, and dried by a gentle heat (*e.g.*, over the dark-room lamp). The paper is then printed on and developed in the usual way (I use amidol for this purpose); fixing and washing follows. On drying in a warm room, the paper retains the dimensions of the original negative.

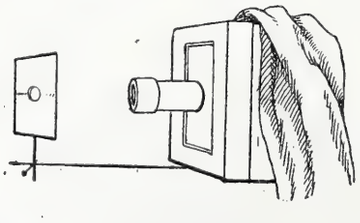
Some alteration products of, or impurities in, the formalin find their way to the edges of the paper. Hence it is necessary to work with paper a size larger than the negative.

HOW TO MAKE VIGNETTES DIRECT ON THE NEGATIVE.

By F. Whaley.

Often the question has been discussed as to making the negative to vignette direct without the arrangement of vignetting in the printing frame.

The sketch below will be seen at a glance, and can be made by yourself, only costing a few pence. The frame contains the vignette, an



ordinary picture frame will do admirably, then take a piece of white ground glass or opal to fit inside, cutting it through the centre (see line in sketch) and, finally, cutting the two half pieces the desired shape, about three inches, afterwards placing the two together.

The screen must be made to rise and fall according to the position of sitter, and fastened with a screw, also to move to and from the camera as desired, according to the size of vignette required.

Our Editorial Table.

Photo-Mechanical Processes.

By W. T. Wilkinson. London: Hampton & Co., 13, Cursitor-street.

A second edition of Mr. Wilkinson's book has been issued. The author has rewritten the section relating to photo-zincography in half-tone, and, by the addition of one on three-colour work and an appendix, has brought the book up to date. He also states that nothing has been written that has not been thoroughly tested. The scope of the book embraces line and half-tone work and collotype, and the information appears to be very exhaustive. A few more illustrations of the essential apparatus required in the various processes described would, however, have been an advantage. Perhaps the omission may be borne in mind when a future edition is called for. Mr. Wilkinson has had a long experience in photo-mechanical work, so that his book should be additionally useful to the student on that account. We note that he undertakes to give instruction in any of the processes described. His address is 19, Queen-street, Wakefield.

Two useful little books, compiled by Mr. F. Dundas Todd, editor of the *Photo Beacon*, have been sent us by the publishers, the *Photo-Beacon* Company of Chicago. The first is entitled *Second Step in Photography*, and is the sequel to a less advanced book. It is full of concise and well-selected information, and will be found of real assistance by the student. The second volume, *A Reference-book of Practical Photography*, is in some respects complementary to the first, containing as it does many valuable hints on the care and manipulation of apparatus, with a chapter on artistic photography. We can recommend both these little productions.

Photographic Mosaics for 1898.

Edited by Edward L. Wilson. New York: E. L. Wilson. London: Dawbarn & Ward.

Mr. Wilson's little annual bears the same agreeable aspect as hitherto, though the editor, in his preface, tells us that he has endeavoured to include, in addition to the usual review and practical papers, a representative collection of the best photographs of the year, limiting the field almost exclusively to American work. "Mosaics" consists of some 300 pages of articles and about forty half-tone reproductions of American portraits that are well worth scrutiny. The book is admirably printed and got up, and contains much that is calculated to be informative and useful to photographers.

Photo-Aquatint and Photogravure.

By Thomas Huson, R.I., R E. London: Dawbarn & Ward.

Mr. Huson employs the term "photo-aquatint" to distinguish his modification of the photogravure process from that ordinarily known and practised as the Talbot-Klic process. The points of dissimilarity are made clear in Chapter IX., in which Mr. Huson remarks that the chief difference in the practice of the two processes lies in the different qualities of transparency which each requires, and the way in which the etching of the plates is managed. He goes on to observe that at some point or other of the process of photo-aquatint or photogravure one has to surmount the difficulty of getting into the plate correct gradation combined with full range of tone, and it seems to him easier and better to do this at the transparency stage where one has the picture before one, and can see . . . . that it is right before going any further, than to use a transparency imperfect in range of tone, and then attempt to correct this by the etching solutions. This comparison briefly puts the reader in possession of the direction in which Mr. Huson has modified the process. The book, which is embellished by one or two admirable illustrations, is a mine of well-digested information by one who is obviously a master of his work. As an appendix, it has a treatise on machine-printed photogravure, and is, on the whole, a most valuable contribution to the literature of the subject.

Catalogue Received.

The Thornton-Pickard Manufacturing Company, Altrincham.

We have received from the Thornton-Pickard Manufacturing Company, Limited, Altrincham, an advance copy of their new 1898 illustrated catalogue, which is got up in the usual admirable style always employed by this well-known firm. We can readily believe the statement which appears in the introduction of the catalogue, "that the sales for 1897 again show an enormous increase upon previous records;" and we have no doubt that the record will again be beaten in 1898. As is well known, the products of this firm are reliable, substantial, and in every way satisfactory, and it is a pleasure to us to look through this new catalogue (the best yet issued by the Company), and note the particulars respecting new apparatus for 1898, among which we find: A new size of the Amber Camera (5×4); the New Patent Film-carrier, already noticed in

* To be had of Mr. Austin Edwards, Park, Tottenham.

ıe columns; a New Aluminium Shutter, specially designed to ıt the requirements of those who cannot afford to purchase the ndard Pattern Shutter; also full particulars of the competition 200*l.* in prizes. A copy of the catalogue will be sent free by ; on application to the Company at the above address.

News and Notes.

HE Photo-Autocopyist Company, late of 42, London Wall, E.C., have oved to 64, Queen Victoria-street, E.C.

SSOCIATION BELGE DE PHOTOGRAPHIE.—The Third Exhibition of Art otography is to be held at the Cercle Artistique et Littéraire, Brussels, n May 1 to May 31, 1898.

OYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, Deıber 21, at 12, Hanover-square, at 8 p m. *Photo mechanical Printing in nnexion with the Survey of India*, by Colonel Waterhouse.

A HUMAN BAROMETER.—A German scientific journal states that there is a se in the Polyclinic at Vienna whose hair is a certain indication of changes the weather. During dry, warm weather it remains a bright yellow, but, soon as the barometer begins to fall, it rapidly changes to a dark auburn.

THE LUDLOW PHOTOGRAPHIC SOCIETY.—Mr. J. H. Williams, the Hon. retary, writes: "At the last meeting of the Ludlow Photographic Society, cember 1, it was unanimously resolved that Mr. H. P. Robinson be asked be the first President of the Society, and I have much pleasure in saying at Mr. Robinson has accepted the office."

MAXIM CARBIDE PROCESS AND ACETYLENE GAS SYNDICATE, LIMITED.—This mpany was registered on November 23, with a capital of 2500*l.*, in 1*l.* ares, to enter into an agreement with John T. Carrington, and to acquire, velop, turn to account, work, and deal with Hudson Maxim's patented inntions connected with the manufacture of calcium carbide or acetylene gas. ıe number of Directors is not to be less than three nor more than six. The bscribers are to appoint the first. Qualification, 50*l.*; remuneration, 500*l.* r annum, divided between them.

MANUFACTURE OF WHITE OPAQUE COLOURS BY THE USE OF TUNGSTATES.—ıose tungstates which are slightly soluble or insoluble in water, and give no loured sulphides with hydrogen sulphide, preferably the tungstates of the rthy alkalies, are now employed in Germany as oil, size, and water colours. specially tungstate of lime and tungstate of zinc are recommended as white aque pigments. The various tungstates of the same metal (*e.g.*, calcium) have alike, and their quality as white opaque colour is not affected by their fferent percentage of water. Tungstate of lime possesses the covering power white lead, but remains white to sulphide of hydrogen and similar subances, while white lead turns brown. These tungstates can be used as size lours and water colours, another advantage over white lead.

THE Woodford Photographic Society held its Fourth Annual Exhibition at ıe club-room on Friday and Saturday last. The attendance was very good ıroughout the whole of the time the Exhibition was open. All the principal ıembers exhibited, and, as usual, a few pictures stood out conspicuously bove the rest. Mr. H. W. Bennett had some fine work on show, three architectural subjects being much admired. Mr. Malby was at his best with two loud effects and some flower studies. Mr. Marriage showed a number of ictures of various subjects, his architectural details being by far the best. Ir. Wilmer had a couple of photogravures, well known to frequenters of this ear's Pall Mall Exhibition. Mr. Emler (the Secretary) contributed about a ozen frames, three being enlargements; the subjects were mostly pretty ttle bits of Yorkshire or Epping Forest scenery. Mr. Noble only had two ames this year, but both were of high merit. The President (Mr. E. B. aird) was well represented by a number of bromide enlargements. The xhibition was greatly improved by the addition of the Affiliation Committee's ravelling collection of pictures. The transparency stand came in for a good eal of attention, and was quite a feature of the show.

MR. J. LIZARS, of Glasgow, announces a series of competitions confined to hotographs taken with his Challenge cameras. They are open only to resients in Great Britain and Ireland, and those in the employment of the rm are not allowed to compete. There is no entrance fee. The following re particulars of the open classes:—A (Competition for three photographs, ny subject): First prize, 30*l.*; second, 14*l.*; third, 7*l.*; fourth, 4*l.*; fifth, 2*l.* wenty prizes in all. B (Open competition for cyclists for three photographs hich must have been taken when an a cycling tour): First prize, 10*l.*; econd, 5*l.*; third, 3*l.* Ten prizes in all. C (Open competition for ladies nly for three photographs, any subject): First prize, 10*l.*; second, 4*l.*; hird, 2*l.* Ten prizes in all. D (Open competition for boys or girls under fteen years of age for three photographs): First prize, 10*l.*; second, 3*l.*; hird, 2*l.*; fourth, 1*l.* Twelve prizes in all. E (Open competition for beginers—those who start photography in 1898—for three photographs): First rize, 5*l.*; 2nd, 2*l.*; third, 1*l.* Ten prizes in all. F (Open competition for hree instantaneous or snap-shot photographs): First prize, 8*l.*; second, 4*l.*; hird, 2*l.*; fourth, 1*l.* Five prizes in all. C (Confined to the cities of lasgow, Edinburgh, Belfast, and Aberdeen, or within a radius of three miles f these cities, for three photographs, any subject): First prize, 10*l.*; second, .; third, 3*l.*; fourth, 1*l.* Ten prizes in all. Entry forms and full particurs can be obtained at the firm's various branches in Glasgow, London, dinburgh, Belfast, and Aberdeen.

THE USES OF CHROME GLUE, ESPECIALLY AS GLASS CEMENT.—Chrome glue i known to consist of a moderately strong gelatine solution, containing five to ten per cent. of gelatine, to which about one part of acid chromate of potassium in solution is added to every five parts of gelatine. This mixture possesses the property of becoming insoluble by water through the action of sunlight under partial reduction of the chromic acid, a property which is advantageously utilised in photography. The author coated both fractures of a glass as uniformly as possible with the freshly prepared solution, pressed them together, and fixed them in this position with a cord. The cylinder glass was exposed to the sunlight, and was found to be firmly united after a few hours. Even hot water did not dissolve the oxidised chrome glue, and the fracture was scarcely noticeable. Valuable articles of glass, which would be disfigured by a thick cement joint, can be very nicely repaired in this manner. In the production of waterproof textures chrome glue is likewise of use, at least where a certain tightness is no drawback. The fabric, after having been put in a frame, only needs to be painted one to three times with the hot chrome glue, and then to be exposed to the sunlight or daylight.—*Professor Sweizer in Textil Zeitung.*

A RÖNTGEN WOMAN.—Latest among marvellous French discoveries is "La Femme Röntgen," a woman who is described as being able to read with ease through opaque bodies. Such at least, says the *Daily Telegraph*, is the story gravely related to-day. We are told that Dr. Ferroul, of Narbonne, has found and has introduced this phenomenal lady to his colleague, Dr. Grasset, Professor of the Medical Faculty at Montpellier. "All this is quite impossible," exclaimed Dr. Grasset when he was informed of the new wonder. "Well, you will see," was the quiet reply. Then the demonstration was made. The woman succeeded in reading, and that at a certain distance, a letter the envelope of which had been covered with seals and also posted as an additional precaution; and so Dr. Grasset was converted. Some scepticism on this subject is still permissible, nevertheless; yet what a vista of queer possibilities does not this open out, even if "La Femme Röntgen" possesses only a moderate share of the extraordinary qualities thus attributed to her. She would be invaluable at a Custom House, for instance, as her fine eyes would promptly detect contraband articles, while many a document would no longer have any secrets, at least for her. There would, indeed, be no limit to the field to which her talents could be applied. Most people, however, will prefer to wait until they have a chance of beholding "Mademoiselle Rayon X" in the flesh reading out the contents of some missive which has just been indited and deposited in a good thick envelope, held at the other end of the room, which, as she is represented as being able to decipher manuscript under like conditions at a distance of 300 yards, ought to be a mere trifle for her to accomplish.

ON Monday, December 6, the failure of Mr. Charles Knight, photographer, of 108, High-street, Newport, came before the Isle of Wight Bankruptcy Court. The gross liabilities were returned at 226*l.* 16*s.*, and those expected to rank at 193*l.* 8*s.* 8*d.* The assets were, stock in trade (exclusive of that claimed by Mrs. Knight), 7*l.* 10*s*; furniture (ditto), 14*l.*; book debts, 64*l.* 16*s.* 1*d.*; making a total of 86*l.* 6*s.* 1*d.* There was thus a deficiency of 140*l.* 9*s.* 11*d.* The debtor attributed his failure to competition and depression in trade. The debtor, for whom Mr. H. R. Hooper appeared, attended for his public examination. In reply to the Official Receiver (Mr. H. C. Damant), debtor said he began business at Ryde about 1872, and removed to Newport in 1881. In 1884 he made an arrangement with his creditors, paying 20*s.* in the £ in three instalments. In 1889 he was again in difficulties, and at that time he filed his petition, his creditors being then paid 1*s.* 4*d.* in the £. He had not obtained his discharge under that bankruptcy. When he started business again in 1889, he borrowed 15*l.* from Mr Teague, of Ryde, which sum he had paid back. Asked if since that date he had ever been really solvent, debtor said yes. For a long time he paid ready money for everything. In fact, he had one or two strokes of good business. It was about ten weeks ago that he found he was getting behind. Had never made up a balance-sheet—was in too small a way for that. Had kept a day-book and ledger, and a cash-book occasionally, but the latter was never properly kept, and could not be relied upon. Had no book showing what his total takings had been. Could not exactly say what his turnover had been. His takings did not all go into the bank, as his household expenses would be taken out, and there were other ready-money payments. It was not the fact that he had been advertising for a business lately. He had advertised for premises, as he was leaving his present place that day, and he must go somewhere. He could not go to the workhouse, and he didn't intend to. The Official Receiver: I should not advise you to do that. You cannot take other premises and open a new business without funds. What do you propose to do?—Debtor: I tell you straight that I have written to a gentleman to lend me 200*l.*, but I have not had a reply. He is a millionaire. *Q.* It has been suggested by a creditor that if you are in a position to take a new business you must have some funds.—I could not take a business. I have no funds. *Q.* What should you think your takings have averaged?—Between 500*l.* and 600*l.* a year. *Q.* And what would your profits be on that?—I could not tell you off-hand. *Q.* I believe the profits in your business are large?—They are sometimes. *Q.* What would they be? 10 per cent. or 50 per cent.—half your takings?—I suppose if I actually took 500*l.* or 600*l.* a year it would keep me about square. *Q.* You mean that you would be able to pay your living and other expenses?—Yes, I should be about solvent; but with the sum I have named there must not be any bad debts. *Q.* What have been your personal expenses?—Not very much. I do smoke, but I don't drink more than about three-pennyworth a week. *Q.* Can you tell what has been taken from the business for household expenses?—No regular sum has been drawn from the business for that purpose. Whatever my wife has wanted for domestic purposes she has had. I have tried to work it out, and should think it would come to about 4*l.* a week. *Q.* Are you in a position to show how your 140*l.* deficiency has gone?—No. It has gone in eight years' trading. It is a very small sum, under 20*l.* a year. *Q.* It would grow, if you lived long enough. You say you cannot make up a deficiency account?—Not one that I could swear to. The examination was closed.

Patent News.

THE following applications for Patents were made between December 1 and December 8, 1897:—

AUTOMATIC PHOTOGRAPHIC MACHINES.—No. 28,181. "Improvements in and relating to Coin-freed Automatic Photographic Machines." P. MUSHET.

LANTERNS.—No. 28,478. "Improvements in Devices for Adjusting Lime Light and other Jets for Magic Lanterns." T. BARKLEY.

AUTOMATIC PHOTOGRAPHIC MACHINES.—No. 28,577. "Improvements in Apparatus for Showing Photographs and Moving Pictures with and without Coin-freed Appliances." W. H. DUNCAN.

DEVELOPERS.—No. 28,596. "Photographic Developers." Complete specification. J. HAUFF.

ANIMATED PHOTOGRAPHY.—No. 28,634. "Improvements in and connected with Apparatus for Producing Animated Photographs." H. E. BERRY.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
20	Bradford Photo. Society	*Snap-shots.* W. J. Gray.
20	Ealing	*Method of Improving Negatives.* A. Ernest Smith.
20	North Middlesex	*Various Enlarging Processes.* Hy. Stuart.
20	Richmond	*Developers*: (2) *Ferrous Oxalate.* The President.
20	South London	Social Evening. Under the Direction of Messrs. Jarvis and Sayer.
20	Stafford Photo. Society	Photographic Christmas Cards, with Prize Competition and Sale of Papers, &c.
21	Birmingham Photo. Society	Exhibition of Specialities in Apparatus by the Thornton-Pickard Manufacturing Company, Ltd. Mr. Scott.
21	Brixton and Clapham	*Lantern-slide Making.* S. L. Coulthurst.
21	Gospel Oak	Lecture: *Developers and Development.*
21	Hackney	*Architecture.* John H. Gear, F.R.P.S.
21	Leeds Photo. Society	*Carbon Printing.* W. T. Wilkinson.
21	Royal Photographic Society	*Photo-mechanical Printing in Connexion with the Survey of India.* Colonel Waterhouse.
22	Borough Polytechnic	Lantern Evening.
22	Kingston-on-Thames	Lantern Evening by Members of Richmond Camera Club.
22	Leeds Camera Club	Smoking Concert.
22	Leytonstone	*Architectural Photography.* F. J. Clarke.
22	Photographic Club	*The Spectroscope and its Application to Photography.* E. J. Wall.
23	London and Provincial	Open Night.

ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 14,—Ordinary Meeting, held in the theatre of the Society of Arts, the Right Hon. the Earl of Crawford, K.T. (President), in the chair.

MATTERS OF BUSINESS.

Seventeen candidates for membership were nominated, twelve candidates nominated at the last meeting were elected, and the Bolton Mutual Photographic Society and the Aintree Photographic Society were admitted to affiliation. Messrs. Bulbeck and Cembrano were elected auditors.

GIFT OF A LUMIÈRE CINEMATOGRAPH.

Mr. JULES FUERST, on behalf of Messrs. Fuerst Brothers, presented the Society with one of M. Lumière's cinematographs, and

The PRESIDENT expressed the cordial thanks of the Society to Messrs. Fuerst for their handsome gift.

COLOUR PHOTOGRAPHY.

Professor GABRIEL LIPPMANN gave a very full and most lucid description of his method of interference colour photography, and exhibited a series of examples of the results obtained thereby. The apparatus necessary, he explained, was very simple, and differed only in slight particulars from that ordinarily employed. A film of gelatino-bromide, or albumeno-iodide of silver, or any other sensitive substance, is exposed in the camera in the ordinary manner, but the sensitive film must be in contact with a metallic mirror. To secure this object, the sensitive plate is placed in a dark slide, and mercury is allowed to flow into a receptacle of which the plate forms one side; a dark slide adapted for this purpose was exhibited, and it appeared that the mercury was contained in a small reservoir at the side, from which it was forced by a pneumatic arrangement into a space at the back of the plate, so that the mercury was in contact with the film. After exposure, the mercury is withdrawn into the reservoir, and the plate is taken out, treated with pyrogallic acid, amidol, or any other suitable developer, fixed, and washed. The result is a negative which is colourless while wet, but upon drying the colours appear true and bright, provided the photographic operations, exposure and development, have been properly carried out. The colours are visible by reflection; they are completely fixed, and resist the action of light and time. Now, how is it that the colours are seen? The photographic operations are the same as in monochromatic photography, the materials are the same as in an ordinary negative, but the colours are sent back to the eye in consequence of a phenomenon of interference due to the structure which the deposit has acquired, just as colours are produced by a colourless soap bubble, or by mother-of pearl formed of colourless carbonate of lime. The use of the mercury mirror is to reflect back the incident coloured rays, and thus make the incident light vibrations stationary; these stationary vibrations fall in the interior of the sensitive film, and impress upon it their own structure; and when fixed, dried and examined by white light, the photographic deposit, though by itself colourless, has acquired the property of sending back to the eye those component parts of white light by which it has been impressed, and reproduces the colours of the original. If the mirror were not employed, the vibrations giving rise to light waves would rush through the plate with a velocity of 300,000 kilometres per second and would leave no record of their own form; with the mirror the light is reflected back on itself, the entering and issuing waves interfere, and the result of the interference is to stop the effects of propagation and to cause stationary waves which impress their form on the film; it is a mere mechanical adaptation of the form of the deposit to that of the light vibrations. In support of the theory that the colours are due to interference, Professor Lippmann said many reasons might be given amongst them there is the fact that, while the plate is wet, the colours are not visible, and that, if wetted after drying, the film swells, and the thickness of the laminæ is no longer suitable for the production of the interference phenomena. This was shown by wetting a photograph of the spectrum treating it with alcohol, and placing it in the lantern, when, as the film became gradually dry, the colours were restored. Another proof of the theory is that the colours change with the incidence; the photographs must be viewed in the direction of the regularly reflected ray, or only a colourless negative will be seen.

The lecture was illustrated by a number of very beautiful experiments, and the exhibition of results, including stained-glass windows, and flowers, landscapes, and portraits from nature, was received by a crowded audience with loud and prolonged applause.

In answer to questions,

Professor LIPPMANN said that the exposure, in the case of a portrait taken by M. Lumière, and a landscape at Barritz, was about a minute, but in Paris an exposure of two or three minutes was necessary for similar subjects. In order to exhibit the pictures to the meeting, the electric light was thrown on to the photograph, and from thence reflected through a projecting lens on to the screen. The plates were sensitised with suitable substances in the proportion of about one part of dye to 500,000 parts of emulsion. The sensitive film must be transparent and grainless, and to secure this essential condition the silver salts were dissolved in gelatinous water instead of pure water. He had not yet succeeded in printing duplicates from the original plates, but was sure that it was possible to do so. Over-exposure could be corrected to a considerable extent without falsifying the colours, but there was less latitude than in ordinary photography. An enlargement or copy could be made by projecting an original upon a sensitive plate backed with mercury, as in taking the photograph.

Mr. J. W. SWAN remarked that it was particularly interesting that this beautiful process had not been discovered by accident, but was the result of careful calculation, reminding one of the simultaneous discovery by Mr Adams and M. Le Verrier of the planet Neptune. Science knit the world together, and, in the presence of the invention which had been so magnificently demonstrated to the meeting, one felt that there was a universal brotherhood of science, and that the divisions of the sea were as nothing. He moved that the cordial thanks of the Society be given to Professor Lippmann for his most able and interesting lecture

Mr. J. SPILLER supported the motion, and

The PRESIDENT, referring to the remarks of Mr. Swan as to Le Verrier and Adams, instanced Jannsen and Lockyer, to whom, at an interval of two or three days of time, but at a distance of 4000 miles, the idea almost simultaneously occurred that it was possible to see the spectra of the prominences of the sun at any time, and not only during the period of an eclipse. He then put the vote of thanks, which was carried by acclamation, and briefly acknowledged by Professor Lippmann.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 9,—Mr. Robert Beckett in the chair.

A discussion took place with reference to the best method of blackening a negative after bleaching with mercury.

Mr. HADDON mentioned the ammonia method, preceded by very thorough washing.

Mr. E. J. WALL thought a satisfactory answer could only be given when it was known for what purpose the negative was intended, whether it was an ordinary negative, a line negative, or a screen negative. The best method was that which would give one just what he wanted, whether it was a little or much intensification. Speaking from the experience of others, he did not think the ammonia method was the easiest.

Mr. HADDON said that this was why he stipulated for perfect washing, and added that he knew a photographer who washed his plates for ten or twelve hours after bleaching with mercury when it was proposed to blacken with ammonia.

COLOUR PHOTOGRAPHY.

Mr. WALL said he had intended to talk about three-colour work, both for projection and printing, but unfortunately the Hon. Secretary had but a week before taken this topic for his own remarks. Having referred to Ives's method of photography in natural colours, which was a three-colour method pure and simple, and involved the use of three screens for the three negatives, Mr. Wall said that Dr. Joly used, instead of three separate screens, a plate on which he placed all the screens to be employed. This plate or screen was ruled in three colours—orange-red, green, and violet-blue—in very fine lines, about 200 to the inch, which lines were all in touch with one another. One of these screens was shown in the lantern, and, when its image was thrown out of focus, gave an approximately white field of illumination. In practice, this screen was placed in contact with the dry plate and exposed, the resulting black-and-white negative being built up of lines. A positive was made and placed in

contact with what is called a viewing screen, which was ruled in slightly different colours, with the result that a coloured image was formed upon the lantern sheet. A photograph of a coloured picture taken by the process was shown in this way. Attention was drawn to the peculiar effect of shifting the viewing screen upon the positive, a movement so slight as the two-hundredth of an inch instantly changing the colours of the objects in the picture, for all the world like the colours of a chameleon. By means of the blackboard the theoretical explanation of this change of colour was given. Mr. Wall had carefully read the pamphlet on the process, and found that, besides the negative screen described, the use of an "intercepter," in the shape of a yellow screen of picric acid in water or collodion, was recommended. This was placed near the lens of the camera, so as to cut down some of the ultra-violet and the blue. A Cadett Spectrum plate was recommended also in the instructions, and, with regard to this point, Mr. Wall said, in his work with these plates, using two arc lamps at about eighteen inches from the original, a lens working at *f*-7, with a reduction of about one-tenth, he had given what he thought was a fairly long exposure—one minute, but with no result. The exposure was increased to five, and again to twenty minutes, and it was only with an exposure of forty-five minutes that he got the result shown. He was then engaged in experiments with his own collodion plates, by the use of which he expected to get on better; in fact, quite recently he had got a photograph by this process with an exposure of fifteen minutes, although it was not good enough to show. Mr. Wall subsequently discussed the essentials to the successful practice of three-colour printing, and the method of producing the collotype or half-tone blocks. As regards the colour filters, he criticised the opinions set forth in a recently published text-book, to the effect that a single set of three screens was not of much use, for the reason that coloured objects were not all alike, and that it was necessary to modify the screens for different subjects, for which purpose filters of coloured glass of varying depths of tint were preferred to glass tanks. Mr. Wall had used both screens and tanks, and found it much easier to add to, and take from, the strength of colour with the latter, by dilution or adding the concentrated dye. As regards the necessity for modifying the screens to suit a particular picture, he did not agree, and showed a colour chart and a coloured print for comparison. He doubted if any one of the colours of the chart was contained pure in the print, but it was quite possible to reproduce the two things with one set of screens if they were adjusted in the spectroscope. He went at some length into the question of the sensitisers for colour photography, and detailed some of his own work in this direction. In conclusion, he touched upon the Dansac-Chassagne process of photography in natural colours, and exposed the true nature of the "selective absorption" of the dyes.

Mr. BANKS considered that a set of screens of different depths was much simpler in practice than the tank of Mr. Wall.

Some discussion ensued with reference to the Chassagne process, and the meeting terminated with a vote of thanks to Mr. Wall for his chat.

PHOTOGRAPHIC CLUB.

DECEMBER 8,—Mr. Sydney Keith in the chair.

Unfortunately both fixtures fell through, owing to Mr. Willats, who was to have shown some very old photographs, not being present, and to Mr. Welford having been unable to devote sufficient time to preparation.

Mr. STRETTON referred to the use of nitrite of potassium as a restrainer in the development of platinum prints. Of a one-grain solution he took twenty minims to the ounce of developer, which, applied to two deliberately over-exposed prints, almost obliterated the image in one case, and in the second resulted in what appeared to be a badly developed print.

The opinion was expressed that, in smaller quantities, its use might be advantageous in saving a bad print.

The CHAIRMAN showed a negative, developed after his visit to Japan, which was on a plate of American make. The plate, after exposure, was laid film downwards at the bottom of the box, with two slips of paper at each end to separate the box from the film. As soon as developed, the plate showed, where the film had been in contact with the paper, less density than did the unprotected parts, and he inquired for accounts of similar occurrences.

Some discussion arose, and it was suggested that, so far from the paper slips having spoiled the negative, they had protected the plate, and that probably some emanation from the cardboard was responsible for the darker or fogged appearance where the plate was unprotected. There was nothing so good as packing plates film to film, and tightly fixing them.

Mr. H. L. Noel-Cox showed some greatly enlarged photographs of the ruins of the late fire, taken from roofs and party walls, and selected with a view to stereoscopic slides being made of them; they were enlarged from three and a quarter square by a 1500 candle-power arc lamp, and were from halves of stereoscopic pairs.

Mr. C. WALLIS showed photographs of a model of a horse, and said doubt had been thrown on the position of the animal's legs, the model being intended to represent motion.

It was agreed that the position was most unnatural, and Mr. HAES and Mr. DOWELL discussed the point from intimate knowledge of the facts.

A selection of the Club's slides was passed through the lantern, some of which were much admired, and amongst others Mr. DOWELL showed one of which he required an explanation. In this view an image of the sun was unintentionally included, and in the middle of this an elliptical mark which puzzled him.

Considerable interest was manifested in the shape of the mark and its position on the sun's image, but beyond the "scientific" explanation which Mr. Dowell had from a friend and repeated, to the effect that it was caused by reflection of the light backwards and forwards in the lens finally striking the plate diagonally and causing the elliptical shape, no good reason was offered.

MANCHESTER PHOTOGRAPHIC SOCIETY.

DECEMBER 9.—Two new members were elected: Messrs. M. W. Thompstone (Manchester) and Charles S. Gibb (Bowdon).

Mr. SCOTT, of the Thornton-Pickard Company, gave an exhibition and demonstration of the apparatus manufactured by them. A series of lantern slides of their various cameras and other apparatus were first shown on the screen, and also of subjects which had had short exposures, varying from one-third to one-five-hundredth part of a second. The demonstrator then explained the various actions and movements of their cameras with the aid of the apparatus itself. These cameras may be used either as hand or stand cameras, and can be opened ready for use almost instantly. The many different shutters were also shown and explained, including the focal plane shutter, which is used for the extremely rapid exposure of one thousandth part of a second. Dark plate-holders and dark slides (which are practically the same thing), tripods, exposure recorders, and the new film-carriers, were also shown.

Brixton and Clapham Camera Club.—December 7.—Mr. G. BIDDELL gave a lantern lecture,

PICTURESQUE ESSEX.

The district described includes Maldon, Chelmsford, Colchester, and their surrounding villages, yachting on the Blackwater, Thames scenes taken off Gray during the great frost of 1895, &c. The views and subjects of archæological interest were described by the lecturer in his usual entertaining manner, and would come as a surprise to many who have an idea that Essex is flat and uninteresting. Certainly any one may with advantage spend a holiday in the county, which everywhere offers splendid opportunities to the photographic or architectural enthusiast.

Croydon Camera Club.—The Lantern Show held on Wednesday, the 8th inst., at the small Public Hall, was quite as successful as any of its precursors. There was a large audience, which seemed thoroughly pleased with the fare provided. The first part was devoted to members' slides, which were both numerous and generally of high quality. The claims on our space will not allow of detailed notice of all the good things. We, however, note that Councillor Noaks' *Flying Cat;* Mr. Fuller's thatched cottages; Mr. Allen Noaks' dolphin costume prize winner (Mr. A. E. Ward); Mr. Watson's refined and correct Norwich Cathedral pictures, and slide of the brethren of those "heroes who, riddled by bullets, played 'Cock o' the North' whilst the Gordons charged through the death zone;" Mr. Wilcox's *Hayes Common*, which brought out hearty plaudits; Mr. Carley's processional scenes at Epb's Fleet; Mr. Isaac's monograph of a unique Welsh concentric castle; and an exceptionally fine series of the Giant's Causeway, by Mr. J. Chadwick Taylor, met with much favour. The second part consisted of a display of animated photographs, shown by means of Lumière's cinematograph. This extended to about an hour, and was well appreciated by an audience which has now had considerable experience of this photographic development. Amongst the scenes which met with favour were *The Bull Fight*, *The Visit of President Faure to the Czar*, and *The Fire Alarm*. Much interest was also shown in a scene taken from a railway carriage in motion, the view being of the flying landscape as seen through the carriage window. The effect produced was very remarkable, and when a turnpike road, which ran nearly parallel to the line of rails, came in sight, and on it was beheld a new woman astride a cycle, trying hard to race the train, the audience became uproariously delighted. It should be stated that the above display of moving photographs was given by special arrangements with the proprietors of Nestle's Milk and Sunlight Soap, who are to be congratulated upon so successfully combining their business with other people's pleasures.

Gospel Oak Photographic Society.—December 7, the Treasurer in the chair.—Mr. McKellen gave a demonstration of the capabilities and extreme simplicity of the hand camera of which he is the inventor and patentee, and to which he has given the title Infallible. Mr. MCKELLEN said that he was the inventor of a large number of improvements in connexion with photographic apparatus, and his experiments and labours in this direction were given additional impetus from the fact that all his efforts had been towards producing apparatus which would please himself, and which was designed to fill wants which he had himself experienced. In 1884 he patented his double-pinion treble patent stand camera, which was shown at the Exhibition of the Photographic Society of Great Britain of the same year, and there gained the first medal that had ever been awarded for apparatus by that body. As showing the value of this invention, Mr. McKellen stated that, with but a slight alteration of pattern, this camera was still the standard pattern for the present day, and was copied as nearly as the patent laws would allow. His latest invention, the Infallible hand camera, which was the result of experiments extending over seven years, he now had the pleasure of submitting to the members of the Gospel Oak Photographic Society. In producing this camera, the points he had aimed at were simplicity, certainty of action, and non-liability to get out of order, and he thought he might justly claim to have attained his object. On the question of simplicity, any one who could pull a string, press a button, and turn a handle, could manipulate this camera, as these were the sum total of the movements required for making an exposure, and changing the plate. As regards certainty of action and non-liability to get out of order, he claimed that there was absolutely nothing to go wrong, as the whole of the moving portions were of metal, and the movement was entirely mechanical, gravity or other force, except that contained in the camera itself, having nothing to do with the changing. Simply turning the handle once round did this. The outward appearance of the camera was that of a leather-covered box, with a leather handle to carry it by, and the only indication of its purpose was the front lens aperture, the pressure button, and the lever or handle at the side, which gave control over the changing apparatus. This mechanism is divided into three parts, viz., the sheaths for carrying the plates, the changing mechanism proper, and the gripper. The sheaths are of the usual pattern used in magazine hand cameras, with the addition of a steel pin, which projects about one-third of an inch on the bottom of each side. The changing mechanism consists of two guide plates, one on each side of the interior of the camera. A groove runs from back to front of the plates, and at the end of each of the grooves there is a circular hollow, in which a disc,

carefully fitted, revolves, one in each hollow. These discs are mounted on a shaft, which runs in holes in the centre of the guide plates. One end of the shaft passes through the camera side, and the handle is fitted on to it. The sheaths stand packed one behind the other between the guide plates, the pins being in the grooves. As they are pressed forward by back springs, the pins of the first sheath press against the disc, whilst the top of the sheath bears against the stop rail at the top of the camera. The discs have each a notch cut in them capable of receiving the pins of the sheaths. When the handle is in its normal position, the notches are directly opposite the grooves, and the pins of the front sheath, being pressed from behind, pass into the notches, where they remain till after the plate is exposed. Immediately after exposure the handle is turned steadily forward to the right a complete turn. To do this, it must be eased off the safety pin by springing. The object of the safety pin is to prevent the handle being accidentally turned. The forward movement of the handle causes the pins which are in the notches to be carried forward and downward until the sheath has left the stop rail, when the top portion of it drops forward into the receiver. The discs still continuing their circular motion, the notches and pins arrive at the position when the pins are free to leave the notches. The whole sheath then deposits itself in the receiver. Continuing the movement of the handle until it is again on the safety pin brings the notches in the discs again in a line with the groove of the guide plates, and, the second sheath being pressed forward into them, the second plate is ready to be exposed. The operation of turning the handle to change the plate also moves the indicator, which can be seen from the outside and register the number of plates exposed. The exposed plates are prevented from shaking about after they have been deposited in the receiver by the action of the gripper. This consists of a plate of aluminium, which presses the top sheath against the back of the camera, and so holds fast the whole of the sheaths bearing exposed plates. The action of the gripper is controlled by the same handle which effects the changing of the plates. On turning the handle, the gripper is first moved away to allow the top of the plate to fall into the receiver, and, when the whole of the sheath is deposited therein, springs back into position, and holds it so tightly that it is impossible for the sheaths to be shaken, even when the camera is turned upside down. To prevent the light from passing through the lens when the front is opened for the purpose of changing the diaphragms, or what not, there is an automatic cut-off. This consists of a shutter placed behind the lens, and connected by means of a lever to the hook which fastens the front. To open the front, it is first of all necessary to release this hook, and, in doing this, the shutter or cut-off behind the lens is closed, and thus the light is prevented from entering and fogging the plates. The camera can be focussed for various distances by means of a lever underneath, and is fitted with a rapid rectilinear lens, of excellent covering power, with rotating diaphragms. The shutter may be either a Thornton-Pickard, or the Camera can be obtained fitted with McKellen's new lever safety shutter. This shutter is made entirely of metal, and is especially suitable for use in humid or hot climates. The great feature of this shutter is that the lens is not uncovered during the operation of setting, the power being moved instead of the shutter itself. The Infallible hand cameras are usually fitted with the usual pattern of reflecting finder, but that shown by Mr. McKellen is fitted with Heywood's direct vision-finder. This consists of a sight piece hinged at the back of the camera, in front of which is hinged a wire frame the exact size of the plate. On bringing the camera up to the level of the eye, and looking through the hole which is in the sight piece, everything which is seen within the limits of the frame will be included in the plate. The ingenuity displayed by Mr. McKellen in the designing of this camera was much admired by the members, and the arrangements were voted excellent. The members were invited to try the changing device for themselves, and the several who did so were much impressed with the ease and smoothness with which it was manipulated. A vote of thanks to Mr. McKellen brought the meeting to a close at ten p.m.

Hackney Photographic Society.—December 7, Mr. E. Puttock presiding.—Mr. J. H. GEAR gave a lecture on

ENLARGED NEGATIVE-MAKING,

in the course of which he said that enlarging by this means had distinct advantages over enlarging direct on bromide paper, in the respect that there was much more latitude; original negatives of a wider range of quality could be used, and one was not bound down to the use of one particular printing process. Many held the opinion that the intermediate transparency should be made by the carbon process, but the speaker gave preference unhesitatingly to the dry plate for this purpose, he being of opinion that a carbon transparency was only of advantage when a great amount of amplification was intended. By the use of the dry plate one had the power of using negatives of varying quality, hard or soft as occasion might produce, and faults in the negative could be corrected to any degree; on the other hand, for a carbon transparency, only a plucky negative was suitable. Concerning the transparency, the question arose as to whether it should be made by contact and so be of the same size as the original negative, or whether it should itself be an enlargement. As the quality of the positive transparency was so very important, and consequently it might be necessary to make several attempts in order to get a perfect result, it was advisable, for the sake of economy, to use small plates, and so the contact method should be employed. It was essential that the original negative be carefully spotted before making a transparency from it. One of the great advantages of this method of making enlargements was in the facilities given for modifying and controlling the final result. In the first place, the negative could be spotted and worked up if necessary, then the transparency could be similarly treated, and, finally, the finishing touch could be made on the enlarged negative. As before mentioned, the character of the transparency was all-important; it must be of sufficient density, but not heavy in the shadows; when finished, it should appear somewhat flat in tone, but this flatness must not be the result of over-exposure. An exposure should be given sufficient to produce all tones and required density in a short time of development. Prolonged development gave increased contrast, which was undesirable. When making the transparency, it was not necessary to use special transparency plates, a moderately slow negative plate would do. this work Mr. Gear had found the Imperial Fine Grain series very suita They had good latitude and almost complete absence of grain. It was necessary, as a rule, to back a transparency plate, but it was advisabl perform that operation on the large negative plate if extra brilliancy desired. The lecturer recommended pyro soda as a developer, and preferre to pyro ammonia. In the course of his lecture Mr. Gear gave complete det for making enlarged negatives, and concluded by demonstrating the makin transparencies by contact.

Putney Photographic Society.—December 7, Ordinary Meeting, Dr. W Sheppard in the chair.—Dr. SHEPPARD alluded in sympathetic terms to losses by death which the Society had lately sustained, the President (Ba Pollock) and Dr. Cuthbert Wyman, member of Council, having died with few hours of each other. Baron Pollock, being a public man, was well kno and there was little to add to what had already been said as to his career character. He had been President of the Society since its foundation, a though his position as such had been mainly an honorary one, yet he always shown great interest in the Society, and the members would alway mindful of many acts of kindness on his part. The death of Dr. Wyman inexpressibly sad; he was cut off in the prime of manhood, and early i useful and honourable career. In him the Society had lost one of its m prominent and popular members. Personally, Dr. Sheppard had to mo the loss of one of his dearest friends. Letters of condolence had been dressed to Lady Pollock and to Dr. Wyman, expressing the deep regret o the members of the Society. Replies from Mr. G. H. Pollock and Dr. Wym on behalf of the respective families, thanking the members for their exp sions of sympathy, had been received, and were read to the meeting. JOHN A. HODGES, F.R.P.S., Vice-President of the Society, then gave a lec and demonstration of

ALFIERI'S PRINTING-OUT PAPER.

He commenced by saying that the manipulation was exceedingly simple easy; there were facilities for double or combined printing, a variety of eff could be obtained, and the materials were inexpensive. The results, of wh several very fine specimens were exhibited, were much admired, and presen a great range of tone, from the warmest browns to practically pure bla The paper at present issued by the manufacturers had a medium rough face, very suitable for printing from enlarged negatives, and for a variet subjects. The finished prints had a matt surface, and, unlike many o matt-surface papers, showed a remarkable transparency in the shadows. paper kept very well, both before and after printing, and the results wer least as permanent as those obtained by any other silver process. Mr. Ho had had unmounted prints pinned upon a somewhat damp wall for a coupl years, and they had shown no symptoms of fading. A plucky negative, s as would give a good albumen print, was the most suitable for this proc better results from very dense and hard negatives could be obtained tha many other papers. Print deeply, and, for black or cold tones, very dee with hard negatives sun down the high lights when fully printed. O printing may be remedied by prolonged immersion in the fixing bath, but tone is then liable to alter. Wash very thoroughly before toning, so a remove all free chloride; this is necessary in order to preserve the purity o whites. The following toning baths were recommended:—*Platinum Bat* Stock solution: Chloro-platinite of potassium, 15 grains; distilled wate ounces. This keeps well in the dark. For use, take stock solution minims; nitric acid (pure), 2 minims; water, to make 2 ounces. Bath show acid reaction. For warm tones further dilute the bath with wa toning then proceeds slowly, and is under perfect control. For very w tones only very slight toning is necessary, and the prints should be rem before any decided change of colour is noticed. After the platinum to bath the prints must be thoroughly washed to get rid of all trace of acid b being passed into the fixing bath. *Gold Baths.*—Chloride of gold, 1 gr acetate of soda, 30 grains; water (preferably distilled), 10 ounces. This must be neutral. Warm tones, from brown to purple, can be readily obta For cold or black tones the following bath will be found suitable: Chlorid gold, 1 grain; phosphate of soda, 25 grains; water, 10 ounces. After gold toning baths, rinse the prints well before passing into the fixing b *Fixing Bath.*—Hyposulphite of soda, 3 ounces; water, 20 ounces. A fixing, wash thoroughly in several changes and in running water for a co of hours. Mr. Hodges finally proceeded to tone and fix several prints, fully demonstrated the simplicity claimed for the process, as well as certainty with which any desired tone may readily be obtained.

Richmond Camera Club.—The meeting on the 6th inst., at which Cembrano presided, was devoted to showing and testing members' slides. A large number of slides were shown, a good proportion of them being the w of beginners, and showing excellent promise. Amongst the exhibitors re Messrs. Neville, Etherington, Richards, Purcell, Skone-James, Davis, Gib and Hurter.

Bradford Photographic Society.—Mr. Laycock, of Keighley, gave account of a tour in Western France and the Pyrenees, illustrated by a lge number of lantern slides of his own taking. Mr. Laycock managed to en tain his audience very well indeed, and, besides explaining how various ph graphs were taken, he told how cheap and excellent was living on the ntinent. Although he apologised for some of his pictures, and regretted they were not up to the mark, this was hardly necessary, especially whe explained that his tour took place somewhere in January, naturally unphotographic season.

Darwen Photographic Association.—On December 2, Mr. F. FIELD of Blackburn, delivered a lecture on

RETOUCHING.

The lecturer exhibited a number of prints, showing the difference and provement which could be accomplished by even only slightly retouc the negative.

eeds Photographic Society.—The Annual Meeting of this Society was d in their rooms, Leeds Institute, on the 2nd inst. The first business of evening was the presentation of the annual report and balance-sheet, ich, after a little discussion, was adopted unanimously. The election of cers and Committee resulted in the following gentlemen being appointed the ensuing year:—*President:* P. Gilston, J.P.—*Vice-Presidents:* Rev. Beanland and G. Bingley.—*Committee:* Messrs. H. P. Atkinson, A. C. lby, B. A. Burrell, F.I.C., J. Hindle, G. H. Rodwell, and James Taylor. *Hon. Lanternist:* A. W. Atkinson.—*Hon. Librarian:* A. G. Thomas.—*n. Secretary and Treasurer:* Alfred Naylor. Mr. B. A. BURRELL proposed, 'hat the Society's meetings in future be advertised in the *Leeds Mercury* l *Yorkshire Post* (Thursday's meetings on the previous Tuesday, and esday's meetings on the preceding Saturday), instead of the present ex-nsive and laborious method of advice per post." The Committee have anged with Mr. W. T. Wilkinson to give a practical demonstration of *rbon Printing, Single and Double Transfer,* at their next meeting on st inst., and also a display of apparatus, in addition to Mr. Harold Baker's per, next month. It was announced that Messrs. C. Forsyth, B.Sc., and H. Gash had been elected members at the last Committee meeting.

Plymouth Photographic Society.—December 10, the President (Mr. E. H. cklewood) in the chair.—Mr. R. RUGG MONK read a paper on

PORTRAITURE,

Mr. Harold Baker, illustrated by a number of excellent slides, which con-ncingly enforced all the points. Posing, lighting, backgrounds, accessories, d development were very successfully dealt with, and some valuable sug-stions given by the author. The paper was greatly enjoyed by the members, 10 unanimously voted Mr. Baker a master of the art. This meeting was the st for the autumn session.

Sheffield Photographic Society.—December 7, the chair was occupied by r. Sparham Camp.—Mr. J. W. CHARLESWORTH then gave a demonstration 1 the use of the new developer,

ORTOL.

his developer, he pointed out, was very useful for negatives, as it did not ain the film or cause any frilling. For lantern slides, the chief benefits de-ved from its use were, that it did not reduce the silver chloride as most velopers did, gave very clear high lights, was quick in action, yet easily ntrolled, and could be used repeatedly. A large number of slides were en put through the lantern by the demonstrator, showing the various tones be got by this developer, most of which were of a warm tint, and in every ay equal to gold-toned slides.

Sunderland Photographic Association.—We held our Members' Lantern leeting on December 8 at the Café, Fawcett-street, and had a good attendance f members; 150 slides was passed through the lantern, and Mr. Wm. Bartram on the silver medal for slides taken at an outdoor meeting (views of Lumley astle, the wood, &c.). The medal was given by the President (Mr. Milburn). Ir. Wm. Parry (President of the Newcastle Photographic Association) acted s Judge; Messrs. Milburn and Pran attended to the lantern. Our next meet-g, on December 21, will be on *Lantern-slide Making*, by Mr. Hodges, kindly nt by the Royal Photographic Society.

Dundee and East of Scotland Photographic Association.—December 2, Ir. W. F. Hill (Vice-President) in the chair, the Affiliation lecture,

HAND-CAMERA WORK,

as read. The lecture was very severely criticised, both as regards matter nd composition. The slides, although professing to be diagrams, in o way carried out the dot principle as laid down and illustrated by keleton slides. Four new members were duly elected, and four nomina-ions received for membership. The prize in the landscape and seascape ompetitions were awarded to V. C. Baird.

FORTHCOMING EXHIBITIONS.

1897.

December 28–Jan. 1. Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough road, S.E.

1898.

January 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.

" 29–Feb. 26. Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.

January–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.

April 22–30 ..... National Photographic and Allied Trades Exhibition A. C. Brookes, Temple House, Temple-avenue, E.C.

" 27–May 14..... International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHIC HISTORY—A PROTEST.

To the EDITORS.

GENTLEMEN,—As an old member of the Photographic Society, I beg leave to raise my voice against the braggadocio of Mr. H. P. Robinson.

I have for long watched him "trimming" his leaky and rickety mud barge in those pitiful "Autobiographical sketches" of his; but now that he attacks our Society, I, for one, must protest, and that most emphatically. So long as he confined himself to himself and his puerile "life" I kept silence, for I knew well intelligent photographers would *not* take him at his own valuation. He was killed outright many a long year ago for an all-intelligent man, and why he was "made use of" at the Salon Mr. Davis's open letter explained.

In his new mass of self-puffery, wherein he talks of "inspiration" and his artistic "faculty," the poor man talks of the Photographic Society as follows:—

"I may as well say, now I am on the subject, that I have had a vast deal less to do with the exhibitions of the Photographic Society than has been attributed to me, for the one simple reason that I have never had a chance of doing more. During the latter part of the thirty years I was on the Council I seldom was able to get in an effective word for the improvement of the Exhibition. The time of the Council meetings was always taken up by interminable talk on other subjects, abstract or theoretical questions, and for some years on standards—most useful, no doubt, but not very conducive to the advance of pictorial photography. It was only during the last two or three years of my connexion with the Society that any rejections were allowed to be made. The greatest good that I ever did to the Society was by leaving it, and, with the aid of others, showing how much better a pictorial Exhibition could be made by a Society exclusively devoted to the subject. The Salon is an example which the Society has had the good sense to imitate in many ways."

Now, sir, this is the paragraph to which I take exception.

This man, whose ideals were, at the time of which he writes, dressed-up women of the middle class posing as peasants, silver printing, sharp focus (without which, according to him, photography was lost) wrongly lighted skies and landscapes, in fact, stupid productions only equalled by his more stupid teachings—"that photographs should be always taken when the sun shone."—H. P. Robinson was for years allowed the place of honour on the walls of the Society's Exhibitions, and thought all things were as they should be, and opposed every person or photograph in any way exceptional. It was *owing* to this Philistine and others of his kind that the Photographic Society could do nothing; that they deliberately opposed all reforms, we, as old members, knew well. They opposed Mrs. Cameron, as they afterwards opposed the "new photography," and the fossils rejected a picture that was afterwards chosen as a presentation print for one of the most advanced societies.

This man talks of his laudatory "press notices;" let him quote the *World*, which more than once held him up to scorn and derision.

He had nothing whatever to do with the reforms and improvements in modern pictorial photography—even the word "pictorial" is not his own; and as he says, for once truly, "the best thing he ever did for the Photographic Society was to leave it."

He went elsewhere and tried to imitate newer methods which had already been acknowledged in Pall Mall *before* he left it, and, *in spite* of him and his like. And he and others, when Pall Mall discovered new brains, touted to get them into their new show. The merit of Messrs. Cadby and Moss was first recognised at Pall Mall, and most of the other Salonites made their first appearance in Pall Mall.

And what has the Salon done? Gone to seed in mongrel "gum-bichromate processes," and all the silly experiments of the fumbling amateur. No, sir, Pall Mall has ever been to the fore in recognising merit and novelty of value since the "old gang" left it, and Mr. H. P. Robinson is not to be permitted to scoff at what he had neither the ability nor the knowledge to make or mend, but what he only marred. After a life spent and fortune made in producing the "usual thing," in his old age he turns upon his own vomit. Let it be written as his epitaph, "He was a good commercial photographer of the 'usual kind;' but, when he meddled with matters artistic, he was as an elephant dancing a minuet!"

AN OLD MEMBER OF THE PHOTOGRAPHIC SOCIETY.

FUZZIGRAPHY.

To the EDITORS.

GENTLEMEN,—I trust you will be good enough to give me a small portion of your space regarding the articles on "Fuzzigraphs." What

always strikes me is the egotism of most writers on things photographic; they seem to want to lay down the law (their law) to the effect that everybody should think alike as to how a landscape or a portrait should be rendered; a condition of things to my mind, utterly opposed to all canons of *Art*. Any one who is a competent authority admits that photography is an *Art*, and those, who like myself, have spent the best years of their lives in its pursuit, know and realise more and more each day what a genuine art it is, and what great possibilities it possesses. We are not all constituted alike—consequently do not think or see things eye to eye. No two painters ever painted alike, nor ever will, and I contend that the skilled photographic operator should be judged by his individuality just the same as the portrait or landscape painter. Camera, lens, plates, pyro ammonia, &c., are to be considered just as the painter considers his colours, a means whereby, used with knowledge and intelligence, artistic results are obtained. Assuming that the photographer has had the necessary art training should he choose to render a landscape according as the light and general surroundings at the time suggest to him, he is entitled to have his work judged from that standpoint. But how often does he get any credit from the great crowd of outsiders—both amateur and professional? Unless the critics can see everything—each individual blade of grass in a landscape, and every minute detail of lace, and each curling eyelash in a portrait—it is condemned at once with such remarks as, "Oh, the fellow hasn't focussed it sharp, or he must have kicked the camera during exposure." "Well, the pose and the general arrangement is very good, what a pity he didn't use a small stop."

It would be as reasonable and just as sensible to say of a painting of a rough sea or a landscape with a dull day effect. How much better either would have been if the artist had represented a fine day. Such critics, and unfortunately their name is Legion, are sadly in need of enlightenment; however, I very much doubt if one in a hundred of them could be made to understand the art side of our glorious profession; many of them get a camera, learn a few technicalities, photograph their friends, and perhaps succeed in getting a negative of some sort, upon which they at once consider themselves "artists" (save the mark!).

To return to our muttons, as the French say. With regard to fuzzigraphs, let me conclude this letter by saying that, when we photograph cathedrals and things, the work of men's hands, let us use small stops and make everything "grim;" but, when we come to portrait and landscape work, let us show our individuality, and give the soul that is in us a chance. I maintain that photography, in capable hands, is equal to almost any phase of art representation.

Far be it from me to throw cold water on anybody's efforts, but the tendency is to belaud any sort of meretricious productions done both by professionals and amateurs, against which I protest most strongly. Let all work at exhibitions be judged by properly qualified authority, and a proper and detailed criticism given on each production; then, and not till then, will the best professional work be shown at exhibitions. I do not mean that an exhibition of snap-shot and instantaneous work should receive detailed criticism, that would be absurd, as those pictures are nearly all "accidents," so to speak, clever enough in their way, and ofttimes wonderful, but not to be mentioned in the same sentence as a real good study of "flesh and blood," where *everything* has to be thought out by the operator before the exposure is made, and only after years and years of close application and study is he able to do this. In spite of all sorts of formulæ, exposure meters, patent rocking developing trays, &c., photography is *not*, and never can be made to be, "mechanical," as a good many want to make it out to be, it is an *art*, and a beautiful art; and, although thousands of people take photographs, it is only the few that succeed in producing the best results. Let every one study the *art* side of photography, and drop chopping and changing about with this and that formula for developer; stick to one and make yourself master of it.

There, I think I have taken full advantage of the Englishman's privilege, and had a good "grumble"—these dark days are conducive to that condition.—I am, yours, &c.,

YORKSHIREMAN.

NEW BASES FOR PHOTO-MECHANICAL PROCESSES.

To the EDITORS.

GENTLEMEN,—I was greatly interested in your notice of Dr. R. Ed. Liesegang's article upon pages 774-5 of the JOURNAL, having been experimenting upon somewhat the same ground, only aiming at different effects.

The results arrived at led to my obtaining, some months back, a provisional protection for a method of producing photo-mechanical surfaces, based upon the fact that gelatino-bromide, gelatino-chloride, or other silver salts, when reduced by usual means, can be made to have affinity for printing ink by treatment with certain chemicals such as copper sulphate and ammonium sulphocyanide, or the cupric salt with ammonium chloride, or other analogous salts, the subsequent procedure being similar to collotype, only that the material holding the sensitive bodies can be commercially produced the same as dry plates or photographic printing papers, as the emulsions used are identically the same, special means, of course, being used to ensure the gelatine adhering to the glass, parchment paper, aluminium, celluloid, or substance of a like nature.

Thus I cause the gelatine holding the reduced silver to become astringent, whilst Dr. Liesegang arrives at an opposite result.

My observations lead me to conclude that the reduced silver in a state of division is only held together by the gelatine and the attra of cohesion, and from the action of the cupric bath upon such a p cally deposited print a chemical is liberated by substitution w has the property of precipitating protein substances, and is of a nature to tannic acid. Thus the gelatine is caused to contract to the metallic particles, binding them more firmly together. In opposite case decomposition of the gelatine is set up by liberation weak aqueous acid or alkali, both of which cause protein substanc decompose when subjected to heat, thus causing the metallic atoms loosened, and thereby admitting of their being dissolved away, tog with the immediate gelatine by which they are bound.

I must leave further remarks; but, had I the time, I could sho reason he cannot obtain a finished print from a silver emulsion u plate of copper, as it is appertaining to a patent just successfully br through relative to printing by salts of silver and other metals fr metallic plate prepared as for photo-etching. Likewise, why the ch cally deposited silver, previous to coating the plate with the ar emulsion, did not fulfil his expectations.

HENRY SO

85, *Grove-road, Bow*.

DRY-PLATE MANUFACTURING NOTIONS.

To the EDITORS.

GENTLEMEN,—I always read with much interest your succinct re of society meetings, and was extra interested in the remarks of Everitt about the want of sufficient information concerning the n of our dry plates.

Considering how vital the point is, another annoyance I think to have the attention of THE BRITISH JOURNAL OF PHOTOGRAPHY. instance, we all get samples of dry plates sent us by the manufact after asking for such or otherwise. Well, my experience is, and it be well to know if it was that of others, I have oftener than onc samples sent me from the chief firms, and again and again they sent me plates from a different batch than that they have obtaine order by!

Quite recently I returned several gross of high-priced plates of sizes, as they were not only very much slower, but gave green f development, and which the sample submitted, of course, did not d

Well, could it be believed that this firm of dry-plate manfact replied, saying that, if I had not noticed that a different number w the boxes, I would not have known that the plates were different sample?—I am, yours, &c.,

A VETER

Edinburgh.

PROPOSED MEMORIAL TO HENRY FOX TALBOT.

To the EDITORS.

GENTLEMEN,—May I draw attention to the memorial which proposed to institute in honour of Henry Fox Talbot?

Every one will be aware of the inestimable value of Fox Tal researches; in fact, modern photography would have no existenc for the labours of the inventor of the calotype process. Yet it fact, hardly creditable to the photographic community, that no ma appreciation of his services has been made. At Bry-sur-Marne sta monument to Daguerre; Chalons can show one to Nicephore N but Lacock, in Wiltshire, the home of the Talbots, can display no s public gratitude. Surely, sir, we in England, who may justly cla take the leading place in photographic science, art, and manufac are not going to be behind our French neighbours in recognising the to whom we owe the foundation of our craft.

The memorial proposed is the restoration of the chancel of L Church, where Fox Talbot's father and many of his ancestors, a back as the sixteenth century, lie buried. It is probable that a distinctly commemorative character may be given to some de feature in the chancel, such as a window, but the whole chancel w commemorative.

The necessary plans have been prepared by the architect, Mr. H Breakspear, whose perspective drawing of the exterior was exhibi the last Exhibition of the Royal Academy. A pamphlet giving particulars, as well as an account of Fox Talbot's photographic can be obtained from his son, Mr. C. H. Talbot, Lacock A Chippenham, and subscriptions should be sent to the "Fox T Memorial Fund," Capital and Counties Bank, Chippenham.

I feel sure that you will sympathise with the idea of a mem and will allow your readers to express their views on the questio am, yours, &c.,

G. E. BRO

Swindon, Wilts.

THE GUM PROCESS AND THE CROYDON CAMERA CLUB.

To the EDITORS.

GENTLEMEN,—I must most strongly protest against your crediting Mr. Packham's lecture upon *The Gum-bichromate Process* to the Photographic Club, when, for every reason, the honour should be given to the Croydon Camera Club, as a consideration of the following will show.

The Croydon Camera Club was first to persuade Mr. Packham, who is one of its oldest members, to collect and arrange the main points of his experiments, for delivery at the Club.

As soon as this was heard of by the Royal Photographic Society Affiliation Committee, the latter promptly approached Mr. Packham, and secured a promise that he would repeat our lecture at the Photographic Club.

In accordance with this arrangement, Mr. Packham read his paper before our Club on November 24, requesting that a verbatim report should be held over until after December 1, when the paper was to be repeated at the Photographic Club (see descriptive report of Croydon Camera Club meeting in THE BRITISH JOURNAL OF PHOTOGRAPHY for December 3).

Should the error of description in your paper have arisen through an oversight on your part, nothing further need be said, except that I hope you will, with your usual courtesy, rectify it in your next issue; but, if it is a case of a cuckoo in the nest—that is to say, if the Royal Photographic Society Affiliation has deliberately sneaked the credit from one of its own brood, it is an action which the societies all over the kingdom should strongly resent.—I am, yours, &c.,

LIONEL G. KOUGH, *Hon. Secretary, Croydon Camera Club.*
122, *Birchanger-road, South Norwood, S.E., December* 11, 1897.

[Mr. Packham's paper, as printed in our last issue, was, as we can personally testify, "read before the Photographic Club," and we received a copy from the hands of Mr. Packham himself in the Club's meeting-room, on December 1. Hence, we have made no error, and have, therefore, nothing to rectify. But it appears that the paper had previously been read before the Croydon Camera Club, to which body Mr. Kough is of opinion credit is due for persuading Mr. Packham to undertake the work. That being so, we are sure that our readers will join us in congratulating the Croydon Camera Club on having been the agency through which Mr. Packham's valuable paper was first made public.—ED.]

THE NATUROGRAPH.

To the EDITORS.

GENTLEMEN,—As a boy interested in photography, I read all I get hold of, whether good for me or not. Of course, I have been reading about this, too, and I come to the conclusion that Roxby has got the huff badly, and it has quite upset his balance. If Mr. Waterlow's purpose is palpable to a child, it shows how plain its meaning is, and there's nothing to complain of in that. If Roxby's "time and ink" is of less value, what is that to anybody? for no child, big or little, young or old, tender or tough, can fathom the depths of the naturographic expression he uses in his letter. I put it to any man or child who sees your paper that the following in his letter is fiddle-de-dee: "There can be variations, not of principle, but of detail, constituting invention, and *gulfing the breach* between failure and success." Now, what is gulfing the breach? If you verbify (that's a good word for you) "gulf," it is surely to throw things apart, and Roxby does not spend his time and ink to prove that; he had better do as he tells Mr. Waterlow. Now, what he means is, "golfing the breach;" for, using a figure, the ball jumps from one place to another, which is as good a metaphor as Roxby's. It may be that his ink ran away with his time, and that he meant "breaching the gulf"—breaking it up, in fact. Perhaps it was "broaching the gulf"—piercing it, he had his eye on, but his ink took charge of his time. Or it may be that it was even "gulping the breach" that was flitting through his brain, as this suggests that he makes small bones of the breach. I've tried my best to get to the bottom of it, but it's a bad go. If the process is no clearer than this experiment between the gulf and the bridge, I do not wonder that people look askance on it. But I'm only a boy, with an eye on things, so think me simply GEORGE.

To the EDITORS.

GENTLEMEN,—I must thank you for the courtesy extended to me in the Correspondence columns of your current issue. There is certainly pertinence in the observation contained in your footnote to my letter, and of some of your suggestions I shall as far as practicable avail myself.

Coming to your main article, I will only touch upon the material points. I omitted in my last to state that we had also U.S.A. patents granted, which, in conjunction with the German and Swedish grants, settles the patent expert question. Secondly, you say that three colour heliography and lithography have not, so far, been rendered commercially practicable. This is just what we *have* accomplished, not quite, perhaps, on the lines currently accepted, but then that is not the point. Thirdly, as regards half-tone work, this is of interest only in so far that we are in a position to distance any competitor. I may say that, under certain frequently recurring conditions, we can supply work (inclusive of a handsome profit) at a price inferior to that at which others could produce their blocks. To give an exact estimate of difference between cost and selling price is not desirable, an opinion gained and confirmed by experience; but I am prepared, quality for quality, to execute work at ten per cent. under any other quotations, and that is all that clients care about.

As I feel I must not trespass inordinately on your valuable space, I will say that your other arguments, being merely a corollary to the other points, are answered by the aforegone. I have only to add that a long disquisition on colour photography and printing would have been *caviare* to the general, and would have constituted merely so much wasted effort, since I am not seeking the support of competitors, although I could have it for the asking.—I am, yours, &c., R. B. ROXBY.
18, *Featherstone-buildings, Holborn, London, W.C., December* 13, 1897.

[WE have carried our anxiety to be quite fair in our treatment of Mr. Roxby to the very great length of inserting the above letter, which is partly mere advertisement, and wholly an evasion of the points at issue. His references to the United States, German, and Swedish patents are beside the mark. The very first paragraph of his prospectus tells us that the "syndicate is formed for the purpose of acquiring and working the *British* patents" of Dr. Selle. What are the numbers of those patents? What is their probable value and degree of novelty? What is the nature of the "remarkable invention" of Dr. Selle, for which Mr. Roxby is asking the modest sum of 40,000*l.*?—EDS.]

NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

To the EDITORS.

GENTLEMEN,—In reference to the paragraph in your last issue, referring to the above Association, permit me to say that when the appointment of curator came before our Council it was decided to postpone the matter for a time, and I was asked to act *pro tem.* I shall therefore be very glad to receive and acknowledge any photographs that may be forwarded to me for our collection, either to the following address or to the Royal Photographic Society, 12, Hanover-square, previous to their being deposited at the British Museum. Only unmounted prints in platinum, carbon, or some permanent process, will be accepted, and whole-plate will be the standard size.—I am, yours, &c., GEO. SCAMELL, *Hon. Sec.*
21, *Avenue-road, Highgate, London, December* 13, 1897.

RETURNED LOAN EXHIBITS.

To the EDITORS.

GENTLEMEN,—It is with regret that I feel I must call attention to the manner in which my loan exhibit was returned from the recent Exhibition at Ashton.

I read reports on the Exhibition, and there noted that the invited exhibits were not treated with that consideration one expects. They were hung in between local members' exhibits; each worker's exhibit was not hung together, although the Exhibition was not classified, and, still worse, the reports stated that many invited pictures were exhibited without the artist's name appearing on the picture; even if the exhibitor did not affix his name on the front of the picture, the authorities should have done so.

Surely these failings are bad enough, but the case is made much worse when one finds his humble efforts, which have been invited, returned in what appeared to be an old egg box cut down, and the pictures practically tumbled into the box, dirty, and without any attempt at wrapping or packing.

I do hope mine is an isolated case, for, if such treatment is extended to invited exhibitors, we may soon expect them to refuse to lend, and in this way the careful and just Exhibition authorities will have to suffer for the careless and indifferent.

It would be interesting to know how other exhibitors have fared who had their exhibits returned direct.—I am, yours, &c.,

MEMBER OF THE R.P.S.

P.S.—I have just received my invited pictures from Leicester, and must give them credit for careful packing.

JOHANNA, the female gorilla of Barnum and Bailey's Circus, is one of the few members of her sex who resolutely declines to face the photographer's camera. Numerous attempts have been made to take her, but the moment she sees anyone approaching with a camera she immediately retires to the back of her cage and covers herself with straw and the blanket under which she usually sleeps.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

E. F. Usherwood, 5, Houndsgate, Nottingham.—*Photograph of cyclists.*

A. J. Moore, 23, Waterloo-road, Ramsey, Isle of Man.—*Photograph of stranded schooner, off the Manx coast, after the late storm.*

Joseph Wilkinson, Ingleton-road, Burton-in-Lonsdale, Yorkshire.—*Two paintings of a photographic background, with centre, in which to place a portrait for Christmas card.*

F. C. SMITHARD.—It is published by Messrs. Hazell, Watson, & Viney, 1, Creed-lane, E.C., price 1*s.*

R. B. U.—Sorry we can offer no opinion. Messrs. Walton & Co., of Muskham, Newark, would, doubtless, furnish you with an estimate.

W. C. CROFT.—We think that, if you will compare the rule given with the results printed at page 1079 of the ALMANAC, you will find that it works out quite correctly.

W. COLLMAN.—The cause of the fading in so short a time is clearly due to the use of the combined bath after all the gold had been exhausted. Why not tone and fix separately ?

ENAMELLING PRINTS.—BESSIE. The cause of the prints sticking is that the glass has been imperfectly treated with French chalk, or, maybe, the glass was not clean in the first instance.

YANKEE.—It is not on the market and has not been patented. We are not familiar with the precise nature of the compound, but we believe it was difficult to manufacture and coat successfully.

ADDRESS WANTED.—SOUTH WALIAN inquires for the address of manufacturers of "illuminated signs," such as Pears' Soap, &c., changing into three or more colours. Perhaps some reader can give the desired information.

THEATRICAL PHOTOGRAPHY.—A. L. W. Doubtless you will succeed, but we may tell you there will not be the novelty in the thing you seem to imagine. Stage scenes, with the performers, have been photographed over and over again.

GUM BICHROMATE.—T. WARD. Read Mr. Jas. Packham's paper in our last issue, and the leader on another page of the present number. These contain all the information to enable you to work the process successfully, and you require no other.

A CONSTANT READER.—Successful operators at this branch of work, we believe, use anastigmat flat-fielded lenses of large aperture, rapid plates, and at least two powerful flash lamps worked in suitable positions in the auditorium. The normal illumination of the theatre is also availed of. The work is not very difficult.

ROLLING PRESS.—T. GREY. The only thing to be done is to have the rusted plate repolished, and we think you will do better, and find it more economical, to send it to the maker to be done than attempt the work yourself. The grinding out of the deep rust, and then polishing the surface, is a very tedious task at the hands of a novice.

WOODBURYTYPE.—R. PHILLIPS asks if we can tell him of a suitable gelatine for making Woodbury reliefs, and about the price?—A very suitable gelatine for the purpose, and the one most generally used for it, is the "amber" gelatine of Nelson, Dale, & Co. The price is about 3*s.* 6*d.* a pound. The brand you have been experimenting with is not at all adapted for the work.

ENLARGING.—W. BETTS. If the picture was sharply focussed, there is little question that the No. 1 B would have yielded a sharper result. It does not follow that the best lantern objective is the best for photographic purposes, because they do not always work to focus, that is, the visual and chemical foci do not coincide. As both the lenses are of about the same focus always, we use the No. 1 B when enlarging.

ROYAL ARMS.—PROVINCIAL. You will certainly subject yourself to a heavy penalty for putting up the Royal arms over your shop front or on your circulars. The fact of your having supplied photographs to some members of the Royal family does not entitle you to use the Royal arms. To do that you must obtain the Royal warrant. Your informant is quite correct, unpleasant as the information may be to you.

REDUCING PRINTS.—B. NICHOLSON. Various methods have, from time to time, been published for reducing over-printed prints. The best is that adopted by professionals, namely, to add them to the waste and let the refiner do the reducing. Prints may be reduced, but they are never so good as properly printed ones, and, moreover, the trouble involved in reducing them is, as a rule, far greater than making fresh and good prints.

BAS-RELIEF POTOGRAPHY.—PUZZLED says: "In THE BRITISH JOURNAL OF PHOTOGRAPHY for April, 1897, I find a description of one method of obtaining a 'bas-relief' effect on photographs. Would the sale of 'bas-relief' photographs by this process be an infringement of Taber's 'bas reliefs' (patented)? As I have several orders for this kind of work, I should be glad of your valuable advice."—In reply : We do not think there would be any infringement.

FERRIC SALTS.—COLD PLATINUM says : "In the JOURNAL of October 1, page 634, there is given a formula for the preparation of platinum paper (cold bath). I prepare ferric oxalate from ammonia iron alum. Is this the same as the ammonium ferric oxalate given in the formula?" —In reply : Clearly not. Ferric oxalate is represented by the formula $Fe_2(C_2O_4)_3$, and ammonium ferric oxalate $(NH_4)_3\,Fe\,(C_2O_4)_3$.

LANTERN.—OXON. We feel sure that there is no fault in the lamp, and that the unpleasant odour proceeds either from badly trimmed wicks or the dirty state of the burners. All oil lamps will smoke and give off an unpleasant smell, unless they are kept scrupulously clean and the wicks evenly trimmed. Oil on the outside of the lamp or round the burners becomes vapourised, hence much of the smell complained of in oil lamps, whether in the lantern or elsewhere.

PHOTOGRAPHY AT THE CAPE.—PHOTO-CAPE says : "Can I, through the medium of your valuable JOURNAL, inquire if photography is worth anything at the Cape? Is there a demand for good work and operators; and, if so, how does the cash work out in comparison with the first-class work here? Trusting to see your reports or somebody's experience out there."—In reply : Perhaps some correspondent will help in the matter. From what we have heard, photography at the Cape is in a healthy state.

EMPLOYERS AND EMPLOYÉS.—S. R. W. Yours is a hard case, like many similar ones. Employers engage asssistants with a promise "for a year certain," at a reduced salary under that promise, and then discharge them with a week's notice when the dull season sets in. As you are only a weekly servant, you have no remedy, we are sorry to say. There should have been a written, instead of a verbal, agreement; then you would have had redress. We would specially call attention to this matter on the part of assistants when making engagements of that kind.

BACKGROUND.—T. DAVIES writes : "I want two or three backgrounds, chiefly for vignette portraits, but I want to cloud in some portions toward the bottom and sides. I have tried one, which I prepared in flat colour on canvas after some difficulty; but, when I tried the shading, I quite spoilt the background, unless it is reflatted. Can you give me any help?"—Why not try brown paper? it is a good colour for a light background without any preparation at all. If shading is required, it can easily be done with chalks or powder colour, applied with a large stump. Brown paper may be had in any length, and about five feet wide, at a few pence a yard.

FAULTY NEGATIVES. — CESTRIAN asks : "Could you kindly give me some explanation of the defects shown in the skies of accompanying prints? The negatives were taken with one of the latest type of anastigmats (of which I have sold several during the past season), and, strange to say, all complain of this defect occurring occasionally. Recently one of my customers journeyed to the Scilly Isles, and, on developing, found quite fifty per cent. of the negatives were spoiled from this cause. No matter what kind of shutter is used, the trouble seems just the same."—The fault is due either to unevenly coated plates or unequal development, but which we cannot judge from the prints. Certainly it is not due either to the lens or the shutter.

BREAKAGES.—NEMO inquires : "What is the rule in our profession anent breakages? There are so many of them that I really must make my assistants pay for their own breakages. Only recently one assistant upset ten shillings'-worth of gold solution 'by accident,' several large dishes have gone lately, and now to-night another dish (12*s.* 6*d.*), 'accident,' of course; but the accidents happen so often that I really can't afford to pay for every one's accidents. I have to stand my own accidents, of course; but, when you have to pay for eight other persons' accidents, it becomes a very serious matter. I have never yet made them pay, but there's a limit even to my patience."—There is no rule, so far as we are aware, but the custom is for the employer to bear the loss and reprimand the *employé*, if the accident is due to gross carelessness. Accidents are liable with every one, and you say that they happen *even* with *you*. You would certainly not be justified in stopping an assistant's dues unless the damage was wilful. If you wish to make the assistants pay for their breakages, you should have made a special agreement with them to that effect when engaging them.

REPRODUCTION.—PORTRAITS writes : "I have been asked to undertake the illustration of a work, and among other subjects are two very old portraits. I want to do my best, and want to use the best means to that end. 1. What is the best plate to use—colour-correct plate I mean? 2. I use Castle plates in my ordinary work. I have not experimented in that line, but would I succeed better if I stuck to these and dipped them? 3. If so, what would you recommend for the sensitiser (the portraits are likely to be dark in colour, and possibly yellowed with age)? I will use a fairly dark screen. 4. My light being a roof light, would I get a better result in diffused daylight? 5. What will be the best lens to use—wide, medium, or narrow? 6. The best stop, I presume, will be the largest which sharply covers the plate? 7. As the work will be done from home, I will expose a few plates beforehand on a similar subject; but, to save the first one or two, given a fairly deep screen, a fairly good light, stop so-and-so, about what exposure should I begin at?"—In reply : 1. Consult our advertisement columns; it is quite against our rule to recommend any particular maker's goods. 2. In all probability, yes, if the pictures are in colours. 3. See page 1029 of the ALMANAC for 1898. 4. The light you usually employ for copying. 5. Any lens that will evenly cover the size of negative to be taken. 6. Yes. 7. As you are going to expose two or three trial plates, you, as a practical photographer, will be better able to judge the proper exposure than we can be, who have not seen the subjects, or the conditions under which they have to be photographed. With two or three trials you will probably waste less plates than you might do with any suggestion we could offer from your data.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1964. Vol. XLIV.—DECEMBER 24, 1897.

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NOTICE OF REMOVAL.

ON JANUARY 1, 1898, THE OFFICES OF THE "BRITISH JOURNAL OF PHOTOGRAPHY" WILL BE REMOVED TO No. 24, WELLINGTON-STREET, STRAND, LONDON, W.C.

EX CATHEDRÂ.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1898 has been published. In size the volume is the largest yet issued, comprising as it does 1408 pages. The text matter extends to more than 500 pages, and we may be allowed to note that, in this respect, the ALMANAC is not approached by any other photographic publication at the price charged for the volume. The editorial article treats of *Animated Photography;* there are over a hundred contributed articles, and in the remaining sections of the work the endeavour has been made to epitomise the year's progress in practical photography. From the readers of the ALMANAC we have received a very large number of appreciatory letters, which we take this opportunity of acknowledging.

AMONG the papers of more or less photographic interest that are to be delivered at the Society of Arts after Christmas are the following: *The Projection of Luminous Objects in Space*, by Eric Bruce, M.A.; *Aeronautics*, by Captain B. Baden Powell; *The Recent History of Paper-making*, by Clayton Beadle; *Children's Sight*, by R. Brudenell Carter, F.R.C.S.; *The Production of Low Temperatures*, by Dr. Carl Linde; *The Cinematograph*, by Jules Fuerst.

* * *

LAST week, at the London Institution, Mr. Charles Harding delivered a very instructive lecture on *The Weather Office and its Work*. During the last half-century he said that weather offices had been established in nearly every civilised country, and their operations had been of great value, especially to mariners. The storm warnings were really more important than the daily forecasts, although the latter were prepared from the same data. After explaining various methods of taking observations, the lecturer observed that in England wind had been known to blow at the rate of 200 miles per minute, while during heavy storms the velocity had been 100 miles a minute for several hours together. The rules governing cyclonic disturbances enable the Office to make fairly accurate predictions, but those in connexion with the storm signals were more successful than the weather charts. Sunshine, rain, and snow were all carefully recorded, and photographs of flakes of the latter showed curious and beautiful formations. Lightning was also photographed now with ease and accuracy, and the results showed how erratic lightning frequently was, tying itself in knots, and darting first downwards and then upwards. The Americans were now making observations by means of kites, a mile, and even half a mile, above the earth.

* * *

ACCORDING to a transatlantic contemporary, Mr. Ernest Salzenberg, director of the gas works of the city of Crefeld, has invented an improvement in incandescent burners which relates to the production of incandescent gaslight based upon the discovery that, when the pressure of the gas is considerably increased upon the incandescent body, the said body emits a golden-yellow light, very agreeable to the eye, displaying objects in their natural colours. The gas is supplied to the burner at a pressure of about three and a half atmospheres, the burner to withstand this high pressure being of special construction. A single incandescent jet of the ordinary

size can emit a light of much more than 1000 candle power. The light is of such intensity that a person is enabled to read the finest print at a distance of 100 to 150 feet. The inventor claims that the cost of his incandescent light of 1500 candle power is only $4\frac{1}{2}$ cents per hour, while that of the ordinary electric light of 400 candle power is, in Germany, 14 cents per hour. In the apparatus constructed by Salzenberg an hydraulic pressure of 3·5 atmospheres, and even more, may be forced through the improved Auer burner. The invention is, however, only applicable where waterworks exist.

* * *

In the pages of our contemporary, *The Pottery Gazette*, some discussion has recently arisen on the subject of English *versus* foreign-made photographic earthenware, and we are glad to observe that a very high authority on the subject, Mr. Thomas Taylor, of Taylor, Tunnicliffe, & Co., Limited, Hanley has written some informative and convincing notes in defence of the excellence of the home-manufactured article. "Long before Messrs. Bates, Gildea, & Walker were in existence," says Mr Taylor, "their predecessors, Messrs. Thos., John, & Jos. Mayer, of the Dale Hall Pottery, made an extensive variety of photographic requisites for the then Daguerreotype and wet-collodion processes. The junior member of that firm—viz., Mr. Jos. Mayer, being an ardent student of photography, had a photographic studio and laboratory attached to his house at Burslem, which I visited myself on various occasions some forty odd years ago. The introduction of the dry plate, however, while it almost closed the demand for many of the articles used in the wet-collodion and kindred processes, created a demand for a superior class of dishes, washers, &c., in porcelain, and I venture to assert that this demand had never been met by any marketable article until the introduction of our granitine dishes, &c., some ten years ago. The articles issued by Messrs. Gildea & Walker were made of ordinary earthenware, such as the domestic articles of commerce were made of, and were totally unfit for the requirements of photography. About the time that Messrs. Gildea & Walker went out of the trade, photography became very popular, and amateurs and professionals considerably increased in number, and, as a matter of course, the demand for porcelain dishes, &c., increased also."

* * *

"It was about this time that the Germans appeared upon the scene, and flooded the market with an article which I have no hesitation in saying," continues Mr. Taylor, "was made of a material of a decidedly commoner character than the ordinary body made by the Staffordshire firm referred to above for ordinary domestic goods; and I venture to assert that scores of young amateurs have been driven to give up photography as a hobby in consequence of the numerous disappointments they met with, but could not overcome for the want of a porcelain dish of a quality suitable to the requirements and demands of photography; and I could give some interesting incidents of failures I experienced myself, previous to the date I commenced to manufacture dishes, &c., for my own use only. With respect to the quality of the granitine dish as compared with the German so-called 'porcelain dish,' it is well known in the pottery trade that vitreous bodies are much more difficult to produce in an article like a photographic dish than in common earthenware—that is, to produce them quite true and straight. The intensity of heat required to fire the vitreous body causes a tendency to warp to which the comm earthenware is not subjected in the easy fire it passes throug

* * *

"Further than this," adds Mr. Taylor, "I may explain th while the German article is made on the old-fashioned meth of sponging the bat of clay into what is known as an outs mould—viz., a mould which forms the inside of the dish, granitine dishes are made in a double mould, which forms inside and outside of the article and also the improved ri foot on the bottom at the same time; and the enormo hydraulic pressure necessary to accomplish this gives a dens to the body entirely absent in a dish made by the ordin process, so that one of our granitine dishes of even size a thickness as the German would necessarily weigh considera heavier; this, together with the difficulties of firing mentio above, may in some cases cause the granitine dish to be quite so eyeable as the German, which is made to *sell*. however, produce a dish which a photographer can *use* witho fear of any kind of photographic chemicals, and which w withstand the heat necessary for the 'hot-bath platinot process,' and which may be used for the various photograp chemicals indiscriminately after an ordinary wash out. myself am at the present time using a hypo fixing dish wh I have had in use for ten years."

* * *

A novel use of the kinematograph is reported from Germa where the instrument was recently used to secure a series pictures representing all the movements of the hull ma during the launching of a vessel. The instrument selected the purpose was the Messter-Betz biograph, said to be capa of recording four thousand impressions a minute. The G man naval officials are said to take considerable interest in experiment.

THE CORRECTION OF DISTORTION PRODUCED B TILTING THE CAMERA.

In our Almanac just published, Mr. C. Welborne Piper, in article under the above title, criticises certain statements c tained in a series of articles that appeared in these pa during last summer on the subject of the swing back and distortions it produces, and is designed to correct and thr doubt upon, if he does not flatly contradict, the accuracy of t results and deductions therein given. The writer states th he has been "investigating the subject for some time," and can only express regret, on his own behalf, that he did n carry those investigations to a further stage before publish his criticism, since he shows very clearly that he is eith very careless or is still far from having mastered the bar principles of the subject. We propose to deal with his rema *seriatim* so far as they are germane to the question of corr tion.

In his first paragraph he says that, so far as he has p gressed, he finds that "the angle of inclination of an appro mately correct copy is never less than the original angle," th is, the angle at which the camera was tilted to produce t distortion which it is sought to correct, and falls foul of c statement that an inclination of 11° to both negative and co produced an absolute correction of the distortions resulti from a tilt of $12\frac{1}{2}$°. Now, as a matter of fact, the correcti inclination might, under certain circumstances, *i.e.*, using

much shorter-focussed lens for the correcting operation than the one employed in taking the negative, very easily be less, and we took the trouble to specially explain how the angle in this particular case was smaller. Mr. W. H. Wheeler had pointed out that, by employing a lens of half the original focus when copying to equal size, so that the distance between lens and copy was the same as the distance between lens and plate, in making the negative, a reproduction correct in all its proportions would be obtained by merely inclining the copy at the same angle as the original tilt. As we had used the same lens for both purposes, this condition was not fulfilled, the distance in copying being nearly double that at which the negative was produced. On the supposition that the greater focal length would entail a corresponding increase of inclination, we argued that 25°, divided between the copy and the negative, should have been the correct inclination, on the assumption that, in copying to same size, the distance would be twice the equivalent focus of the lens employed. But, when we remembered that the original negative was a reduction to a scale of one-eighth, it became evident that we had not to deal with the equivalent focus in the calculation, but with a greater focal length, and a simple rule-of-three sum showed that, while our first supposition was correct, the actual angle observed (11°) was also practically correct.

Next, an "obvious error" is charged against us in our calculations in connexion with the dimensions of the distorted and correct diagrams. We need not trouble to go into details of the figures here; it will suffice to say that Mr. Piper arrives at the conclusion that the correct copy would be $4\frac{1}{6}$ inches in width instead of 4 inches square. We are quite ready to admit that the width *was* $4\frac{1}{6}$ inches. The process of correction we were describing was one that might be applied to any distorted photograph in order to restore the parallelism of its perpendiculars, and consisted in widening the upper portion to the same dimensions as the lower, instead of enlarging the upper and reducing the lower to the mean, or measurement of the central line, as would be necessary in copying to a certain scale. In making a lantern slide in the camera we are not concerned greatly whether it measures a five-hundredth or six-hundreth part of the size of the original, so long as it is correct in its proportions and fills a proper portion of the plate. We are not working to scale. In this instance, the upper portion being made equal to the lower, which, by the action of the tilting, has already been widened, the whole image was, of course, enlarged; but the funny part of the matter is that, though our critic could discover that there was an enlargement laterally, it does not seem to have struck him that the same conditions would operate vertically to produce a corresponding enlargement that way—that, in fact, the diagram would still be square and correct, though not the same size as the negative.

In the next paragraphs we fail to follow Mr. Piper, for he seems to have got involved in a series of difficulties that may arise under very abnormal conditions in negative-making, but which do not in the least affect the correction of distortion. He seems to have gone into a series of very elaborate analytical investigations of the distortion of different portions of the image under circumstances that seldom arise in practice; but these, so far as they affect the subject, will "boil down" into the simple statement we made in describing the effect of the swing back or of tilting, that vertical distortion varies in proportion in every part of the image, the upper portion being reduced, the lower increased in height. It may be consolatory to Mr. Piper, however, if we mention a fact that he does not appear to have discovered, though he may take it from us that it is so, namely, that, when vertical distortion or "convergence" is eliminated, whether by inclining the negative or copy, or both—it matters not the least—the *vertical* measurement of the image becomes strictly proportionate in all parts, although the total height may not be in correct relation to the width. The height may be either increased or diminished, but the error, whatever it may be, is equally divided, so that we need not trouble ourselves if the foreground at four feet from the camera is mightily magnified, while a building a hundred yards away is considerably dwarfed. Like Little Bopeep's sheep, "leave them alone and they will come home," and be all right at the finish.

But now we come to the more extraordinary admission on the part of a voluntary critic, an admission that induces us to suggest that he has not mastered the barest principles of the subject, otherwise his article was penned in a grievously careless mood. Speaking of one of the problematical phases of local distortion that he has tabulated, he says, "In No. 3, for example, it is necessary to increase the height and simultaneously reduce the width of the lower portion of the image, while both width and height of the upper portion must be increased. *The method of making such a correction is, at any rate, not very apparent*, for *how can the width of the lower portion be reduced without also further reducing the height?*" The passages we have italicised are so very definite (were it not that the context forbids the supposition, we should have thought there was some mistake) that we think it possible Mr. Piper may be surprised to hear that the "how" constitutes the very principle of the whole matter, and that the apparently difficult and "not very apparent" process is performed by the very simple operation of *inclining the copy*. If he doubts it, let us explain.

The "case" in question constitutes that portion of the lower part of the image which, by the action of tilting, has been made wider than the higher portions, and is yet sufficiently removed from the foreground to participate in the "dwarfing" that occurs in all but the lower portions. Now, that part of the copy will naturally be brought nearer to the lens, the upper portion being thrown further away in order to enlarge it. The result is, that the closer proximity to the lens *reduces the width* of the lower part in proportion to the upper, while the exchange of an inclined plane of delineation for a perpendicular one secures the *increase of height*, and in the upper portion, in a similar manner, both *width and height are increased*. After this, we scarcely think it worth while to argue the point much further.

It is not a question as to whether "absolute correction is possible" or not, as our critic suggests, though he is good enough to qualify the doubt by admitting that he is "not prepared to say positively" that it is not. It is possible, under any circumstances, we believe, in which distortion can be produced by mere tilting. We are not in the habit of publishing what we do not believe to be correct, and we have stated that we have successfully cured a case of distortion, giving every circumstantial detail of how it was done. Since reading Mr. C. Welborne Piper's criticism, we have independently gone over the same ground again, and applied other tests, in every case with perfectly accurate results, and we believe it will not be a difficult matter, though it necessarily involves a vast amount of tedious calculation and experiment, to formulate a definite system by which the principle can be applied under all and

any conditions, and this work we hope to complete as opportunity occurs. Meanwhile we may summarise the position.

Two different forms of distortion are caused by tilting the camera, or by using the swing back when not required: Horizontal distortion or convergence of the perpendicular lines and vertical distortion, or an alteration of the proportions of the image in different parts in the vertical direction. Both these, when caused by tilting the camera, are curable by the proper application of the principle of the swing back. Vertical distortion is an effect due entirely to the projection of the image of a perpendicular object on to an inclined plane of delineation, or *vice versâ*, of an inclined image upon a perpendicular plane, the first resulting in an increase, the second in a decrease of the height of the image produced. Horizontal distortion is produced by the same causes, but varies in degree with the focal distance; consequently, except under very rare conditions, the two defects cannot be simultaneously remedied without recourse to special means.

Now, in eliminating horizontal distortion, *i.e*, in restoring the parallelism of the perpendicular lines of a subject, the correct proportions are also restored to the image in a vertical direction, though the total height may not be in proper relation to the width of the picture; but, bearing in mind that this condition may be brought about either by sloping the negative or picture to be corrected, or by inclining the copy, and that these two plans operate in contrary directions, the one decreasing, the other increasing the height of the reproduction, it follows as a necessary corollary, that by manipulating both negative and copy there is a position for each, in which an absolutely accurate rendering of the original will result.

It remains, then, to establish a definite and practical rule by which, from certain easily established data, the necessary positions can be readily calculated under any given conditions. We believe that by recording at the time of exposure the angle at which the camera is tilted, and the focal length of the lens, or, in the case of close subjects, the actual camera extension, all the necessary data will be provided from which to calculate the respective angles of negative and copy with any lens, or for any degree of enlargement or reduction. And, finally, when worked out, we do not anticipate that the process will involve any more serious calculation than is required in computing, say, the exposures for enlarging with different lenses. The purely tentative method, without fixed data, may suffice for the mere restoration of parallelism, which is better than converging lines, but it leaves the question of absolute correctness of proportion entirely unsolved, though we do not think that, when the inclination is about evenly divided, there will, under any circumstances, be much to complain of.

The Pharmaceutical Society Again.—The Pharmaceutical Society have received another rebuff over their vexatious proceedings against those who may unwittingly sell anything that happens to contain any of the Scheduled poisons. Space would not permit of our alluding to the case last week; but briefly it is this: the Society sent a man down to Reading to purchase, of a dealer in garden requisites there, a tin of a certain proprietary weed-killer, and it was found to contain arsenic. This was supplied by an assistant in the absence of the principal. The Society, according to its usual custom, sued the proprietor in the County Court for its five-pound penalty, which, when it recovers it, goes into its pocket. The defence was that the weed-killer was sold by an assistant without the knowledge of his employer. The County Court Judge accepted this defence, and gave judgment for the defendant. Against th the Society appealed, and the case was argued before Justic Hawkins and Channell a fortnight back, with the result that, as t County Court Judge had found that the defendant had not giv any authority to the assistant to sell the weed-killer, it was mere an accidental sale, and the appeal must be dismissed. Not only w the appeal dismissed, but leave to further appeal was refuse County Court Judges have very little sympathy with the antiquat Poisons Act of thirty years ago—or rather with the vexatious pr ceedings of the Pharmaceutical Society—and some have free expressed themselves to that effect, both verbally and in the que tion of costs. But, when the sale is proved *bonâ fide*, the Court h no option but to give judgment for the five pounds, and sever photographic dealers have had to pay it for selling to the Society spies an ounce or so of bichloride of mercury or of cyanide of potassiu for photographic purposes. Some time ago, a well-known firm oilmen were mulct in the penalty for selling fly papers because th contained a small quantity of arsenic, thus proving that "pharm ceutical chemists" are qualified to sell fly papers and no one else i They are now attempting the same with regard to "weed-killers for our gardens. If the penalties did not go into the pocket of th Society, one naturally wonders whether there would be so man prosecutions seeing the way the Poisons Act is daily violated by i own members, as witness the evidence frequently brought out coroners' inquests, and the strong remarks sometimes made by th coroners. Would it not be better for the Society to look a litt more after the sheep in its own fold, instead of running after the five-pound penalties by trapping those who may occasionally sell little bichloride of mercury, a fly paper, or, maybe, weed killer f garden use?

The City Companies.—One more of the City Companies taking up the technical phase of the craft they are supposed t represent. All these Companies at one time did represent the craft bearing their names, and their members were actually engaged i them, but that was a long while ago. Of late years, however, som of the Companies have been praiseworthily setting aside annual sum for the furtherance of technical education in their various trade The Plumbers', Carpenters', and several others to wit. At the specia meeting of the Court of Spectacle Makers, at which the Master (th Lord Mayor) presided, a report was presented, the object of whic was to encourage all manufacturers and dealers in philosophica instruments, especially opticians and spectacle makers, to becom members of the Company. Various inducements to this effect wer recommended, one of the chief being the grant by the Company o a diploma, and part of the fees paid, when a craftsman takes up th freedom of the Company after serving an apprenticeship or passing theoretical and practical examination. It is also proposed to organiz lectures and exhibitions, and periodical meetings for social inter course, discussions, &c.

This is as it should be, and will be an excellent way of expending some of the annual income of the Company. The same would apply to many others of the City guilds, whose members are in no way connected with the crafts they are supposed to represent. Some of these, by the way, we expect are practically extinct as trades so far as the City is concerned—the Patten Makers, for example. How many of the rising generation of London, now its streets are kept so clean, have an idea of what a patten really is? Still this Company and others exist, and their incomes, though not like that of some of the others, is still good, and applicable, as it should be, to technical purposes in its own or kindred crafts.

Disfiguring Advertisements.—Photographers and artists frequently complain of the disfigurement of the country and sea-shore, by hideous advertisements of pills, soaps, ointments, and other nostrums, and it is to its credit that the District Council of Littlehampton have put some check upon it in their neighbourhood. It seems that the Council, in the early part of the year, granted a licence to let bathing machines on the beach. The licensee then

vered the machines with advertisements of the usual type. The ouncil then obtained an injunction to restrain, and the question of sts came before the Court of Appeal one day last week. That, owever, is not the point—which is, that one District Council, at ast, is determined that its beach shall not be rendered hideous by aring advertisements of quack nostrums. Will the District ouncils of other pleasure resorts follow suit? How many scenes e lost to photography owing to some abominable advertisement or her that would have to be included in the view?

The Forthcoming Eclipse.—The eclipse that will take lace on the 22nd proximo is duly prepared for by British stronomers. Owing to the plague at Poona, the first arrangements ad to be modified, but, it is anticipated, without any disadvantage ome of the observing parties are well on their way, and last week ie Marquis of Graham, Sir J. Norman Lockyer, and other members the Solar Eclipse Expedition left England for Colombo. Thence ey will proceed in a Government vessel to Viziadrug for work, hich it is hoped will be successful. No doubt it will, after the preparations that have been made, provided the clerk of the weather be an amiable mood. Several expeditions of late years have failed, ore or less, entirely through the state of the weather. It is to be oped that will not be the case next month. By the way, these clipse expeditions seem to be developing into somewhat fashionable utings for *dilettanti* astronomers; but it is to be hoped they will ot in any way influence the more serious part of the work to be ccomplished.

London Chamber of Commerce Exhibitions.—Another f the series of Exhibitions, promoted by the London Chamber of ommerce, of foreign-made goods as supplied to our colonies, has een opened. On this occasion it includes specimens of what are upplied to Ceylon, New Zealand, Egypt, West Coast of Africa, and waziland. The countries whose goods are chiefly represented are merica, Germany, Italy, France, and Austria, and they (the goods) re all of the cheapest description. So far as we have seen from hese Exhibitions, cheap photographic apparatus, such as we are nundated with here, has not yet reached the colonies, even from merica or Germany. This may possibly be accounted for by the act that the natives have not yet acquired the same taste for photography as they have for cheap guns, brass swords, hatchets, and the like. Possibly the time will come, however.

IS PHOTOGRAPHY A PLAYED-OUT PROFESSION?

In the Journal I generally read the last page first. Your Answers to Correspondents and the letters you get are always interesting and instructive. A week or two since you had some interesting letters on "Is Photography a Played-Out Profession?" but, instead of this question living for a time in your pages till you thought fit to put it to death with your usual well-timed decision, the subject departed this life suddenly, for no letters on it have appeared for three weeks. I therefore beg to send a few lines which, I hesitated to do before; but, as I see that no less than three of your correspondents really have been building, or are thinking of building, studios—one of them evidently has never worked in a studio, or he would not be bothered with "too glaring a light"—I venture to send them, as it was perhaps my request that you should get the photographer who said he was, in the first place, doing so well to tell your readers how he did it which started that subject.

I could not help smiling when I read that you spoke of me as having "a world-wide reputation," for that very Friday I had had a hard day's work, all for nothing; the rain came on, and as I was trudging home with all my apparatus (profits now do not run to the luxury of a porter) I was passed on the road by a local chimney-sweep driving along, with his brushes behind, *in his own dog cart*, and I would have given that chimney-sweep my "world-wide reputation" for a ride in his cart.

When *Punch's* old lady asked a fellow sot "if they sold good spirits there," the reply came, "Hic—look't me—hic—for four—hic—pence-ha'penny." When a photographer is asked the question at the top, he replies, "Look at me, after ten, twenty, or thirty years of it." We are all inclined to estimate our callings, whatever they may be, by our own individual success or want of it.

The "Busy Man" who wrote you the other week has evidently got on and feels happy; he puts his success down to his own exertions and the exercise of common sense, and thinks that, if all other photographers had done as he had done, they would have got on equally well, though there is not one single maxim or piece of advice to which ninety-nine out of every hundred photographers could object, nor which is neglected in their every-day practice. Some of the advice he gives is quite unnecessary; for instance, he says that the "busy" man taboos the "fuzzy" portrait, as if portraits "fuzzy" enough to cause the likeness to be lost were *ever* put into any photographer's shop window or show-case. The principal thing which the "Busy Man" insists on is work—hard work. Work undoubtedly makes people happy, but I wish I could believe it made them financially successful. I used to think that, if I worked hard enough and long enough, I should get on, so I used to work till about two o'clock every morning except Saturdays, when I knocked off at twelve p.m. I did my own operating, printing, developing, toning, mounting, book-keeping, and everything, even to sweeping out my studio and cleaning my windows at eight a.m., but at the end of ten years I was as poor when I began, and, what was more, was completely knocked up. A famous London photographer came here and told me if I went on I should soon be dead; I felt like it, but still I had an idea that, if I only worked hard enough, I should get on. On his advice I got a printer and toner, and knocked off work at six. Do you know that from that moment I seemed to get on better; then, in a few years, I got a retoucher in summer, and got on better still. I happened one day to mention this to a brother photographer, and he told me that he had found out years ago that the secret of financial success was not to work at all yourself, but to get others to work for you. He added, that you will never be able to do this, for, in the first place, you will not be happy unless you are at work, and, what is more, the population of your town is not big enough for you to expect enough sitters in a year to justify you in employing hands to do all your work.

Of course, it does not matter to one photographer whether the photographers in other towns get on or not, but it is of importance that young men who are thinking of entering the business—I say business, for it is the "high art" or "photographic artists" who call it a profession—should not be under any wrong impression, and that they should not think that, if they work hard enough, financial success is sure to follow. When I left school at the age of thirteen, I used then to dabble in photography; so my father told me that, as he could not help me at all, he thought I had better be a photographer. My objection at once was that I did not think it paid, for knowing all the photographers in the town, now a city, where we lived, I knew by the way their sons' trousers were patched, and other things, that the profits from photography were very small. All those photographers are now dead, and not one of them has made any of his sons photographers; yet the "Busy Man" and your correspondent at Carlisle make out that photographers' sons need not wear patched trousers; if they had to in the days of the *carte* mania, in these days of "amateur" and "process" competition, it seems to me that they will have to go without altogether, for now there are ten photographers where there used to be one, and rents are higher, because the public will no longer go up staircases through "green baize doors," yet your readers are told—and among your readers are thousands of amateurs hesitating to make the fatal plunge from "am" to "pro"—that if they only work hard, in a clean, well-appointed, comfortably furnished studio and work-rooms, and exercise the tact and good sense which most Englishmen are gifted with, and make children so enjoy being photographed that they "howl" when they go, and passers-by mistake the reason of their tears; that they take pains with plain sitters, as if every one did not know that it is these people who are capable of the most improvement, and who always give the biggest orders; in fact, that, if photographers everywhere understand their business, they will get on in spite of too much competition or failure of other trades, and the increasing growth of amateur work and process work.

To a young man who is thinking of devoting his energy to photography as a profession, I would say, if you have abundant capital and are lucky, you may, perhaps, do well; but, as for work overcoming everything, no such thing; it may bring you honour, but not necessarily £ *s. d.*, or even as much as a new suit of clothes every year.

"W. W. R."

PLAIN LANGUAGE ABOUT THE SPECTRUM.

Considerable excitement was caused in our quiet suburban road last week by the appearance of a huge railway trolley drawn by six Clydesdale horses. A small crowd quickly gathered, and the services of the police had to be called in to keep the same in order, and then, with much squeaking of pulleys, which wanted greasing, and creaking of chains, which were tested to their utmost breaking strain, The British Journal Photographic Almanac for 1898 was safely landed, by means of rollers and an inclined plane on two three-inch iron pillars, which had been supported on a concrete bed, specially set up to uphold the awful weight.

The midnight oil has been consumed, and the volume has been digested, all except one or two morsels, which are just a trifle too indigestible for my maw. The first bears the title of these notes, and is by Mr. Walter White. He is, sir, a stranger to me, but I rather fancy that we have had some interesting communications before from this authority on the subject of colour and photography. If I remember rightly, it was before the Croydon Camera Club, that distinguished assembly presided over by Mr. Hector Maclean, F.G.S., F.R.P.S., &c., that his statements were made.

There is one passage, sir, in Montaigne's "Essays" which is well worth careful study: "I would have every one write what he knows, and as much as he knows, but no more; and that not in this only, but in all other subjects; for such a person may have some particular knowledge and experience of the nature of such a person and such a fountain, that as to other things, knows no more than what everybody does, and yet, to keep a clutter with this little pittance of his, will undertake to write the whole body of physicks; a vice from whence great inconveniences derive their original."

I propose, sir, with your permission, to examine at some length, the statements made by Mr. White in his article, which will be found on pages 701–2 of your Almanac.

He commences by saying, "The photographer who ventures to make inquiries about three-colour work is so often advised to photograph the spectrum that he may be pardoned for believing that, by so doing, he will settle the matter once and for all. In this he is likely to be led astray. I do not wish to speak disrespectfully, or say harsh things about the spectrum. It is a good servant, but a bad master. First mortgage your home, and buy a spectroscope. The handy little direct-vision spectroscopes are ridiculous for photo-spectroscopic work."

In Dr. H. W. Vogel's work, *Die Photographie farbiger Gegenstände in den richtigen Tonverhaltnissen*, 1885, chapter ii., page 22, appear some pregnant words, of which the following is a translation: "*Practical photographers are far too prone to depreciate what is known as theory, and to ridicule its champions.*"

"The historical sketch given in the previous chapter shows sufficiently, however, that we are actually indebted to theory for the discovery of the colour-sensitive process and *the spectroscopic researches founded on the same.* When the author published his first spectroscopic experiments, there existed very little knowledge in technical circles he connexion between absorption and photographic action. Lea believed that the results which the author had obtained with the spectrum could be refuted by experiments without the spectrum, and Abney contended for a long time that not the absorbed, but the rays which passed through the film, acted on the photographic film. To-day, however, it is totally different.

"Waterhouse, Abney, Eder, Schuman, Albert, and others make daily studies with the spectrum, in order to obtain evidence of the colour-sensitiveness of substances.

"*The spectrum proves here the first test; the taking of a coloured chart the second.* The author has constructed two apparatus for photographing the spectrum. The most perfect results are given by the first (the great spectrograph), *but for most cases the smaller, which is very much cheaper, is sufficient.*"

May I add that the italics in the above and following extracts are mine in every case.

After a description of his large spectrograph, Dr. Vogel proceeds to describe his smaller instrument, and says, "This apparatus has exactly the same purpose as the previously described large spectrograph. It differs from this by its simplicity, convenient form, and portability, so that it is possible with the aid of this to make studies of the solar spectrum even when travelling or on a moving ship. The spectrum which this apparatus gives is considerably less sharp in the lines than those of the great spectrograph, and, therefore, for exact research, in which sharp definition of the lines is important, it is not suitable; *on the other hand, it is sufficiently sharp for study of the chemical action of th spectrum on plates of various kinds for observations of the variations o the chemical action of the colour spectrum, and so on.*"

Then follows a description of the camera and two figures, one a exterior and the other a section, and the spectroscope *is one of the— according to Mr. White—ridiculous little direct-vision spectroscopes* Vogel goes on to say, "With this instrument the following investiga tions: *Photographische Spectralbeobachtungen im rothen und indische Meer*, Poggendorff's Ann. B. 156, 319; *Chem. Wirkungen des Lichtes au reines und gefarbtes Bromsilber*, Ber. d. d. Chem. Gesellsch., 1875, 1635 *Neue Beobachtungen über die Lichtempfindlichkeit des Bromsilbers* ebend 1876, 667; and *Phot. Mitth.* xiii. 30. Captain Waterhouse, i Calcutta, has also used this instrument for his spectrum researches, *Phot Mitth.*, xiii. 16,197, 223; The British Journal of Photography, 187 p. 450, &c. It should be noted that the series of prisms of this apparatu strongly absorbs the violet, therefore it is less suitable than the larg instrument for researches on this end of the spectrum.

In Eder's *Handbuch der Photographie*, Band i. Heft 2, pp. 218 and 21 is a figure and description of a similar instrument used by Dr. Eder, an there is also one, made by E von Gothard, described and figured whic "Mit einem Spectralapparate à vision directe versehen ist."

Further in the *Journal of the Steel and Iron Institute*, in, I fancy 1880, is a long paper on the spectrum of iron and steel by Mr. Tucke in which the spectrum of iron was photographed even into the ultra violet by means of a direct vision spectroscope, which is now in m possession and a very fine instrument it is.

Mr. White has quoted M. Vidal. May I also do so? In his wor "Manuel pratique d'orthochromatisme" 1891, p. 91, he says, "Spectro graphe—on désigne par ce nom un appareil à l'aide duquel on pe reproduire les spectres étudiés: on a, de la sorte, mieux que l'eff produit sur la rétine, mais bien l'image elle-meme du spectre—ou tou au moins des rayon actiniques du spectre,—fixée sur une plaque sensibl *Ce mode d'expérimentation conduit a des résultats comparatifs plu complets*, surtout quand on agit avec une source de lumière uniforme and he figures and describes Vogel's direct-vision spectrograph as suitab for this work.

The next statement to which we may take exception is the necessity mortgage your home in order to buy a spectroscope, considering that good direct-vision spectroscope may be obtained for a couple of guinea or, if Mr. White will not accept this, we may obtain from Steinheil photo-spectroscopic outfit with diffraction grating for about 10*l.*, or eve an outfit with Iceland spar prism, quartz lenses, and camera for about 20 All these not only approach respectability, but are respectable instr ments and they do not approach in price the 100*l.* or so mentioned Mr. White.

Now we come to the whole crux of the matter, the *raison-d'être* of M White's article, and, curiously enough, an utterly unconscious confessi of ignorance. "Having obtained this somehow, together with yo heliostat and sunlight, or your electric or other light, proceed to ma photographs of the spectrum through colour screens. Having done th ask yourself whether the results are what you require. You will pr bably say, 'How do I know?' and may even ask me in return if th are anything like accurate. *To which I echo your question, 'How do know?'*" That's just it, Mr. White does not know what constitut accuracy!

He then quotes Captain Abney as recommending "the use of a test the pigments vermilion, emerald green, French ultramarine, and chro yellow." Now, sir, I have very carefully read through Captain Abney work, *The Action of Light in Photography*, 1897, which I presume is t work Mr. White refers to, but nowhere can I find this recommendatio Will Mr. White kindly give the page on which it can be found. Abn states on pp. 175–6, "If we can obtain a photograph on them which w render truly the luminosities of a red, a green, and a blue, that are mix colours, we shall be able very approximately to photograph any colou in nature. It is not necessary that the colour should be reflected. may be transmitted, so that, if we can photograph correctly t luminosities of the colours which are transmitted through a ruby glas a green glass, blue glass, and a white glass, we may take it that a intermediate colours will not be very incorrectly rendered, owing to t fact that each of the coloured glasses transmits a considerable quanti of the rays on each side of those colours of the spectrum which mo nearly match them." Does Mr. White suppose for one moment tha Captain Abney recommended this, except as a practical test where t photographer has not a spectroscope, or does not know what he requir when he has one?

I am glad to see that Mr. White does acknowledge that "the study

spectrum sensibility of plates is an extremely interesting one, and exhaustive inquiry may, no doubt, result in the acquisition of wledge, providing that the experimenter has a few years to spare for work." Having admitted this, why does he go on to "say harsh gs about the spectrum?" I venture to think that his next statement ounded on ignorance: "Otherwise we may safely say that a moderate es of practical experiments will probably teach more than a lifetime nnatural experiments with the spectrum." Why should experiments the spectrum be "unnatural?" is the spectrum of supernatural gin?

venture to say that less than a lifetime, less than a week, less than ay even, devoted to the determination of the spectrum sensitiveness of late or plates, will, if the experimenter knows how to read his results, ch him far more than "a moderate series of practical experiments." would be useless for me, sir, to try and teach your contributor how to d the result of spectroscopic work if I wrote, say, in German or ieiform characters, and he could not read or understand the same. e spectrum on a plate is to Mr. White simply a mass of cuneiform roglyphics which he is unable to translate; therefore he, in the words Dr. Vogel, which I have italicised, "deprecates what is known as ory;" let us hope he will not go on *deren Vertreter wohl gar zu ver-tten.*

May I give Mr. White a practical lesson, and I hope proof of the ne of spectroscopic work, which I have been lately carrying out? It s to do with three-colour work.

A firm sent to me samples of red, yellow, and blue inks which were to used for three-colour printing, with the request that I would deter-ne their spectra, and state whether they were suitable or not. It was ficient for me to see the inks to at once say they were not; it was nally unnecessary to examine them spectroscopically. However, to isfy the firm, and, may I add, to earn a little money, the spectra of light reflected from the three inks were mapped out. Will Mr. White, reading these lines, turn to the brief note you kindly inserted on the of coloured screens for photo-micrographic work—see p. 741—he ll thus save me the necessity of repeating the divisions of the colours the spectrum?

The Yellow Ink.—This was a cadmium yellow, and the spectrum owed light from $B\frac{1}{2}C$ to $D\frac{1}{2}E$.

The Red Ink.—This was, I imagine, what is known as a carmine lake; e spectrum extended from B to $C\frac{1}{2}D$.

The Blue Ink.—This was an exceptionally brilliant and pure blue, hich gave a spectrum extending from $E\frac{3}{4}F$ to H.

I put these three readings down together, starting, of course, with the d end, B to $C\frac{1}{2}D$, $B\frac{1}{2}C$ to $D\frac{1}{2}E$, $E\frac{3}{4}F$ to H.

Now, may I point out the value of these readings? It will at once be en that there is an overlapping of the yellow into the red. What does is mean? Why, the yellow was too orange. Now, sir, note the hiatus tween the yellow and blue from $D\frac{1}{2}E$ to $E\frac{3}{4}F$. What does this mean? hy, black, and the result practically dirty greens, the greens being viously formed by the superposition of the blue and yellow.

I must apologise for the inordinate length of these notes, and ask ur clemency and tax the patience of your readers for yet another week, hen I hope to continue these remarks. A. D. Pretzl.

(*To be continued.*)

EXETER CAMERA CLUB EXHIBITION.

weather which would in no way be discreditable to June—so sunshiny nd warm was it—the above Exhibition was opened "in pomp and cir-umstance" by his Worship the Mayor, who was accompanied by the Mayoress, the Sheriff, and many members of the Corporation. This lub is but a young society, having scarcely entered upon its eighth year f existence, and yet it seems to possess all the prestige of age, for the xhibition is a very strong one. It is located in one of the best halls in he city, and, as we have seen, the municipal authorities gave the ap-roval signified by their presence in state on the opening day—Thursday ast week. More than this, a well-known London expert, in the person f Mr. Andrew Pringle, was invited to act the part of Judge.

The reason for this apparent rapid advancement of a young society ay possibly be found in the circumstance—and it is one which should ommend itself to other provincial societies when the opportunity pre-ents itself—that the Camera Club has joined hands with the Exeter iterary Society, which has had a flourishing existence here as long as he oldest inhabitant can remember. "Union is strength," runs the dage, and it has not belied its reputation in this case, in giving to both odies an accession of members, besides various collateral advantages.

Under the presidency of Mr. Charles Cole, and with an able Com-nittee of hard-working gentlemen, the arrangements connected with the Exhibition, which remained upon until Saturday evening, when a concert brought the proceedings to a close, were carried out most satisfactorily. Barnfield Hall, in which it took place, is well adapted to the purpose of an exhibition, for it is well lighted by windows which are far too high to be reflected in the pictures. Electric light is at hand after sunset, and there is a convenient gallery at the end for the harmless but necessary optical lantern. This was used on the first evening for Mr. T. C. Hepworth's introductory lecture, *Photography up to Date*, and on the following night for the exhibition of the competitive lantern slides.

Mr. Pringle had placed at his disposal as Judge one gold, six silver, and five bronze medals, and it must be admitted that he had no easy or enviable task in awarding these to the right recipients. That the work was thoroughly and conscientiously done goes without saying, and none but those disappointed ones who hoped to get prizes and did not will quarrel with his decision.

The Exhibition comprised six classes, and each one was well filled with frames. Beyond these there was a small, but excellent, Scientific Section, and a very fine loan collection of characteristic pictures, sent by the R. P. S. and by Mr. Horsley Hinton. As these mostly consisted of pictures which have figured at Pall Mall and other well-known exhibitions, they are more or less familiar to our readers.

In Class A the local amateurs came out very strongly, and showed very plainly that they appreciated their surroundings, for many had sent in subjects chosen from the estuary and the river Exe, and its neighbourhood, while beautiful Exeter Cathedral formed the subject of many more. The silver medal in this Class of Members' Pictures went to a subject of this nature, No. 25, *Evening on the River Exe* (Mr. A. C. Berg); while the bronze was awarded to No. 31, a very similar study, by Mr. Edward Pocknell. This last picture, which is a little gem in its way, was taken on a half quarter-plate, a size which has lately come into vogue with various forms of pocket cameras. It will be a comfort to users of such apparatus to know that Judges do not think such pictures too insignificant for notice and reward.

Class B was also confined to Members' Pictures, and the silver medal was given, strange to say, to another picture called *Evening—River Exe*, the work of Mr. H. J. Stanbury. Still another river scene, but of quite a different type, won the bronze medal in this class, *On the Tavy*, by Mr. J. W. Huygens.

Class C was for Members' Lantern Slides, and this section of the Exhibition attracted a large number of competitors, many of whom sent in fine examples of their skill. Here the silver medal went to another view on the Exe, by Mr. F. Conway Sharpe, a very beautiful little combination of sky, water, and shipping; the bronze to Mr. F. Pearse, and a certificate to Mr. C. Cole.

Class D was the most important section of the Exhibition as regards number of frames, for it was open to all comers. The title of the picture which earned the silver medal, *Lowest Ebb*, by Mr. Alfred Jeffreys, might make one assume that this was yet another view on the much-photographed River Exe; but that was not the case, this being quite a different type of composition. The bronze medal went to Mr. C. F. Inston, for an exceedingly beautiful seascape, possessing qualities not often seen in a photograph. The title of the picture is *The Storm Lifting*. This same gentleman also won a certificate for another picture in the same class, while similar honours went to Mr. W. Dawes and Mrs. Jeanie A. Welford.

Class E consisted of an open section for lantern slides, and here, again, there was much excellence displayed. It is within our knowledge that the slides were passed through the lantern several times before the Judge finally separated the wheat from the chaff, for the chaff in this case was, some of it, very wheat-like in character. Finally he gave the silver medal to Mr. G. F. Blower, the bronze to Mr. W. A. Frazer, a certificate to Mr. W. H. Bagnell, and a special award to Mr. W. Archibald, of America, for the very finest set of lightning-flash studies which it has ever been our lot to see.

In Class F (the Champion Class) the silver medal was awarded to Mr. T L. Sym's *Want to See the Wheels go Round*, and the bronze to Mr. W. D. Welford's *Amidst the Flowers at Play*. The highest honour of all, the gold medal for the best picture in the Exhibition, was awarded to *Gas-works—Warm Work*, by Mr. Fred Marsh. This picture was, it may be remembered, hung at Pall Mall, and one of its fellows took a medal there this year. It is a wonderful picture, in which sharp contrasts of white steam and black walls are depicted with remarkable softness and delicacy.

In the Scientific Section some good work was shown: a few excellent photo-micrographs, and some X-ray pictures of fine quality. We must also make special mention of the fine series of cloud negatives and prints contributed by Mr. A. W. Clayden, the Secretary of the committee which was appointed by the British Association to study the application of photography to the elucidation of meteorological phenomena. Mr. Clayden is a resident of Exeter, and his observations—of which these pictures are some of the fruits—have been carried out on a level piece of ground close to the city. Here two special cameras are housed in sheds about 200 yards apart, and photographs of clouds are taken simultaneously in each camera, the two instruments being in electrical connexion. The results are highly creditable to the gentlemen engaged in this fascinating and useful work.

Lastly, we must say a word or two about the very complete collection o photographic apparatus contributed by Mr. Hinton Lake, of Exeter

which comprised everything that a photographer could want or wish for Among the novelties shown were two clever pieces of apparatus by local inventors. Mr. Pocknell showed a new form of dark slide, in which the shutter, when withdrawn to the fullest extent, can be unhooked, so that during exposure there is nothing to flap about or get in one's way. He claims that this is a better and safer plan than total withdrawal—after the American model. The other invention to which we would direct attention is Mr. F. Green's patent method of changing plates in a magazine of twelve or more. The plates are in pairs, each pair being held in a special form of sheath, and placed back to back. By very simple mechanism the back plate is made to perform a complete somersault and to take front place, and this is done again and again until the whole batch has been exposed to the action of the lens. It should be noted, too, that by the same movement the plate is focussed. The invention is a most ingenious one, and is likely to meet with great approval.

The Exeter Camera Club may be congratulated upon having organized a most excellent and well-managed Exhibition, and we are sorry that the attendance of the public did not come up to their anticipations. It was impossible for the committee to command success in this respect—but they most thoroughly deserved it.

PHOTO-CERAMICS IN THREE COLOURS: AN INDUSTRIAL PROCESS.

[Anthony's Bulletin.]

THE chromo-photographic process in three colours has not yet been applied to ceramics, although, as a means of obtaining, at little cost, burnt-in reproductions of coloured subjects, it has incontestable advantages.

Of course, these reproductions can be done by the superposition of three transfers—one yellow, the other red, and the third blue, printed from photo-engraved plates. The manner of operating suggests itself, being entirely similar to that employed in manufactures, and not presenting other difficulties than the exact registering of the three coloured monochromes, printed as usual on pellicles, or on a special tissue paper, each monochrome being burnt in before another one is placed over it.

Besides this process, there is one in true half-tones, *i.e.* without dots or lines, and therefore more artistic, which, we believe, has not been applied to chromo-ceramics, and which the industry can adopt with profit for certain kinds of work. We refer to the dusting process, adapted to the three-colour method. The object of this article is to describe it with sufficient detail to enable any one to utilise it.

The dusting process is based, as most of the readers of photographic publications probably know, on the hygroscopic property of certain substances—glucose, sugar, gum arabic, dextrine, &c.—which, when acted on by light in presence of an alkaline bichromate, gradually lose their hygroscopicity, whereby any matter, ground into a very fine powder, and dusted on a layer of the bichromated substances in question, previously impressed by light under a *cliché*, adheres upon it in being distributed in gradation from light to shade, according as the luminous action has more or less, or not at all, modified the hygroscopicity of the substance. The result is a perfect counter type of the *cliché*, whether negative or positive.

The following compound is quite reliable. It keeps well in the dark for a week or ten days in good condition. It is advisable, however, to employ it within forty-eight hours after its preparation. Before use it should be filtered with care:—

Glucose, liquid	50 minims.
Gum arabic (powdered the best)	25 grains.
Ammonium bichromate sat. sol.	2 drachms.*
Water	1 ounce.

The material—glass, porcelain, faïence—is flowed with this compound, drained in a vertical position for a few seconds, and, the excess of liquid accumulated at the lower edge being wiped off with a rag, the coating is rapidly dried over an alcohol lamp, or in an oven heated sufficiently to avoid crystallisation. Three or four minutes should suffice to completely desiccate it.

Small plates can be coated in this way. If they are large, it is well to equalise the coating by means of the turning table at a slow speed. Such a table, with a gas ring under the whirler, as is employed in some photogravure establishments, is quite handy, for the coating dries at the same time that it is equalised. The temperature of the plate should not exceed 110° Fahr., and the operation must be done by a yellowish light.

While coating, it sometimes happens that the bichromated compound does not flow well on the material, it divides and contracts, leaving bare spaces. One avoids it by rubbing the plate with alcohol and rotten stone or whiting, rinsing well under the tap, and, after draining, coating the plate while it is surface-wet. This done, the excess of liquid is drained and thrown away, when the plate is coated again, but in another direction. Bubbles of air and dust must be avoided with the greatest care. They give rise to stains, which it is very difficult to retouch.

* The solution can be prepared beforehand in quantity, discarding the bichromate, but replacing it by a few drops of carbolic acid, to prevent fermentation.

In the process now in question only diapositives are employed for printing, and it very often happens that the material upon which the coloured image must be printed and burnt in is not exactly plane, and therefore does not admit the use of rigid *clichés*. They should be made first on patent glass plates, then transferred on flexible and translucid pellicles. Another reason for having the diapositives on such pellicles is that they can be used as reversed *clichés* to obtain the image in its true way.

When the image is to be vignetted—portraits, for example—as it cannot be very well done in printing on bichromated films, and as the picture is an exact reproduction of the diapositive, the latter should, consequently, be vignetted when printed from the negative.

The negatives must be of medium intensity, perfect, clear, free from fog. For that purpose it is advisable to somewhat over-expose in order to obtain the faintest details in the shadows without pushing the development to force them out, and, as a consequence, to obtain the half-lights and shades with their relative values. A slow development is recommended. Intensification—we always speak of picture in true half-tones—is objectionable, since, by increasing the intensity (and therefore the contrasts), it often impairs the transparency of the half-tints, and blocks off the delicate details in the deep shadows.

The diapositives should be clear, transparent, possessing, in a word, the characteristic of the negatives. Their intensity should be about that of lantern slide—rather less, if anything. They are best made by the collodion process, or Carbutt's gelatine plates for transparences.

The negatives are made, of course, by the three-colour process, whose description we cannot give in this article with sufficient detail to be useful on account of its length. We will, however, say a word (theoretical) about the screens employed to make the analysis of the three primary colours, as it is the most important part of the process.

Examined by the spectroscope:*

The screen for the blue printing negative should absorb the coloured bands from H to $E\ \frac{3}{4}\ D$, that is, from the extreme violet to the line of the yellow. The ultra-violet rays should be suppressed.

The colour of the screen is orange. It must tend more to red than to yellow.

The screen for the red printing negative should absorb the coloured bands from A to $C\ \frac{3}{4}\ D$, that is, the red and orange.

The colour of the screen is green-yellow. It must tend more to green than to yellow.

The screen for the yellow printing negative should absorb the coloured bands from E to $D\ \frac{1}{4}\ C$, that is, the yellow and green.

The colour of the screen is blue-violet. It should tend more to blue than to violet.

The bands absorbed by the screens should be well defined. However as the colour of the same—the orange-red especially—necessitates much lengthening of the exposure time, it should not be deeper than useful to effectively restrain the action of the rays, which should not act on the photographic film.

As to the photographic plates, one may use for the three negatives those sensitive to red and yellow. It is advisable to colour-sensitise oneself the gelatino-bromide plates of ordinary sensitiveness prepared without iodide. Better and more certain results are obtained.

To avoid a cause of frequent error, each negative, and, in consequence each diapositive, should be labelled with the name of the colour to be employed when printing from it, and, for registering, marked with three transparent dots on the negative, in order to superpose the images, so that one exactly coincides on that previously printed.

Exposure.—The material, coated with the bichromated compound, exposed under the diapositive when dry, and, to prevent it from absorbing moisture during this operation, while still warm.

The exposure time necessarily depends upon the intensity of the *cliché* and the state of the weather. If the *cliché* is, as it has been advised, of medium intensity, clear in the shadows, and the sky not overcast, from three to five minutes' exposure suffices in the shade. Exposing in the sun is not advisable, and should be absolutely discarded with pellicle diapositives.

When the exposure has been short, the picture is very soft and the contrasts deficient. On the other hand, they are more or less exaggerated by over-exposure. As much as possible the exposure time should be exact, for in the three-colour process each proof should have very nearly the same character; else, when the synthesis is complete, one will obtain a colouration different from that of the original.

DEVELOPMENT.

THE development can be done by diffused daylight. It is a very simple operation. On its removal from the printing frame, the plate is placed on a large white cardboard, or, better, in a very shallow box (about two inches deep) made with this material, and the film allowed to absorb moisture for, say, two minutes; then a certain quantity of the vitrifiable colour ground into an impalpable powder—this is important—is thrown upon it by means of a pepper box. This done, one gently rubs it all over the plate for a moment, describing small circles, afterwards allowing the film to absorb more moisture before renewing the operation.

On the first application of the powder only the deep shadows and the half-shades appear. It should be so. Should the impression take hold

* A pocket direct-vision spectroscope suffices. Cost, about 12 dollars.

of the powder rapidly in the half-lights and delicate details, it would indicate under-exposure, and the image would become spoiled. In such a case it is better not to proceed, but to wash out the preparation in order to perform the operation over again. On the other hand, if the details hang back, or if, after, say, ten minutes, the development does not progress any more, or, also, if the contrasts of the picture are exaggerated, the plate has then been over-exposed, and no good result can be expected, even by breathing upon the film to impart moisture, and thus to force the development. However, local breathing by means of a tube is sometimes advantageous to bring out the details in the lights without intensifying the shadows when the exposure time has been a little too much prolonged. On the whole, it is better not to resort to any dodge for improving the impression. The result is never an exact counter type of the *cliché* which it is so important to secure in the three-colour process. There is, of course, a certain latitude, but not as great as for plain monochromes. When all the details are well developed, the plate is heated, to remove the moisture it has absorbed, and the superfluous powder dusted off carefully, in order not to remove it from the delicate half-tints where it does not adhere, as well as in the other parts of the image. Now, it remains to eliminate the bichromate not acted on by light, that is, to fix the image, as it is termed. For this purpose, one prepares the following bath :—

Fused borax, powdered	125 grains.
Alcohol	12 ounces.
Water	4 ,,

The borax is first dissolved in the water by the aid of heat, the alcohol added, and the solution filtered when cold.

The plate is immersed in a certain quantity of this solution until the yellow colour of the film has disappeared, then removed into another (new) quantity of the same, in order to secure a complete elimination of the bichromate. The plate is allowed to dry afterwards.

As to the vitrifiable colours, they should be translucid. They are found in commerce, but very often not powdered sufficiently fine for our purpose. We specially recommend the colour of Lacroix. In selecting the colour—yellow, red, carmine, blue—one should observe that they should be appropriate to the material upon which they will be burnt in. Those prepared for porcelain and faïence painting are too tender for enamel plates on account of their great fusibility, while the same would be too hard—not sufficiently fusible—to be employed on glass. Hence, one should be careful to select them according to the material to be decorated.

As we have said before, the burnt-in chromo-photographics is done either on plate and window glasses, porcelains, tiles, &c. On glass plates, and on any other material with a nearly plane surface, the work is easy, but on curved surfaces it offers some difficulties on account of the registering of the transfer proofs, which should be on pellicles often somewhat extending or contracting, and therefore not preserving their original form, which therefore prevent the three images from coinciding exactly.

On plane surfaces, the process is direct, that is, the three monochromes are successively made and burnt in on the material itself, without having recourse to transfers. Thus, one commences to print, develop, &c., the yellow proof, and, after firing, the material is again coated when cold with the bichromated compound, then exposed under the red printing diapositive, developed with the red vitrifiable colour, fired, and the synthesis completed by superposing the blue print in operating in the same way. As by firing no change occurs in the dimensions of the pictures, the registering offers no difficulty whatever, provided the registering opaque dots coincide in the three diapositives. Of course, each colour can be done by series, preparing, for instance, all the yellow proofs to fire them together, then proceeding with the red, firing, and lastly, printing the blue proofs. The reader understands that, since all the colours are transparent, the order of superposition, yellow, red, blue, can be done in any other way, specially for transparencies.

The third proofs being burnt in, the result is an encaustic facsimile of the model, with its colours very approximatively reproduced. However, sometimes it is well to complete it by a fourth monochrome in bistre, or a neutral tint made by mixing the three colours, red, yellow, blue, in certain proportion, or any other appropriate tint, from a special *cliché*, or applied by hand, when making the retouches which may be necessary, in order to give relief to the whole picture, and, by forming a general shading, to stump the crudeness of the colours.

The work on curved surfaces is done as follows :—

The yellow proof is first made on a glass plate quite clean, and, after development, covered, in avoiding striæ, with plain collodion at 1½ per cent. When the film has set, its edges are cut all round with the point of a steel scraper—not by dragging, which would cause the film to wrinkle, but by vertical strokes. This done, the plate is immersed for a few minutes in water slightly acidified with nitric or sulphuric acid (two to three per cent.), where the chromic compound is eliminated, and the collodion film becomes loosened. After rapidly rinsing, the plate is placed in a vessel filled with a five per cent. solution of dextrine, in which the film, with the image adhering to it, soon detaches itself, or may be easily detached by lifting it with the point of a brush. It now remains to transfer it on to the material, collodion side in contact with it.

When the object to be decorated is large and hollow—a plate, for example—it serves to hold the dextrine solution, and, as soon as the pellicle is detached, the liquid is slowly drained off, and the pellicle placed on the plate in the proper position. When dry it is fired, and one proceeds in the same way for superposing the two other monochromes.

If the object is small, concave or convex, it is introduced in the dextrine solution, poured in a large vessel, as described above, and placed under the pellicle, and, holding the latter in contact with the object, both are lifted out from the liquid in an inclined position, when one proceeds as above explained.

But, should the object be large and convex, then one operates as follows:—

A sheet of transparent paper is introduced in the dextrine solution, under the pellicle, and both in contact with each other, removed from the solution. The paper is now cut so as to be of the same size and shape as the proof, and the latter immediately transferred on the material while wet—the manner of doing it is obvious—then sponged by covering it with a sheet of tissue paper and blowing over the whole. This is repeated two or three times. Now, again covering the proofs with tissue paper, one gently dabs over it, as it dries before a stove, with a plug of wadding, in order that it may fit the curvature of the object.

As is seen, the transferring to very convex surfaces, often not developable, is not by any means as simple and facile as on other surfaces. For monochromes to be coloured or not, the difficulty is easily mastered by an experienced hand; but to exactly register proofs one over another, as it should be done in the chromo-ceramic process just described, is quite different. On the whole, this manner is not industrial, and the manufacturers should, in the case now in question, have recourse to printed transfers from photo-engraved plates similar to those employed for the three-colour illustrations of magazines.

P. C. Duchochois.

PHOTOGRAPHIC EXPORTS.

Compiled from the Customs Entries.

November, 1896.

Adelaide	£43	Brought forward	£3492	Brought forward	£5959
Alexandria	115	Freemantle	155	Montreal	85
Antwerp	66	Ghent	485	Otago	12
Auckland	199	Gibraltar	15	Penang	24
Bangkok	12	Hamburg	110	Perth	31
Bermuda	31	Hiogo	19	Port Elizabeth	116
Bombay	1012	Hobart	18	Rangoon	35
Boulogne	60	Hong Kong	54	Rio Janeiro	69
Brisbane	200	Jamaica	491	St. Petersburg	90
Calcutta	394	Kurrachee	15	Shanghai	69
Canterbury	30	La Tréport	10	Singapore	16
Cape Town	189	Launceston	12	Stockholm	19
Christiania	80	Madras	111	Sydney	1074
Colombo	20	Malta	37	Trinidad	45
Durban	349	Manilla	42	Yokohama	415
East London	28	Melbourne	875	Zanzibar	51
Flushing	664	Monte Video	18	Total	£8110
Carried forward	£3492	Carried forward	£5959		

November, 1897.

Adelaide	£90	Brought forward	£3373	Brought forward	£6296
Alexandria	103	Copenhagen	21	Odessa	104
Amsterdam	28	Delagoa Bay	12	Oporto	30
Auckland	195	Durban	278	Otago	31
Bangkok	570	East London	214	Perth	43
Batavia	25	Flushing	307	Port Elizabeth	210
Bombay	1053	Ghent	25	Rangoon	105
Boulogne	190	Hamburg	446	Shanghai	243
Brisbane	62	Hong Kong	159	Singapore	53
Buenos Ayres	219	Invercargill	79	Stockholm	10
Calcutta	313	Kurrachee	27	Sydney	1952
Canterbury	25	Lyttleton	60	Wellington	70
Cape Town	160	Madras	49	Yokohama	513
Christchurch	120	Malta	83	Zanzibar	47
Christiania	134	Melbourne	1137	Total	£9707
Colombo	86	Montreal	26		
Carried forward	£3373	Carried forward	£6296		

Our Editorial Table.

"Velox" Paper.

London Agents: J. J. Griffin & Sons, 22 Garrick-street, W.C.

In our Almanac just published, we call attention to Velox, a paper manufactured by the Nepera Chemical Company, of Nepera, New York, and for which Messrs. Griffin are the wholesale English agents.

This paper which yields rich velvety black images on matt, rough, or enamelled surfaces, has the valuable property of being sensitive to comparatively short exposures by daylight or artificial light, and of being safely developable in a weak actinic light. It may be conjectured, therefore, that Velox is a slow bromide paper, and we have no doubt that, from the admirable quality of the results it yields, the paper will be welcomed by very many workers who will appreciate being able to develop it in ordinary gaslight, the rapidity of development which it allows, and the latitude in exposure that it also permits. We append the essential portions of the instructions for working the paper:

Open package of paper by gaslight or very subdued light.

An average negative requires an exposure of from one to eight seconds to diffused daylight a few few feet away from northern window; electric arc light requires about same exposure. Welsbach gaslight needs several seconds more than arc light; an ordinary gas jet three or four inches' distance from negative will yield a print in one or two minutes. After exposure, develop with any of the developers given below, watching development at a few feet distance from gas or lamp light.

With any of the indicated developers development is very quick, and takes only a very few seconds. In fact, you do not need a tray, and you can put the exposed print on a glass plate or on a piece of oil cloth, and spread the developer over its surface by means of a brush or a tuft of cotton. The image will appear suddenly; as soon as it is strong enough, throw it into a hypo fixing bath, where the prints should remain five minutes or longer, then wash as usual. Fix five or ten minutes, then wash twenty minutes to one hour in running water. Longer fixing in summer time may turn the print to brown.

DEVELOPERS.

Amidol.

Water	4 ounces.
Sodium sulphite, crystals pure	200 grains.
Amidol	20 „

Ten per cent. bromide of potassium solution, about 5 drops.

Metol.

Water	10 ounces.
Metol	25 grains.
Sodium sulphite, crystals pure	½ ounce.
Sodium carbonate, desiccated*	120 grains.

Ten per cent. bromide of potassium solution, about 20 drops.

Metol-quinol.

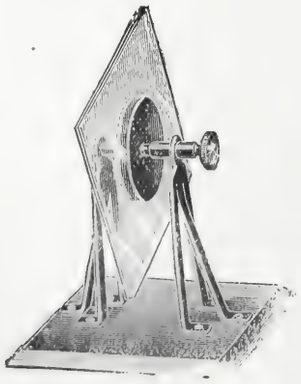
Water	10 ounces.
Metol	7 grains.
Sodium sulphite, crystals pure	½ ounce.
Hydroquinone	30 grains.
Sodium carbonate, desiccated*	300 „

Ten per cent. bromide of potassium solution, about 10 drops.

TYLAR'S NEW LANTERN-SLIDE VICE.

W. Tylar, High-street, Aston, Birmingham.

THE illustration shows a neat form of vice for holding lantern slides whilst binding. The metallic parts are made in oxidised brass. As may be seen, there is a moving milled head screw at the side which



upon being drawn out separates the two circular plates between which the lantern slide is to be placed. The vice is not only neat but effective, and is handier to use than other pieces of apparatus for the same purpose that we have seen.

* If you use crystallised carbonate of sodium, take double this quantity.

THE CYCLOPÆDIA OF PHOTOGRAPHIC BRASS WORK AND CAMERA FURNITURE.

Published by Lonsdale Bros., 22, Goswell-road.

A THIRD edition of this little work has been issued. Besides being a price-list and guide to Messrs. Lonsdale's many excellent productions, it is calculated to be of use to both professional and amateur photographers, inasmuch as it contains many illustrations and prices of the component parts of cameras, tripods, lanterns, hand cameras, tools and appliances, &c. Numerous practical hints and receipts for the cleaning, lacquering, &c., of the metallic parts of photographic apparatus are included, so that there is not an owner of a camera to whom this cyclopædia could fail to be of great service. It is sent to applicants at a charge of fourpence per copy.

News and Notes.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION. — The prize camera for current month has been awarded to Mr. H. Colebrook, Station-road, Sidcup, Kent, for his negative, *Second Sight.*

INDELIBLE INK WITHOUT SILVER NITRATE.—Grind 1¾ grammes of aniline black well with 60 drops of strong hydrochloric acid, and 42 to 43 grammes of alcohol. The liquid thus obtained is diluted with a hot solution of 2½ grammes of gum arabic in 170 grammes of water.

DARLINGTON'S HANDBOOKS GOLD-MEDAL COMPETITION.—The gold medal for 1897, offered by the proprietors of Darlington's Series of *Tourist Handbooks*, for the best photograph taken during the current year, has been awarded to Mr. Alfred Taylor, Sefton Park, Liverpool, and the second prize to Mr. David Richard Davis, Llangollen.

MR. THOMAS R. DALLMEYER writes us as follows: "Will you allow me to correct a curious omission in my note in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1898, page 690? In it I say "Divide the *focal length* in inches by the intensity of the stop used and multiply by 100." This should, of course, read, the *square of the focal length*, and the example given should be as follows: $6 \times 6 \div 6 \times 100 = 600$ inches."

MR. THOMAS VASSELL, an English artist residing in St. Louis, claims to have discovered a method of modelling clay by automatic process. The model stands before Vassell's apparatus just as for a photograph, and the result is an exact model in the clay. "My new apparatus I call a cinepantograph," says Mr. Vassell, "for the reason that it is based upon the principle of a pantograph, but is electromotive, and, instead of the pencil which traces the picture to be reproduced by the pantograph, the cinepantograph is furnished with plaster and a delicately pivoted tracer, which moves with electric speed and mathematical accuracy over the features of the model to be reproduced. As it moves, the tool at the opposite side of the pantograph attachment moves in sympathy."

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.—The Third Annual Exhibition of this Society, which is to be held at the Borough Polytechnic Institute, 103, Borough-road, S.E., on Tuesday to Saturday, December 28–January 1, will, in every respect, undoubtedly eclipse all previous displays. The invitation class has been particularly well supported, and many prominent workers will be found amongst the exhibitors. Included in the display of apparatus and accessories will be the popular photo-chromoscope, and three of these will be going at the same time. Lantern entertainments will also be an important feature each evening. Quite apart from the Exhibition proper, and in another room, will be given three separate displays of animated photographs every evening, and Röntgen's X rays will also be at work during the greater part of the time. As the Exhibition is being held in connexion with the Sixth Christmas *Conversazione* of the Borough Polytechnic Institute, there will be numerous other attractions throughout the building. The admission to the Institute will be by programme, twopence, which will also admit to the photographic exhibition. Open from 6 to 10.30 p.m.

PHOTOGRAPHING HER HUSBAND'S SPIRIT.—A curious case is now engaging the attention of the French Law Courts, in an action in which it is sought to set aside the will of Madame Rivail, better known as Countess Allan Kardec, the founder of spiritualism, by which she left the whole of her fortune, amounting to 12,000*l.*, to M. Leymarie in trust, for the furtherance of the cause. The testator, who died at the ripe age of eighty-eight, was, for thirty years before her death, completely in the hands of Leymarie. He first obtained an influence over her by materialising the spirit of her husband long since deceased, and completed his control, by arranging a special visit of the deceased's husband's spirit to a photographer's establishment. The photograph was duly taken of the materialised spirit, and submitted to the widow, who, without the slightest hesitation, pronounced it to be genuine. The "cause" afterwards profited considerably by her liberality, whereupon certain of her relatives set to work, with the result that the photographer and the materialiser of the spirit were awarded a sentence of one year's imprisonment, and ordered to pay a fine of 500 francs for fraud. This revelation, however, did not shake the faith of Madame Rivail, and, when she died, she left all her property for the "furtherance of the cause." The relatives, relying on a case decided in Bordeaux in 1893, are now endeavouring to upset the will.

AINTREE PHOTOGRAPHIC SOCIETY.—An exhibition of photographs, paintings and home industries was opened last week in the large hall of the Aintree Institute, Longmoor-lane. There was a numerous fashionable attendance, and the galleries, as well as the floor of the hall, were utilised for showing to advantage the artistic beauties of photographs, oil paintings, and delicate

od-carving. The Society is in its fourth year, and has shown a continued i steady growth, the membership at the present moment being 39, associate. total 109, as against 26 at its formation, or an increase during the past ht months of twenty-five per cent. The efforts of the secretaries, Messrs. alker and Travis, for the present Exhibition have met with every success, otographic work has been sent in from all parts of Great Britain and eign countries are represented by work from New York, Hawaii, dia, and parts of the Continent, while the home industrial work has me forward very freely, thus proving that the Society's efforts are preciated in the district, and also in the photographic world generally. ie Lord Mayor (Alderman J. Houlding) presided, and was accompanied the Mayoress (Mrs. Thos. Knowles). The Lord Mayor, on rising to clare the Exhibition open, said he could assure them of his sympathy d co-operation in the object of the Society, which was to foster that ve of art among their fellow-citizens of Liverpool. Although the Society is a small one at its initiation, it had now assumed such proportions at he doubted if there was one in the whole country that could be com- ired to it. He admired the works of art exhibited, and said it was a noble ea of the members of such a Society to combine together for mutual struction in connexion with the culture of art. The success of the Exhibition mainly due to the efforts of Messrs. E. Bennett, C. H. Adkins, R. Walker, . Travis, and a number of other gentlemen who take a deep interest in photo- aphy. The Exhibition included photographs, crystoleums, painted plaques, nbossed photo frame work, carved tables, brass repoussé fire screens, art edlework, &c. The council of the Society thanked Messrs. E. Bennett, '. H. Lloyd, F. Wheatly, W. Foulks, J. Bushell, for having presented silver edals for competitive work. The exhibits numbered over 900, which is con- derably in advance of the number of entries last year.

"The Magic Mirror."—At Toynbee Hall, recently, Professor Silvanus hompson delighted a crowded audience with a discourse on "Old Japan," ith special reference to "The Magic Mirror." He commenced by observing iat he only dealt in honest magic, and had nothing to say to them on the ıbject of divination glasses, but there were such things as magic mirrors, and ıey came from Japan. Prior to 1867, Japan was a closed country so far as uropeans were concerned, but it had a wonderful civilisation of its own, and was a deplorable thing that much which was admirable in Old Japan was eing destroyed by free intercourse with Western nations. In Old Japan ırrors played an important part, not only in the household life, but in the hinto religion. They were made of polished metal, and on the back were laborate designs, representing in the cases of rich owners the family crest. hese mirrors were handed down as heirlooms, and were regarded with eelings akin to veneration. They were held, in the Shinto religion,) be symbolical of many things, and some of the most popular Japanese tories and plays were connected with such mirrors. The "first mirror ver made" was still an object of veneration in a celebrated Japanese emple, and people went on pilgrimage to see it. This mirror vas alleged to have been made by the gods for the purpose of ttracting the goddess of day out of a cave to which she had retired in a huff. Every Japanese woman, however poor, had a mirror amongst her trousseau, nd, while in old Japan the men made votive offerings to temples of their words, the women did the same with their mirrors. Professor Thompson roceeded to explain that the "magic" in connexion with the mirrors was hat they reflected from a perfectly smooth surface the whole of the delicate racery on the back, and he demonstrated this in a very striking manner. He ent on to explain that the possession of these mirrors by certain persons in he middle ages got them into trouble, as they were regarded as sorcerers, but he mirrors were very rare. The explanation of the mystery was that, in the rocess of manufacture, the work at the back, although invisible in the olished front, "came through" when a strong light was reflected from the atter. The Japanese artificers were quite ignorant of any "magic" in the natter, and only a small proportion of the mirrors they turned out possessed he properties referred to. In conclusion, the lecturer showed how the same ffect could be produced by engraving the front of a mirror and then polishing t so that the lines became obliterated so far as the eye could detect.

A special treat was provided at Plymouth on Friday evening, December 17, when, in response to invitations sent out by Mr. E. H. Micklewood, the highly esteemed President of the Plymouth Photographic Society, to the members of this Society, the Devenport Camera Club, and other friends, a large company assembled to witness an exhibition of some American lantern slides of rare interest and exquisite quality which had at great trouble been collected by Mr. C. R. Rowe, formerly of Devonport, now of Leamington Spa, and well known in connexion with *Photography*. Mr. Rowe explained that, for the sake of Auld Lang Syne, he had had a great desire to bring before photographers in the west examples of the productions of world-renowned workers. He had now done so, and sincerely hoped that, after witnessing these works, his friends in Plymouth would be stimulated to go and do likewise. A series of lightning and shipping studies, by Mr. Archibald, some of the former being magnificently grand, and the latter of great pictorial merit, at once showed what could be done in this way. These were followed by flower studies and night pictures by Mr. Frazer. The blooms selected were orchids, mostly white, and marguerites, and, being photographed against an intensely black background, stood out with stereoscopic effect, the centres of the marguerites seeming to have their natural yellow. It was explained that the background for these flowers was one of black felt, to which the blooms were fastened with black cotton, when they were desired in any particular position. The night subjects, taken in different parts of New York after rain or a fall of snow, were a very effective series of nine pictures divided in three colours, viz., brown, blue, and blue and brown combined. The latter struck the company as being the most suitable, especially for the snow. Afterwards several pictures taken by Mr. Harold Baker and Mr. Baynton for the National Survey Record Society were shown on the screen, the slides, especially those of Fountain's Abbey, Ely, and other cathedrals, being very fine. Mr. Rowe said he felt sure similar work could be done by photographers in the west, and that there was plenty of material for suitable subjects. In conclusion he submitted three examples of slides made by the Novitas process. After a brilliant series of studies of children in fancy costumes by Mr. Graystone Bird, of Bath, from the Royal Photographic Society's recent Exhibition, the meeting closed, when Mr. Rowe was applauded again and again, and on the motion of Mr. J. Davy Turney, seconded by Mr. Johnston, was accorded a hearty vote of thanks. The services of Mr. E. Micklewood, who had put the slides through the Plymouth Photographic Society's oxyhydrogen lantern, was also acknowledged.

Patent News.

The following applications for Patents were made between December 6 and December 11, 1897:—

Ruled Screens.—No. 28,831. "Improvements in Screens or Gratings for Photographic and Photo-mechanical Work." W. Freeth.

Photographic "Device."—No. 28,889. "A New or Improved Photographic Device or Appliance." T. F. S. Pickford.

Colour Photography.—No. 28,920. "Improvements in the Production of Coloured Photographs and Apparatus for that Purpose." J. W. Bennetto.

Hand Cameras.—No. 28,998. "Improvements in Magazine or Hand Photographic Cameras." T. Miller.

Stereoscopic Colour Camera.—No. 29,353. "A Single or Stereoscopic Colour Camera." E. T. Butler.

Animated Photography.—No. 29,363. "Means or Apparatus for Producing and Exhibiting Animated or Changing Pictures on Advertising and like Appliances Carried on the Person." W. Friese-Greene.

Animated Photography.—No. 29,364. "Means or Apparatus for Producing and Exhibiting Animated or Changing Pictures on Vehicles, Steamboats, and the like, for Advertising and other purposes." W. Friese-Greene.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
28-Jan. 1.	Borough Polytechnic	Third Annual Exhibition.
28	Hackney	*Negative-making.* John H. Gear, F.R.P.S.
28	Isle of Thanet	*Further Wanderings with the Camera.* G. F. Blower.
29	Coventry and Midland	*A Cruise in the East Mediterranean.* Rev. J. T. Jones.
29	Croydon Camera Club	*Developers and Development.* S. H. Wratten.
29	Kingston-on-Thames	*Some Practical Photographic Dodges.* Cecil M. Hepworth.
29	Leeds Camera Club	Members' Lantern Night.
29	Leytonstone	Ladies' Lantern Evening: *A Trip to the Norfolk Broads by the G.E.R.*
30	Darwen	*Lantern-slide Making.* S. L. Coulthurst.
30	London and Provincial	Discussion on Exhibition Management.
31	Croydon Microscopical	Photographic Chat.

ROYAL PHOTOGRAPHIC SOCIETY.

December 21,—Photo-mechanical Meeting, Mr. J. D. Geddes in the chair.

Metallic Photo-printing.

Mr. J. Spiller exhibited several specimens of what he described as a new and very beautiful process known as Metallic Photo-printing, produced by a syndicate bearing that name, and comprising prints in gold, silver, or bronze powder of remarkable brilliancy and delicate gradation of half-tones, covered with a coating of hard, bright varnish, and so thoroughly protected from the air that they were believed to be permanent. Each picture was a transfer produced by separate exposure, and, therefore, a true photograph, mounted upon a panel of wood or a sheet of aluminium, a chromated film with honey and dextrine being used, strengthened with plain collodion. After exposure to light, the partly-hardened surface, in suitable hygroscopic condition, was dusted over with the finest metallic powder, after which the chromate and chemicals were washed away together with all the metallic particles which escaped attachment, the result being a picture in all the beautiful gradations manifested in the examples. Apart from scientific novelty, it was claimed that the process was one of artistic excellence at every stage, and the use of a special varnish was an important feature about it. The prints exhibited—in pure gold, silver, and copper—varied in size from cabinet to 12×10, and were subsequently presented to the Society by Mr. F. Ahrlé, the manager of the Syndicate.

Mr. Ahrlé said the results were obtained more by development than by printing, as by judicious dusting-on of the powder by means of a soft brush delicate details could be rendered or obtrusive portions could be softened down. The process was originally invented by a Mr. Fowler, and full details could be learned by a perusal of the Patent No. 14,077 of 1897.

Colonel J. Waterhouse said that some two or three years ago, at an exhibition at Calcutta, something very similar was exhibited by a Japanese artist, and he and some of his assistants had succeeded in producing some few examples.

Colour Photography—Dr. Joly's Process.

Mr. W. Gamble showed two lantern slides in colours, made by Dr. Joly's

process, and also a specimen of the viewing screen placed in contact with the transparencies for the purpose of rendering the colours.

PHOTO-MECHANICAL PRINTING IN CONNEXION WITH THE SURVEY OF INDIA.

The CHAIRMAN, in introducing Colonel J. Waterhouse, I.S.C., referred to the gratitude that was due to him for having so generously for many years given to the world the results of his researches in photo-mechanical printing.

Colonel WATERHOUSE then read a paper entitled *Photo-mechanical Printing in Connexion with the Survey of India*, describing in great detail the extent to which photo-mechanical methods are used for reproducing maps and drawings, the processes employed, and the special difficulties encountered in working them in a tropical climate. When he first joined the Photographic Office at Calcutta in 1866, it was located in a few rooms on the first floor of the Mathematical Instrument Department. There was a small glass house on a terrace for one camera, and a second camera was worked downstairs in a shady corner in the open air, and the few maps reproduced by photography were mostly done by silver printing. His own dark room was for many years a little wooden box, about 5 feet by 3 feet, and from 1875 to 1889 it was only a portable double-roofed canvas house about 6 feet by 8 feet. The present buildings of the Photographic and Lithographic Offices form a rectangular two-storied block, with a frontage of about 200 feet, built round an inner quadrangle about 74 feet by 80 feet; the principal glass house is a room about 31 feet by 44 feet, internal measurement, in which five cameras can be worked side by side, two large ones for plates 32 inches by 24 inches, being reserved entirely for the reproduction of the maps of the Cadastral Surveys, while the three smaller ones suffice for the miscellaneous ordinary work in black and white. During the years 1890–91 to 1894–95 the average number of subjects in hand per year varied from 6000 to over 8000; the number of negatives and photo-transfer prints was from 5000 to 6500; the zinc plates printed off by hand or machine numbered about 6000, and of stones 600, with 800,000 to over 1,000,000 pulls; other statistics were also given. The negatives for photo-zincography are all taken by the wet-collodion process, the collodion being prepared in the office; the plates are developed with iron, fixed in hypo, intensified with bromide of copper and silver, and finally coated with gelatine, to which a little balsam of tolu is sometimes added, this being found to be an effective protection to the negatives, which, as a rule, are only printed from once and then cleaned. The photo-transfer prints are usually made on thin bank-post paper, prepared by brushing it over with a solution of bichromate of potash and gelatine, and the Calcutta climate is so damp at all times of the year that the paper must be used freshly prepared, and heat is always necessary for quick drying. It was found very difficult to work the platinotype process, and it has not been much used; the new cold-bath papers work well, but the paper must be fresh and kept dry with the greatest care. Besides photo-zincography, only one other photo-mechanical process is in regular use—the photo-etching method of heliogravure, or the Talbot-Klic process, with which considerable success has been attained.

All the details of the several methods of printing were discussed in the course of Colonel Waterhouse's exhaustive paper, and a number of specimens typical of each were exhibited.

A brief conversation ensued, and in acknowledging a cordial vote of thanks the lecturer said that the credit for the introduction of photo-mechanical printing was very largely due to Mr. Swan, for without carbon printing nothing could have been done.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 16,—Mr. W. D. Welford in the chair.

The HON. SECRETARY announced that, at a committee meeting held earlier in the evening, Mr. W. D. Welford had notified his inability to continue in his office as a member of the same. The Secretary expressed the indebtedness of the Association for Mr. Welford's past help, and hoped that his absence would be only for a short time. It became the duty of the meeting to fill the vacancy caused by this resignation, and the names of nominees were called for in accordance therewith.

Mr. ROBERT BECKETT had much pleasure in formally proposing Mr. J. S. Teape, who had always been ready to afford what help he could, as a successor to Mr. Welford, and expressed the regret he had felt on the occasion of the annual election at seeing his name amongst the unelected.

Mr. E. H. BAYSTON seconded the proposition, and, no other names being put forward, it was put to the meeting, and declared carried.

The Hon. Secretary showed a large photograph, taken on the railway between Kurseong and Calcutta, depicting the destructive effect of the recent earthquake in that district.

Mr. Lewis Medland showed a series of slides illustrating a visit to the Zoo, numbering in all some 150 slides. They were by the collodio-bromide process, and were all from hand-camera shots.

The Chairman contributed a number of cycling episodes and well-known racing men, the work of Messrs. Negretti & Zambra. His own work was represented by a series of six slides, entitled *Posting a Letter*.

Mr. H. C. Rapson showed a slide from the negative recently brought before the members on account of the peculiar halation marks it bore. He also threw upon the screen a number of Continental views.

PHOTOGRAPHIC CLUB.

DECEMBER 15,—Mr. George Hana in the chair.

Mr. HAROLD BAKER, who kindly journeyed up from Birmingham specially for the purpose, read his Affiliation paper on

PORTRAITURE.

The preliminary part of his remarks was devoted to helping the beginner in his first efforts, giving useful hints on the selection of suitable background and lighting. The first slide showed the result of identical exposure to t same sitter with three differently tinted backgrounds. It was difficult believe that such different effects could be secured by such means; but t difference was due to contrast alone, as the face in all three was actually t same. The important part played by the depth of tint of the backgrou was touched upon, and slides in illustration shown upon the scre Allowance had also to be made for the exaggeration of the light and shade the photograph when arranging the lighting of the sitter, which in fact sho appear flat in the subject if softness and harmony of result be requir Reflectors for modifying the lighting should be used with care, and resu with and without reflectors were shown. Mr. Baker recommends the use the swing back for bringing into focus parts other than the eyes, which w safe points upon which to focus. Of some importance was the height of t camera, and it was better to look down upon the sitter, as a rule, this pl serving to give a better appearance to the face; but, of course, if the came were raised too much a top-heavy effect would follow. Mr. Baker favour spontaneous arrangement in posing, providing the effect was graceful, whi did not always follow. The art of posing should conceal its art. Portraitu in ordinary rooms was discussed, and examples of portraits taken with t sitter facing the light, which was a risky experiment, were shown a criticised. It was probable that lenses of the rapid rectilinear type wou yield as good results as specially made portrait lenses, the light being goo and, although the exposure should be as short as possible, where it could given a longer exposure would result in a more lifelike picture. The plat which should be quick, should not be those used for landscape work, unl a modification of the constitution of the developer be made, as the negati should be thin and soft. The newer developers were more suitable than t antiquated pyro and ammonia. The quality and characteristics of the portr negative were gone into at length, and in conclusion the photographer w advised to be content with nothing, but to try and try again.

Mr. W. D. WELFORD took exception to the term "antiquated pyro," a did not think that pyro was considered either by professionals or amateurs antiquated in any sense of the word. The newer developers referred to in t paper had the tendency to clear shadows, which was not the fault of py Certainly for portraiture pyro was not antiquated yet.

Mr. THOMAS FALL said his experience as a professional was in agreeme with Mr. Baker's, that pyro was antiquated, especially for a man who had t living to get. A pyro negative was enough to try the patience of the mo sweet-tempered man, and he had finally decided to give it up; but, at t same time, he did not tie himself to any particular developer, the choi depending on the sitter, the day, the kind of work, and the nature of t printing process to be employed.

Mr. A. MACKIE referred to the use of the rapid rectilinear lens for portr work. His own experience was that one of the greatest faults of amateu lay in the use of the same focussed lens for portraiture as they would on t same size of plate for landscape, and it could not be too well known that o of the most disagreeable features in many portraits was caused by the use o lens of too short a focus for the plate upon which it was to be employe The use of the front combination of a portrait lens was very little know Used with full aperture, it would give a portrait in which, though not abs lutely sharp, the focus was so evenly diffused that nobody would say it w out of focus.

Mr. HAROLD BAKER did not notice that the newer developers gave clea shadows than pyro gave, it was a question depending upon the exposure a upon the amount of restrainer in the developer. The difficulty with bro negatives was in estimating their density. If, as sometimes happened, o was obliged to force development, the colour varied, and it became a nuisan with many different tints to tell how they would print. Moreover, t retouchers at once complained that they could not match the colour of t brown negatives with the same ease. The newer developers gave a quic printing negative, and undoubtedly allowed a shorter exposure. With t developer he was using, the preparation of which he could not divulge, if a one adopting it asked for his advice, he should say, Reduce the exposure o half in the event of having been using pyro, and this was an enormous ga He found a 12×10 rapid rectilinear gave a very good whole-plate portra He much preferred a lens of long focus for portraiture, and here was t advantage of using the front combination of a *carte* lens, which wou cover a 12×10 plate perfectly with a delicate diffusion of focus, which w very pleasant for large work.

Mr. W. COLES, speaking of the pyro negative, said that, if the negative we made too dense, there was a reserve of colour which could be discharg which was not the case with the metol, hydroquinone, and such developers.

Mr. BAKER found his developer more under control than pyro, chiefly in t amount of water he could add to it.

The CHAIRMAN had returned to pyro again, and found, with a soft negati that he got a richer tone on albumen prints than with amidol, metol, hydroquinone. He questioned now whether the former quickened the exp sure at all; he had thought so at first, but had altered his opinion. He h pleasure in moving a vote of thanks to Mr. Baker, which was carri unanimously.

MANCHESTER PHOTOGRAPHIC SOCIETY.

LANTERN SECTION.

AT the third meeting of the above on December 15, Mr. H. V. LAWES gave lecture, illustrated by lantern slides, describing

A JOURNEY TO AUSTRALIA AND NEW ZEALAND,

which he made in the early part of the year. As far as photographic apparat was concerned, the lecturer took nothing more than a quarter-plate ha camera, and, judging from the results shown, he has been very successf Leaving London, the lecturer travelled *viâ* Plymouth to Gibraltar, snappi off several good views of the rock from the vessel, and passing on throu Naples, where pictures would have been obtained if the weather had be favourable, he arrived at Port Said. Continuing down the Suez Canal, t

ecturer took pictures of passing vessels, which were exhibited. Passing on to lbany (calling on the way at Colombo), Adelaide, Melbourne (with its grand arbour), and Sydney, the lecturer illustrated his remarks with views of these laces and of the Australian coast. Brisbane was the next place visited and s beauties shown, then back to Sydney and across to New Zealand, where uckland was the first calling place. After seeing a few of the principal uildings and streets, Gisborne was visited. Gisborne is situated in Poverty ay, so called by Captain Cook on his arrival there. From there to Napier nd on to Wellington (the capital), thence to Lyttleton, in the south island, r Christchurch, finally calling at Dunedin, from which place the lecturer eturned home. Amongst the slides shown were a series of cloud studies, hich were much admired by the audience, and from which it could be seen iat Mr. Lawes, who is an ardent lantern-slide worker, had taken great pains ith them, as indeed with all his slides, so as to obtain the best result.

Mr. TOMLINSON said he was sure the audience were pleased with Mr. Lawes' nteresting lecture, in reply to which Mr. LAWES said he hoped that those resent might some day have the pleasure of going over the same ground as e had, and he thanked them for their attention to his remarks.

Mr. J. Whittaker was the lanternist.

Croydon Camera Club.—The subject of the evening on Wednesday, the 5th, was

PHOTOGRAPHIC DODGES,

lantern lecture by T. C. Hepworth, which, in the absence of the author, as read by the HON. SECRETARY (Mr. L. G. Kough). The paper consisted of lementary examples of photo-faking, with illustrations in the shape of antern slides, and also some useful dodges for employment in using the hand amera for time exposures. A short discussion ensued, in which Messrs. ICHARDSON and SMITH joined. Subsequently, Mr. S. H. WRATTEN gave an xtempore lecturette upon the Lippmann process of producing colour photo-raphs, and illustrated the subject by diagrams. On the motion of the RESIDENT, seconded by Mr. Councillor J. NOAKES, Mr. F. E. Ives was nanimously elected an honorary life member, in consideration of his distin-uished photographic services rendered to the Club. Messrs. Brice, Stone, nd Struthers were elected ordinary members.

Hackney Photographic Society.—December 14, the President in the hair.—Mr. J. H. GEAR continued his series of lectures with the subject of

BROMIDE ENLARGING.

oncerning the two methods of illumination, daylight and artificial light, he aid that each had its peculiar advantages. Daylight was useful because it id not of necessity involve the use of expensive apparatus; it was especially uitable when strong negatives were used, and on account of its evenness of llumination was very useful for negatives which had been worked upon. The alue of artificial light lay chiefly in the fact that it was more constant than aylight, and could be used when the latter was not available, as at night-ime. A very convenient artificial illuminant was the incandescent gas. The ecturer then dealt fully with the procedure necessary for both daylight and rtificial, and explained the laws of conjugate foci, &c. Concerning the nega-ive, he said that the character of this was of great importance. It must be lean, free from fog, and have a ratio of gradation which would come well ithin that of the bromide paper. Enlargements were often made from hand-amera negatives, which, on account of their often being rather under-exposed, ere sometimes hard and unfitted for enlargement. In such cases the proper ourse was to reproduce the negative, and in doing so to reduce the scale of ensities by suitable treatment. For purposes of enlarging, the opacity hould be in inverse proportion to the amount of amplification, *i.e.*, the reater the amount of enlargement, the thinner the required negative. In ealing with the bromide papers on the market, Mr. Gear said that each had s special qualities, a knowledge of which was necessary before perfect results ould be obtained. The choice of surface was a matter depending on the haracter of the subject. Rough-surfaced and tinted papers, of which East-an's "Royal" was an excellent variety, were especially suitable for broad ffects. Development was an important factor, and required great care. With ery thin negatives it was often desirable to carry on development of the print little beyond the proper density, and then regain the required density by eans of a reducer. A good formula for bromide paper was as follows: Ietol, 25 grains; quinol, 12 grains; soda sulphite, ½ ounce; soda car-onate, ¼ ounce; potassium bromide, 8 grains; water, 20 ounces. This ight be used of full strength or diluted with half its bulk of water.

North Middlesex Photographic Society.—December 13, 1897, Mr. ummery (the President) in the chair.—Messrs. F. Gaudon, J. B. Edwards, and . Jones were elected members of the Society. The business of the evening as the receiving of nominations for the various officers, election to take place the annual general meeting on January 10. The Secretary, Mr. W. Taylor, d the Assistant Secretary, Mr. W. J. Simpson, having found it necessary to tire, Mr. J. Durston and Mr. G. J. Haviland have consented to act respectively their stead if elected. Mr. Crane showed some plates, which had sensitive markings across the film, and one which showed as half a positive d half a negative, and asked if any explanation could be offered. The sensitive bands were said by Mr. MacIntosh to be most likely caused by the ht in the dark slide, but no satisfactory explanation was offered as to the her, except that it looked as if it had received supplementary exposure, ther in development or before. After some further discussion, the meeting minated.

DECEMBER 20, Mr. Henry Smith in the chair.—Mr. H. STUART read a per on

VARIOUS ENLARGING METHODS.

e subject was made as elementary as possible, as this was a beginners uing. The lecturer described the various methods of enlarging without a condenser, the chief point dwelt on being the getting of even illumination of the negative; two lights, say incandescent burners, placed on either side of a white screen enclosed in a box, and placed close up against the negative, being one method, enlarging by means of daylight, by placing the camera up against a window, with a reflector at an angle of 45° outside, being another. He then explained the principle of the condenser, this simply acting as a collector of the rays from the source of illumination, say an oil lamp or oxy-hydrogen lime light, and then condensing them so that the apex of the cone of rays falls within, or very near, the projecting lens, thus utilising all the light, the even illumination on the screen depending upon the adjustment between the light, condenser, and projecting lens. He illustrated by diagrams how the screen looked when the light was not properly centered, or when the light was too near or too far from the condenser. A discussion took place afterwards, in which Messrs. H. W. BENNETT, CHILD BAYLEY, MACINTOSH, MATTOCKS, and others took part.

Putney Photographic Society.—December 16.—Mr. F. O. BYNOE gave a lecture, profusely illustrated with lantern slides, on

THE CAMERA AND THE WHEEL.

The combination of the two pursuits was advocated, and the special features required in a camera specially adapted for the cyclist's use were enumerated in detail. Among these were: Fixed focus lens, shutter working at various speeds, ample supply of films without having recourse to dark room to replenish, ability to remove any single film which it is required to develop immediately. For successfully photographing near objects, the use of focussing magnifiers was advocated. All these suggestions were embodied in the camera recommended, viz, the Frena. A very fine series of slides from negatives made with this camera were shown, and the subjects included almost all branches of the photographic art, from a print copied from a book to a mountain many miles distant. A show of apparatus, including an arrangement for adapting a cycle to form a camera support, for time exposures, and an improved carrier for carrying the camera on a cycle, concluded a most interesting evening.

Birmingham Photographic Society.—December 14.—Sir J. BENJAMIN STONE, M.P. (President), gave an interesting lecture upon

THE HOUSES OF PARLIAMENT.

Many excellent views were shown, interior and exterior, and a description was given of each slide. The lecture was concluded with a number of slides of prominent members of both Houses. Sir Benjamin said that he intended presenting the photographs to the nation in the form of a contribution to the National Photographic Survey.

Isle of Thanet Photographic Society.—December 14.—Mr. MCKELLEN gave a demonstration of his

INFALLIBLE HAND CAMERA.

Mr. McKellen, after briefly introducing the subject, gave an admirable and lucid explanation of the camera which bears his name, being followed with ease, as he exhibited a camera having one of the sides removed and replaced with a plate of glass. The smoothness of the work and the absolute certainty, coupled with its extreme simplicity, made a great impression on those present, and all were loud in their expressions of admiration. Mr. McKellen also handed round for inspection a novel form of view-meter and finder combined.

Leeds Camera Club.—At the above Society's rooms, on Wednesday evening, December 15, Mr. C. C. VEVERS delivered the fourth of a series of elementary lectures in "Photography."

PRINTING

was the subject treated upon on this occasion. The lecturer, after briefly explaining the theory of photographic printing and the numerous processes followed by different workers, explained fully the routine of producing a print upon gelatino-chloride paper—a process he recommended for the beginner, not because it possessed any artistic merits over other methods of printing, but because of its simplicity and general popularity. Mr. VEVERS described many ways of improving and "dodging" negatives, and showed how prints can be improved by "faking." For incorrect contrasts, due to over or under-exposure, for example, he showed how excellent results might be obtained by coating the back of the negative with matt varnish, and increasing density where required by working up with crayon, paint, or pencil. Vignetting, printing in cloud, and many other useful dodges were explained, and examples shown.

Newcastle-on-Tyne and Northern Counties Photographic Association.—December 14, the President (Mr. W. Parry) in the chair.—Four new members were elected. The evening was devoted to the lantern, a good collection of slides being provided by various members. Amongst others, slides were shown by Mr. W. Parry (President), Mr. E. G. Lee (slides by carbon process), Mr. Bell, Mr. Hedley Robinson, Mr. Ridgeway, Mr. W. E. Cowan (a very fine set of flower slides). Several of the newer members also brought examples of their first attempts at slide-making, which, on being projected, were criticised by those more experienced in the art. Mr. John Watson also showed a fine set of slides by Paul Martin, illustrating night effects in London streets, &c.

FORTHCOMING EXHIBITIONS.

1897.
December 28–Jan. 1. Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough-road, S.E.

1898.
January 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.
,, 29–Feb. 26. Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.

January–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.
April 22–30 ..... National Photographic and Allied Trades Exhibition A. C. Brookes, Temple House, Temple-avenue, E.C.
,, 27–May 14..... International Photographic Exhibition (Crystal Palace), R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE GUM-BICHROMATE PROCESS.

To the EDITORS.

GENTLEMEN,—I notice in your last issue that the preparation of the gum-bichromate printing paper by saturating with the bichromate and drying before applying the carbon mucilage is spoken of as new. Having worked with my late father so many years ago in this direction, I am not surprised at recent workers describing as new what is so to them. My father made many experiments, working occasionally by that method, but he found little, if anything, was gained, the principle involved being that, with the bichromate still in its easily soluble condition, the carbon and gum mucilage when applied to the surface absorbed into itself sufficient bichromate to sensitise it, and to a great extent this is true, but not always, for, under some conditions of the mucilage and a very drying temperature, it does not penetrate sufficiently to give the best results for some subjects, nor can the purity of the whites be attributed simply to this method, it rather depending upon the character of the paper employed.

I do not think any one could say there was any lack of purity in the whites in some of my father's *earliest* specimens lately exhibited at the Crystal Palace. I notice Mr. Packham in the discussion says "he thought that with the old method there was no real certainty as to what the result would be;" one is prompted to ask, Why? As I read the description of the developing in your issue, I am not a little amused.

Wherein I think my father got annoyed in the early stage of this work was that those who naturally he expected should know better threw cold water on a new process because it did not give results in *every way* equal to others that had been worked for years; I am glad to see that a better spirit prevails to-day, and that there are a goodly number who exercise more common sense.—I am, yours, &c., W. POUNCY.

Dorchester, December 14, 1897.

[Mr. Pouncy's interesting note arrived too late for insertion in our last issue.—EDS.]

To the EDITORS.

GENTLEMEN,—Your leader-writer on the *Gum-bichromate Process* in your issue of December 10 is extremely kind in acquitting my colleague, Monsieur Demachy, and myself of knowledge of the etching process called *aquatint*, of which he rightly says every one who has a knowledge of the fine arts or engraving is quite aware.

Armed, therefore, with the benefit of this stupid ignorance on our part, will you allow me to state the real reason why we applied the term *photo-aquatint* to the newly introduced process of printing in gum pigment?

It was not by any means meant to express a relation to, or imitation of, aquatint as understood by etchers. The latter term is itself a misleading one. It expresses the effect of an etched plate *in imitation* of water colour or wash drawings. Gum pigment prints are not imitations of water colours, but are *actually* water colours, in which nothing remains on the paper but pure water colour and a little gum. The colour is not even held on the surface in a skin or film of gelatine, as is the case with other carbon printing processes. The term photo-*aquatint* is, therefore, peculiarly applicable and appropriate. Etched aquatint has no monopoly of the term.

With regard to the prior claim of Mr. Huson, we confess, this time, that we were in complete ignorance of the fact, and, in this case, think it can hardly be said "that every one who has a knowledge of the fine arts or engraving is quite aware of it." From what we have now heard it would seem that this method is an imitation of an imitation, an imitation of etched aquatint which is itself an imitation.

Your esteemed contributor, "Cosmos," in his notice of the same subject, is as amusing and characteristic as ever. One would never dream of taking him seriously. I, for one, would never do so, remembering with gratitude the signal services his amiable writings have rendered to the Photographic Salon from the foundation of that Exhibition to the present time. It has been said that, in this respect, he has been as it were a Jesuit in disguise. I do not know how that may be, but, disguised or not, we could not afford to miss him.

The references to the claim for discovering the principle of presensitising the paper itself are really delightful. It appears that "in o issue of October 22 a correspondent (Mr. Lewis, a very old hand) me tions that he has habitually worked in that way. Hence it is clear th there is no novelty whatever in this method of working, as is now beir claimed for it." I believe that the only novelty claimed by us, in o book (if, indeed, we claimed any), was the *publication* of the fact. We sai I hope in a modest and unassuming manner, that it had "not been not before or, at any rate, published, with regard to any form of carbo printing." The "old hand" is, however, welcome to any benefit which his occult experiments entitle him. The question of *prior pu lication* remains as it was, unless, indeed, "Cosmos," serious for onc will inform us how, upon this point, "THE BRITISH JOURNAL OF PHOT GRAPHY is a witness to the fact that this idea was put into practice man years ago."

Shall we ever again hear that, if pigment pictures are to be develop at all, this can only be successfully accomplished by attacking the fil from the back? and, after the examples shown at Mr. Packham's lectur will Mr. Chapman Jones, "Dogberry," "Free Lance," or your leade writer, the staunch upholders of this *dictum*, take up the challenge whic I made in your columns in your issue of March 1896?

With regard to the qualities of the gum pictures exhibited at the Salo concerning which the amiable "Cosmos" is so contemptuous in h scorn, the producers may, I think, console themselves with the opinio of an equally able critic, in a publication of world-wide reputation. refer to the article, running to thirty-two pages, by Monsieur Robert la Sizeranne, in the current number of the *Revue des Deux Mondes*. Th distinguished author is, I believe, not entirely unknown in this countr I recommend his writings to "Cosmos" and your leader-writer. Th will find them very instructive.—I am, yours, &c., ALFRED MASKELL.

Ilfracombe, December 15, 1897.

VIGNETTING APPARATUS.

To the EDITORS.

GENTLEMEN,—I am sending to you by this mail a few prints showi the effects produced by the use of the vignetting apparatus, Patent N 15,087, of which I am the inventor and E. A. Harris promote I had hoped to have sent these prints and details in time for the fort coming BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, but the patent is on just to hand; however, you may have space for notice in THE BRITIS JOURNAL OF PHOTOGRAPHY itself. The prints sent show the various effec obtained by using different discs and backgrounds.

In working the apparatus the amount of vignetting to be in t negative is under control while focussing the sitter, the disc bei brought nearer the lens on the sitter by a slight turn of the wheel show in the print of camera front enclosed, and the slight movement of t camera when arranging causes the disc to swing to and fro with a gent motion for about three minutes, the balance of the same being on knife edge or bar. The disc swinging towards the lens reflects light mo or less, according to the tint of the disc, and when swinging from the le light is transmitted through the woven wire or celluloid of the sam We claim for this apparatus that more perfect vignetting is obtaine the printer's time saved, and the photographer saved the vexation inartistic vignetting, and, lastly, for myself, the satisfaction of havi all my patrons highly pleased with the results.

We hope to put this apparatus on the English, American, and otl markets.—I am, yours, &c., E. J. EYRES.

76 *Gates-street, Victoria, B.C., November* 9, 1897.

[The prints lie at our office for the inspection of those intereste We may say that Messrs. Eyres and Harris's vignetting apparatus fully described in this JOURNAL of August 27. It should also pointed out to our correspondents that in the JOURNAL of Septemb 3, page 575, Mr. A. L. Henderson states that he had exhibited vignetting arrangement on the same principle many years ago.—EDS

METALLIC CONTACT PRINTING WITHOUT LIGHT.

To the EDITORS.

GENTLEMEN,—In January 1864, Monsieur E. Vial, of Paris, read paper on *A Method of Instantaneous Engraving on Metal* before th Society of Arts. There were present at the meeting Mr. Joubert, M John Leighton, and Mr. George Cruikshank. M. Vial stated that h invention had been patented in this country and also in France. Th Imperial Institute of France had reported favourably on his process, an thanked him for his communication. M. Vial briefly stated the principl which was simply the application of a fact *long since known*, which is, we plunge a piece of one kind of metal into a saline solution of a met of an opposite nature, the solution is immediately decomposed, and th metal reduced is precipitated upon the former with a considerab amount of adhesion. The invention was divided into particulars of thr processes.

Process No. 1.—Make a drawing upon paper in a metallic ink—solutio

of lead, bismuth, mercury, or silver, according to metal to be engraved upon. The drawing is then placed face down on a sheet of zinc or steel, &c., and covered at the back with a piece of cloth slightly damped, and placed under a press. In two minutes the design is formed in slight relief, forming a solid and resisting body. In order, however, to obtain sufficient relief for printing purposes, it is necessary to employ corrosion by acids, which, assuming copper is being precipitated on to zinc, the acid will have a less degree of affinity for the copper than for the zinc attacking the latter, the former serving as a kind of protecting varnish to the lines.

Process No. 2.—An engraving is placed with its back upon a metallic solution, and the aqueous liquid penetrates the paper slowly by imbibition only between the lines of the greasy ink. This sheet is then placed on a metal plate and pressed, as in process No. 1, forming a negative in relief. Photography does not operate with more promptitude or fidelity. The plate is then placed on a ten per cent. bath of nitric acid. M. Vial here states that the better results are obtained with a solution of chloride of gold, two parts gold to 100 distilled water, than with copper, lead, &c.

I noticed in the article published in the *Photogram* on the patent of this process lately obtained that chloride of gold has one of the claims. M. Vial further stated that he had experimented with solutions of chlorides, sulphurets, bromides, and iodides with marked success, also impregnating an engraving with pyrogallic acid, and transferring same to a fabric prepared with sulphate of iron.

Process No. 3 consists in making an autographic, lithographic, and photographic transfer by the means of bitumen or bichromates, and thus producing a transfer in greasy ink—in the former process, and a suitable resist from the latter. When a steel plate, with transfer, &c., on its surface is plunged into the acid solution of sulphate of copper, with a small quantity of nitric acid, those parts of the surface that have not received any portion of ink are immediately coated with copper. The solution penetrates, at the same time, by imbibition through the greasy matter of the ink, and reaches the metal beneath, when a voltaic pair, copper or steel, is immediately constituted, the copper forming the negative pole, and the steel—not yet attacked—the positive. An electro-chemical decomposition of the sulphate of copper then takes place, and at the same time the steel is attacked by the sulphuric and nitric acids. The operation proceeds without any effervescence. In ten minutes the steel plate is withdrawn perfectly engraved. When the copper is removed by ammonia, all the gradations of our engraving, from highest lights to the deepest shades, are produced at *one* simple operation, without any "stopping out" whatever, the length of time each part is under the action of the acid being always proportioned to the thickness of the layer of ink at that particular part. When the plate is first placed in the bath, the copper instantly covers and protects from the acid the exposed surface. The acid next attacks the finest lines, and, when these are engraved, the copper spreads laterally from the edges, and "stops out" those portions whilst the deeper lines resist the deposit of copper for a longer time, and so on to the deeper shades, which will still remain longer exposed to the action of acid, whilst all lighter parts are effectually protected by the copper deposited, so that each line will be infallibly engraved to a greater or less depth in exact proportion to the thickness of its layer of ink. This prevents lateral corrosion, and, on the contrary, causes each line to narrow as it deepens, and to assume, as near as possible, the V-shaped form.

In the discussion that followed, Mr. George Cruikshank stated that, from what he had seen of the process, and judging from specimens exhibited, he considered it a very valuable addition to the means of producing works of art, and he should be delighted to be allowed to make experiments himself.

Concerning this *new* idea of producing contact printing without light, I might mention that, nearly twenty years prior to Vial's invention, M. Nièpce de St. Victor (nephew of the father of photography, M. Nièpce) invented a process, only, unfortunately, the pictures faded. Some two years afterwards M. Nièpce de St. Victor succeded in fixing same, but obtained this result only by exposing the *already made picture* to the action of light for two minutes. Possibly we may shortly hear of this as a new patent. If you have space at some future time, shall be glad to send you particulars. I have made it my hobby to hunt up all old processes, and I have notes of a curious collection.—I am, yours, &c.,

40, *Houndsgate, Nottingham.* JAMES KIRKWOOD.

MOUNTS.

To the EDITORS.

GENTLEMEN,—Is it not time some improvement was effected in the mounting of photographs supplied commercially?

Why should the popular "cabinet photo" be still put on a card as antique as it is inartistic, and which has done duty for years?

It is strange that high-class firms should take so much pains to turn out a good photograph, and then spoil the effect by pasting it on an old-fashioned mount of a shape and size perfectly ridiculous from an artistic standpoint.—I am, yours, &c., PROGRESS.

PHOTOGRAPHIC HISTORY: A PROTEST.

To the EDITORS.

GENTLEMEN,—Under this heading you published in your issue of December 17 a letter signed "An Old Member of the Photographic Society." Might I be allowed to strongly protest against such extreme expressions as the writer has made use of? Mr. H. P. Robinson has his faults like the most of us, but because his opinions differ from some one else's is surely not sufficient reason that he should be held up to the public as a spectacle for derision.

I have always been under the impression that a man is at liberty to change his ideas on a subject, and for the benefit of your correspondent I must quote the old familiar words, "Tempora mutantur et nos mutamur in illis." My sympathies are not in any way given to pictorial photography, as I personally much prefer to read and profit by the experiences of such research-workers as Messrs. Lippmann, Ives, Haddon, and Grundy, to only quote a few; but at the same time I am not at all blind to the advances pictorial photography has made during recent years, and in my humble opinion Mr. Robinson's productions are second to none—an opinion, I may add, that is not held by myself only. Mr. Robinson has done much to popularise this class of work, and perhaps there are few men who can claim to be so well known in the photographic world; and, as is invariably the case with prominent figures, there will always be people who will lift their hand against them. Before I close I must add that I consider it would be very advisable that when such letters as that of the "Old Member" be published that the writer should use his full name and not hide under the cover of a *nom-de-plume*. Such statements as he has made against Mr. Robinson are not such as to reflect any credit on himself as a member of the Royal Photographic Society; it would have been better to have followed Cicero's advice, "Sit sermo lenis."—I am, yours, &c., A. KENAH.

2, *Eliot-hill, Lewisham, S.E.*

PHOTOGRAPHIC HISTORY.

To the EDITORS.

GENTLEMEN,—Many of your readers must have felt ashamed to read the anonymous personal attack on Mr. H. P. Robinson in your columns, and I must say that I think "one who undoubtedly more than any one else living has the respect, one might even say affection, of every sincere photographer"—to quote your contemporary, *The Amateur Photographer*—is at least worthy of something very different to this most ungentlemanly treatment.—I am, yours, &c., FAIR PLAY.

PHOTOGRAPHIC HISTORY AND PERSONALITIES.

To the EDITORS.

GENTLEMEN,—It may be that there comes over our much-appreciated BRITISH JOURNAL OF PHOTOGRAPHY, as did, we are informed, over the early numbers of *Blackwood's Magazine*, "a natural demand for libel." This may have been as it should be in the "twenties," or before advancing education had taught all but the lowest good manners, but unchecked, anonymous, personal abuse of the coarsest kind is so rare in respectable journals at this refined end of the century that some of your readers will excuse, and perhaps others thank you, for the curious sample in your last of scurrilous letter-writing at my expense, in which is transparently visible those potent motive powers, envy, jealousy, and, I fear, failure. I have no other way of accounting for such a letter, except that I must have done the anonymous writer a serious service. I know that I have been more civil to him than he deserves. I have had to regret being very reckless in that way. Fortunately, I am one of those who think that, the more vulgar and clumsy the abuse, the less mischief it does, and I am able to wish my gentlemanly vituperator the compliments of the season, a better command of a temper for inheriting which I sincerely pity him, and as clear a conscience as "it leaves me at present."—I am, yours, &c., H. P. ROBINSON.

[We are sorry our friend Mr. Robinson has found himself obliged to assign an interpretation to "An Old Member's" letter which we did not think it would bear. That letter was inserted without malice on our part, and we, of course, had no share in its production; nevertheless, the responsibility centres entirely in ourselves, and the measure of Mr. Robinson's chagrin is also the measure of our own regret. At this season of universal goodwill we may fittingly close the incident by asking our readers to join us in wishing Mr. Robinson long enjoyment of the eminent position in the photographic world to which he so honourably attained many years ago.—EDS.]

"HONOUR TO WHOM HONOUR IS DUE."

To the EDITORS.

GENTLEMEN,—In a letter published on p. 799, under the above heading, your correspondent in a most emphatic manner asserts that our patent No. 13,751 has been anticipated some thirty-four years.

As we could not allow this erroneous dogmatism to go *nihil dicit*, we have been to the trouble of searching for this antiquated process, and find that it is a method of engraving by acids or by voltaic action, the resist being formed by a deposit of copper or analogous metal, the crudeness of which it is not our province to decry.

In the Christmas number of the *Process Photogram*, the specification of our patent is published almost *in extenso;* likewise in your JOURNAL, No. 1951. We fail to comprehend how any one with a discriminative mind could claim in this ancient process of M. Vial's anticipation of our method of producing prints upon such material as P.O.P. from the surface of a metal plate prepared by the usual modern photo-mechanical methods with an acid-resisting negative replica of a photograph, drawing, or print. There may be some similarity of material used, but the procedure and product are as far apart as the poles.

We feel that, when you compare the two processes, you will do us the justice to acknowledge that the damaging remarks and innuendoes were made without warranty. We are confident that, in endeavouring to show up reinventions, you do not wish to handicap genuine inventors in the up-hill work of obtaining credit for their labour.—We are, yours, &c.,

H. SOAR AND J. W. COOPER.

[The process of Messrs. Soar & Cooper appears to us to be essentially different to that [attributed to M. Vial. Offhand, we should say that Messrs. Soar's method of producing prints is not only novel, but one of great practical value.—EDS.]

THE LATE P. MEAGHER.

To the EDITORS.

GENTLEMEN,—Returning to Rome after a long vacation, and looking over the file of THE BRITISH JOURNAL OF PHOTOGRAPHY, I find a note with the above heading which ascribes to Mr. Meagher "the folding baseboard" of the folding-body camera.

The facts are that this feature of camera construction was invented by me, and was comprised in the folding camera, for which I subsequently took out a provisional patent to prevent any one else from appropriating it. I was in Crete at the time of the invention, and sent out working drawings to a friend in London to have a camera made from them. They were sent to Mr. Meagher, who, after some months, returned them, saying that the camera was not workable. Returning myself to London later, I had the camera made by Mr. Hare, after a working model constructed by myself in Crete. I was naturally very much surprised, on receiving Meagher's catalogue in the next year, to find him, after having my drawings, introducing my folding baseboard, though without other features which were comprised in the camera as later constructed by Mr. Hare, and without any credit to me.

My camera folded like a book, front and rear baseboard representing the covers, and was the first advance beyond the Kinnear.—I am, yours, &c.,

W. J. STILLMAN.

Rome, December 12, 1897.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED :—

A. E. England, The Triangle Studio, New Barnet.—*Photograph of John Hawke, Esq.*

GREAVES.—Probably of Spooner, Strand.

A. B.—The names, so far as we know, are not in such use. We think you would be quite safe in using either.

PHOTOGRAPHER.—We believe Messrs. Percy Lund, Humphries, & Co., Bradford, can supply you with what you require.

SOUTH WALIAN is informed that the Electric Sign Company, 149, Fleet-street, E.C., manufacture day and night signs.

W. C. CROFTS; J. H. BALDOCK; J. F. T.—Many thanks for the correction. See a paragraph on the subject under News and Notes.

CORFU.—Burton's work on printing methods (Marion & Co.) or Wilkinson's book (Hampton & Co.) will give you the desired information.

W. E. GREEN.—The numbers have long since been out of print. In Mr Hepworth's *Book of the Lantern* some useful and exhaustive instruc tions are given.

KEEPING PRINTS FLAT.—H. F. B. asks: "Will you kindly inform me how can keep photo prints from curling as they dry. I am anxious to kee some prints perfectly flat and smooth after toning and washing, withou mounting?"—In reply: Dry the prints between blotting-paper unde pressure, and, if necessary, roll them under heavy pressure afterwards.

BAS-RELIEF PHOTOGRAPHY.—G. H. E. says: "Will you be kind enough t tell me where I can get information to enable me to do bas-relie photographs? I notice in this week's issue of THE BRITISH JOURNAL O PHOTOGRAPHY a par. saying one method was given in some issue i April last."—THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 189 contains a great deal of information on the subject.

STUDIO.—H. HUNTER says: "I have just opened a studio; it's 20×12, si feet each end, opaque, and four feet, opaque, each end at eaves; direc north light, shadow side covered in; the glass on north side is ground Would it be best to have curtains over glass on north side, and wha colour and material would you recommend? An answer will oblige."— In reply: Light-green or dark-blue blinds are what we should recom mend. Unbleached holland would also do.

WASHING PRINTS.—FIXING asks: "Would you kindly give me your opinio on the following, and greatly oblige—Do you consider prints washed i the following manner would be sufficiently washed: Paper P.O.P washed separately from one dish to another in running water for half a hour, then passed into an alum bath for five minutes, then passed fo another half an hour in running water, *i.e*, one hour's washing singl and passing from one dish to another, with the alum bath midway?"— One hour's washing, without the alum bath, if the work be carefull done, ought to be sufficient. But it *must* be carefully done.

OLD PYROGALLIC ACID.—H. E. R. writes: "Will you kindly tell me what can do with some pyro I have? A friend of mine came into half-a-doze ounce bottles of Schering's pyro. He could not tell me how long the had been in stock, but to all appearance they are all right. I hav tried one bottle. The cork was dark, and the stock seems to be ver muddy and rather dark, and the negatives developed with it are not a all so satisfactory as I should wish, for which I give the pyro credi Am I right, and could you tell me if the stuff is useless?"—The pyro evidently very old, and, if with a full dose of sulphite of soda o metabisulphite of potash it does not work satisfactorily, it had bette be discarded.

RESIDUES.—A. MORRISON writes: "Would you kindly tell me a simp method of recovering the *silver* from washings of prints? I am present trying the salt method, putting into the barrel a handful salt, but it won't get clear, so I think it is not throwing it dow properly. Am I doing right? If so, how do I gather up the deposit a the bottom? Is there any certain quantity of salt that should be added Any other simple method will be appreciated."—The method bein pursued is quite right. A little hydrochloric or nitric acid will aid i the precipitation of the chloride. The quantity of salt is, of cours dependent upon the quantity of silver present, but it is not advisable add more than is necessary. When no further turbidity is produced, n more salt should be used.

STUDIO.—IRELAND writes: "I am about to build a photographic studio twent six by twelve feet running east and west, with a north light. I wou feel obliged if you would kindly answer me the following questions 1. Which end would be best for sitter; the eastern end would suit best? 2. What substance should rafters be, and what distance apa 3. Would you advise me to put in glass in roof whole, as it would more watertight than in laps, as studio will be much elevated and danger of being broken by stones. &c., also what kind of glass would best to use? 4. What kind of blinds would be best, colour or materi 5. What colour should I paint dark side of studio. 6. Height fro floor to eave will be eight and a half feet, but I will not be able to ha more than three feet of it glass. Will that suit; I can have as mu glass in roof as required?"—In reply: 1. We should advise a bac ground at either end, one to be used in morning light the other in t afternoon. 2. Twenty to twenty-four inches. 3. Yes; but we imag such large squares would be very inconvenient for the glasier to hand 4. Unbleached, or light blue, window holland. 5. Dark French g will be very suitable. 6. Yes.

BURNISHING.—J. A. FROST says: "I have been troubled for some time p by not being able to get a burnish worth calling a burnish successful I find that if I heat the roller (one of Marion's cabinet burnishe heated by gas running through the top roller), so as to get a glos surface, the prints come up very badly. I have enclosed two specime of the worst ones. I should like to know if the roller's surface is fault, it was newly nickelled some nine months ago, and seems fairly good condition now; or would it be the prints being damp too dry, they are usually placed before a stove previously to b nishing? Or whether it is the fault of the mounts. as they seem to rather inclined that way? The prints will go through fairly well i use soap on them, but, of course, that takes time, and I think th ought to go without its use. I have thought sometimes that the so may have had an effect on the nickel, but the reason I used the so was because they would not burnish without. I may say that I h always been able to burnish before all right, but with other mou and a different burnisher, but the same paper."—In reply: T pressure seems to have caused a separation of the layers of paper which the mount is composed. This will, doubtless, be obviated if prints be lubricated with soap in the usual way, as that reduces friction. The soap has no effect on the nickel.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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NOTICE OF REMOVAL.

JANUARY 1, 1898, THE OFFICES OF THE "BRITISH JOURNAL OF PHOTOGRAPHY" WILL BE REMOVED TO No. 24, WELLINGTON-STREET, STRAND, LONDON, W.C.

EX CATHEDRA.

E have to acknowledge the many kind expressions of asonable good-will that have reached us from readers and ends of the JOURNAL during the past few days. To them l to all who read these lines we cordially wish, in the iest meaning of the term, a Happy and Prosperous New ar!

* * *

THE London correspondent of a provincial contemporary ks a question that has been asked many times before, "Is e art of the painter doomed? There can be no doubt," he old enough to add, "that the new" (*sic*) "photography is idly becoming a fine art." Ample, if not startling, proof of e fact was afforded to him by an "exhibition of some coloured photographs by Messrs. Walford & Co., who hold the secret of a new process, which promises to revolutionise the best work yet done by the camera. The collection of examples was most interesting, and," he adds, "most beautiful. The colour is transmitted in the process of development, and in the landscape and marine work is diffused so near to nature as to resemble the finest water-colour drawing. Two portraits also were shown, which, to exquisite normal photography, added the most delicate tints of complexion. Above all, this class of work can be placed on the market at a price which brings the pictures within the reach of the humblest cotter, while, on the merits of art, they would do honour to any gentleman's house. Two distinguished artists expressed their astonishment at the perfection of the system." The "transmission of colour by development" is development up to date with a vengeance.

* * *

MESSRS. CADETT & NEALL are issuing the following interesting details with regard to the Cadett Spectrum plate. At the present moment, they point out, no safe light has been discovered whereby these plates can be manufactured of higher speed; but they hope shortly to introduce another plate, which, while being less perfect in the blue-green than the Spectrum, will meet the requirements of a much quicker plate. With the following light filter all visible colours are rendered correctly according to their luminosities. The filter should be made with a cell one-eighth of an inch thick internally, containing a solution of pure chromate of potash, one part of the salt to 250 of distilled water, made slightly alkaline with pure caustic potash or carbonate of potash; the chemicals used should be of absolute purity. The above strength of chromate is for use with the electric arc light. For daylight a ten per cent. solution of the chromate should be used. The entire manipulation, say Messrs. Cadett & Neal, should be carried out in total darkness until the negative is nearly finished in development, when a moderate amount of the dark-room light may be cautiously used.

* * *

WE learn that, in connexion with next year's Crystal Palace International Exhibition, the arrangements for Section III., Portraiture and General Technical Photography, are in hand. It is proposed to allow exhibitors to take a definite area of the wall space to themselves, or, if they prefer it, an alcove. On

such space they can hang their exhibit as they think best, and, subject to the general decorations, can drape it to their own taste. Over and above this, framed photographs will be received for hanging as at Pall Mall by a hanging committee; for these no space need be reserved by the exhibitors. Some of the professional photographers, particularly those who go in for general photography rather than for portraiture, are taking floor space, and intend having little reception rooms at the Palace. As regards apparatus-makers and dealers, there only remain five 24 × 24 feet spaces and a few odd areas. The former the Committee are cutting up, when required, into 12 × 12 square. The loan collections are getting on, particularly the Astronomical Photography Section, for which a number of unique exhibits have been promised.

* * *

We have perused with a good deal of pleasure a well-compiled handy reference book, the *British Almanac* for 1898, published by Messrs. Le ts. The volume is cast on lines similar to those upon which Whitaker is got up, and it is a very good collection of general information. Last year Messrs. Letts carried out a scheme whereby the purchasers of a copy of their *Almanac*, on production of the book to one of a list of photographers printed in the book, could obtain a cabinet photograph of himself for nothing. Four London and forty-six provincial photographers thus allowed their names to be printed as willing to take photographs for nothing.

* * *

This year the scheme has been modified. On presentation of the coupon in the book to the nearest photographer prior to June 30, 1898, the owner of the volume may obtain free a *carte-de-visite* portrait of himself, or, on payment of 2*s.*, a cabinet-size photograph. Nine London photographers and 104 country photographers have handed in their names as willing to do business in this manner. According to the conditions, the photograph that may be supplied (*i.e.* paid for or unpaid for) is the copyright of the photographer. We must again point out, as we have previously done, that, where payment has been made by a sitter for a photograph, the copyright, according to a recent decision, is not the property of the photographer. With regard to the scheme as a whole, we do not think the 113 photographers who are supporting it are likely to derive much benefit from it. Still, it is less one-sided than the previous scheme, which did not give the purchaser of Messrs. Letts' book the alternative of having a photograph taken on payment of a sum of money.

* * *

We are informed that the medals awarded at the recent Glasgow International Photographic Exhibition have been sent to the successful competitors. The medals were prepared by Messrs. Thomas Smith & Sons, of Glasgow, and they are described to us as being exquisitely modelled productions. The Glasgow Exhibition is one in connexion with which everything appears to have been done excellently and in good taste.

* * *

In connexion with the affiliation of photographic societies, the Leeds Camera Club have arranged to hold on Wednesday, January 5, a lecture entitled *Picture-making with Small Cameras*, by Mr. W. Thomas. The meeting will be held at the Grand Restaurant, Boar-lane, Leeds, and any member of an affiliated society who may not have received direct invitation will be welcomed.

LOOK AT YOUR INSURANCE POLICIES.

The present being the season from which most fire insura policies date, it will by no means be a work of supererog to return to an important subject which we have on a for occasion dealt with, but which, singularly enough, we yet to be misunderstood to a very remarkable extent, and by m otherwise shrewd business men. We would at the outset to each one of our readers: Seize the present opportunity unearth your policy from its hiding-place and read it thro from beginning to end. Inquiries we have made enable u say that of the large number we have interviewed on subject an extremely small number have gone through formality, but we assure all whom it may concern that it not be considered time thrown away, and the perusal will to give point to our further observations.

We have already pointed out that one of the first cla met with in an average policy runs to the effect that, if thing of the nature of an extra risk be done on insu premises, the policy becomes by that act of risk absolu void if the insuring company be not informed of the and consent to its being undertaken. Here at once let us that we only refer to the actual conditions set out; a matter of fact, the insurance offices are, in their own inter usually liberal in the interpretation of their policies; bu it will be seen by the dullest intelligence that, in the event a claim arising, the company has entirely the whiphand in of disagreement when the conditions laid down in t policies have been departed from. At the same time we assure our readers that, notwithstanding this liberality, honest insurer suffering from a fire will have an unexpe education as to the value of his property, and an educa that he would feel it would have been desirable for hi to have received before he sent in his claim.

Let us now look into some of these risks. There is not new to say about the acetylene matter; we can only re that up to the present the (tariff) offices do not, excep dealers in the apparatus, permit the generation of the gas, the storage of the carbide of calcium on insured premises, only permit its use when generated at a sufficient dist away from the premises and with certain specified safegu as to pressure, &c. If any one contemplating the employ of this gas have any lingering doubt as to the correctne our advice, we strongly recommend him to communicate the office he is insured with, describe his intention, and o account fail to have his policy endorsed with the sig sanction of an official of the office. There is no trouble w mentioning in doing this, and it would be the height of to abstain for fear the company might object—a course we know to have been indulged in in at least one instance.

We may now refer to another risk—heating appara whether stoves, or gas, or hot water. There is nothing familiar in this aspect of insurance, so that the local agent give any necessary sanction after seeing the apparatus in Yet here we may say we have been on many premises w the heating arrangements in use have been in direct contra tion of well-known and established rules.

In the same category may be placed the introduction of electric light. There is little chance here of going astr the installation is carried out by firms of repute; but there are many ingenious mechanicians in the ranks photography who might feel competent to do all the wi

: with their own hands, it will be well to point out that, ase of an electric installation, they should, upon its pletion, call in the insurance agent, and get his certificate the work has been done in accordance with a certain set ıles which the associated offices have laid down as necessary e adhered to in insured premises.

correspondent has pointed out that the use of acetylene is the only risk forbidden. As we write, there lies before us ply by an insurance company to one of their policy-holders asked whether he would be able to give a lantern ibition with compressed oxygen in use. The reply is worth ng. The company required a fee to be paid for each ibition. The same inquirer asked how about permission to a cinematograph? So far he has received no reply of a nite nature.

'here is one subject that may be considered of perennial ɔute—the value of negatives. Now, it is unlikely that any ıpany will consent to the fixing of a hard-and-fast line. ıally, a maximum sum is named in the policy, with nothing l as to the extent of the minimum. It is best, in having a ɛy drawn out, to get as near finality of arrangement as sible, to avoid the possibility of after-disagreements. One ng is, however, essential: there are few establishments possess some negative or negatives which, to the owners, ough the intrinsic excellence of the work or the demand for ɔlication purposes, are especially valuable. Such negatives ·uld be specifically described, and a definite value put upon m in the policy, and, when further negatives of similar ɔortance are made, the fact of their existence and their ue should be endorsed upon the policy.

At this stage it should be noted, by those who hold a large l fluctuating stock of frames, mounts, and materials gene-ly, that there is a possibility of the policy containing what ɔalled an average clause. A very well-known photographer, ıen changing his studio some years ago, fortunately dis-vered, pasted upon the side of the usual letterpress of his licy, a little printed slip of paper, innocently stating that e insured property was subject to average. This means as lows: Supposing that the various items in his policy ɔunted up to a thousand pounds, then, in the event of a fire ɛurring when he happened to have an unusually large ɔck on hand, say, fifteen hundred pounds' worth, if five ndred pounds' worth were destroyed by the fire, he would t get that sum, but only that proportion of it as 1000*l.* is to 00*l.* This, in the supposititious case, would amount to 3*l.* odd. It need not be said that the gentleman we name ıisted upon the elimination of this "average clause."

We have now only to deal with one other aspect of the bject — other people's property on the premises. An dinary policy does not cover property belonging to others an the insurer. Hence, in the case of valuable articles or ɛtures left to be photographed, the photographer, in the ent of a fire damaging them, has no legal claim upon the surance office. The same rule holds good with regard to the ɛaring apparel of *employés* or relatives. Hence it will ways be well to have included in a policy a declaration that covers losses of wearing apparel belonging to *employés* or latives, and, if possible, losses to property intrusted to the surer for the purpose of being photographed.

Finally, let us say there can be no imputation upon a man's tegrity because he takes every step to safeguard his interest the case of a fire; so far, indeed, is it from being so that we consider it distinctly indicating the wanting in ordinary business prudence if, especially when the way has been pointed out to him, he omits the carrying out of all such precautions.

Winter Photography.—Seldom have photographers had such opportunities of obtaining pictures of hoar frost as during the past few weeks, as they have been continuous. Usually they last for a few days only. Unfortunately they have been accompanied by thick fog in London and its suburbs of a very non-actinic nature. Still, fog and gloom are concomitants of hoar frost, and should not be entirely ignored in photographs. However, if the fog is of a yellow character, it will be exaggerated in the photograph, to the detriment of the picture. This exaggeration may, however, to a great extent be ameliorated by the use of orthochromatic plates—those specially sensitised for the yellow rays, as with eosine. With such plates the yellowness of the atmosphere is largely ignored, although the country has been as white as snow, so thick have been the crystals of ice, yet a photograph of hoar frost, however thick it may be, is quite distinct from one of snow.

The most charming pictures of hoar frost are the most difficult to obtain, inasmuch as the opportunities of securing them are rare, and, when they occur, they last but for a very short time—often a few minutes only. They are when the trees and shrubs are thickly coated and the sun is shining. Then the crystals sparkle like a blaze of diamonds, but for a very brief period, as, even at this season, there is sufficient heat in the sun's rays to quickly melt the crystals, and then the charm has passed and gone. These chances occur more frequently in the early spring than they do during the depth of winter, though we witnessed them a few days ago, but unfortunately our camera was at home. Pictures of this type make most charming lantern slides, and never fail to "bring down the house" whenever they are projected on the screen. We will add a practical hint for taking negatives of this class of subject: Always employ backed plates, or halation, which materially mars the result, is almost sure to occur; also keep the slides charged with plates for use at a moment's notice. Almost any garden shrub or tree, when covered with the frost, becomes a subject worth photographing.

Still More Arctic Expeditions.—At the Swedish Anthropological and Geographical Society, Professor Nathorst recently gave some particulars relating to the expedition to Spitzbergen and King Charles Island, which has been arranged for next year, as well as some information as to the channel between the latter islands and Franz Joseph Land. It appears that sufficient money has already been subscribed to defray the cost of the expedition, and foremost amongst the subscribers is King Oscar. A vessel, the *Antarctic*, has been secured for the expedition from the Svend Foyn Company in Tonsberg. It is stated that seven scientists are to take part in the expedition, and it goes, of course, without saying that photography is to take a prominent part in it. In all these expeditions photography is announced to be to the fore, but it is surprising how comparatively few results are exhibited on their return, interesting though they would be, even if failures so far as photography is concerned.

Astronomical Cinematography.—M. Camille Flammarion is evidently an enthusiast, for, according to the Paris correspondent of the *Standard*, he has undertaken the task of cinematographing the sky, and as there is no cinematograph machine that will work from sunset to sunrise, and as the movement of the celestial bodies is very slow, he will content himself with taking between two and three thousand photographs per night, when the sky is clear. His idea is that this number will be amply sufficient to show the motion of the moon, stars, and planets without any break of continuity. It is stated that the object-glass to be used will embrace an angle of 180°, so that the whole firmament will be seen when projected upon the screen. It is further stated that M. Flammarion intends to follow up his undertaking by treating the

spots on the sun in the same way, and hopes to be able to show "those formidable vortices of fire in the sun's envelope as correctly as the movement of water and the breaking of the waves of the ocean are now shown." According to the writer, still greater achievements are hoped for. Every one will wish M. Flammarion success.

The Water Supply.—In few businesses probably is greater inconvenience experienced by a frozen water supply than in that of the photographic, as all who have met with it know full well; yet how comparatively few are the precautions taken to guard against it in the future. Many will remember their experience of three years ago, and the good resolutions made at the time as to relaying the main-service pipe deeper, further protecting the internal pipes, &c.; but we know that in a large proportion of instances nothing more was done beyond the resolutions made. Since then, however, there has been no real need for them, had they been made; but who shall say how soon they may be necessary? It has been said that, with our fickle climate, three hot days and a thunderstorm constitute an English summer, and a few cold days and a fall of snow a winter; but we do sometimes have more than that, and then we usually find ourselves quite as unprepared as we were for the winter of three years ago. A few simple precautions give but little trouble, even if in the end they have proved unnecessary; but, if it proves they were, what immense trouble and inconvenience they save. *Verb. sap.*

Made Abroad.—Most of us have this year received our full quota of Christmas and New-year's cards, and most must have noticed from the imprints that comparatively few of them are of home production except the design. The majority bear the intimation that they were designed in England and "printed in" "Bavaria, "Germany," "Austria," and elsewhere. If England is equal to designing the best "greetings" sold here, is it not rather a reproach to English printers, and Christmas-card producers generally, that we are not able, for some reason or other, to carry out those designs? The same applies to the majority of the annual supplements to the different illustrateds. They are, for the most part, printed abroad. Is this because the Continental printers have more perfect machinery than we have, or is it that the workmen are possessed of greater skill? The greater portion of the manufacture of photographic mounts and cardboard and photographic paper generally is now in the hands of the Germans and Austrians.

PLAIN LANGUAGE ABOUT THE SPECTRUM.*

I WOUND up my notes last week with the spectroscopic analysis of three inks for three-colour printing, and it is, of course, quite legitimate for Mr. White to retort that his is not photo-spectroscopic work. Granted. It is but preliminary to what I have to say.

I will at once proceed to photo-spectroscopic work. I have tested spectroscopically three plates. Sir, they did not take me a lifetime, they did not take me a year, nor a month, nor a week, nor a day, nor an hour. The actual period of exposures was thirty-five minutes. I now know what these plates will do and will not do. I am in the happy position of being able to read the cuneiform hieroglyphics imprinted theron. For instance, let me take one plate; what do I find? a deposit which may be described as a curve starting at F rising to a maximum at G½ H, and fading off rapidly beyond H. To Mr. White this is, of course, merely so many cuneiform hieroglyphics; but to me, and, sir, I do not wish to boast, to many others, this must convey the impression that the plate was a collodio-bromide emulsion; as a matter of fact, it was Albert's emulsion. Had I not actually coated the plate, I should have said from the spectrum that this was a collodion emulsion. It is a characteristic spectrum.

Now, what can be learnt from this? Possibly it would be better to defer this to a later period.

The next spectrum shows a curve varying from C¾ D to H.

The third spectrum varies from B¾ C to 6½ F and from F to H.

* Concluded from p. 823.

Let us take, however, Mr. White's next statement:—"The main re for the adoption of practical tests is this, that we do not meet with simple colours of the spectrum in nature." Thank Heaven, we have a statement with which I can agree. Will you imagine, sir, Mr. W White and I falling on each other's necks, mingling our mutual tear joy and adjourning to celebrate the occasion?

His statement reminds me of one made by a distinguished ph grapher, I fancy it was Mr. Andrew Pringle, at one of the Conference the Camera Club, when, in discussing a similar question, he said we not get a spectrum hanging on every tree. Granted, of course, say I.

But, once for all, the original source of colour is the light incident the surfaces of objects. In nature this is usually white light— may I quote the late Professor Tyndall on this subject?—"Natu bodies possess the power of extinguishing, or, as it is called, absorb the light that enters them. This power of absorption is selective, hence for the most part, arise the phenomena of colour. When the li is wholly absorbed, the colour is black; a body which absorbs all equally, but not totally, is grey; whilst a body which absorbs the vari waves unequally is coloured. Colour is due to the extinction of cert constituents of white light within the body, the remaining constitue which return to the eye imparting to the body its colour. It is to borne in mind that bodies of all colours illuminated by white li reflect white light from their exterior surfaces. It is the light which plunged to a certain depth within the body, which has been sifted th by selective absorption, and then discharged from the body by inter reflections, that in general gives the body its colour."

I have stated the original source of colour is the light incident on surface of the objects. Now, to prove that—and it can be done by any who can project a spectrum—let a spectrum be projected on a wh screen, what do we see? a band of colours ranging through red, oran yellow, green, blue to violet. Now take a piece of black silk velvet a pass along the spectrum; the result is that each colour is in turn, if entirely, at least mostly obliterated, that is, the black velvet is non-reflective that it cannot reflect the colours—that is why it is bla Let us continue the experiments and use a green leaf, take that of Aspidistera australis, a large leaf of a fairly bright green. In the re looks nearly black, in the orange a dirty greyish-green, in the yello brilliant yellowish-green, in the green a vivid emerald-like green, in blue somewhat darker, in the violet almost black. Take anything li like, repeat this experiment *ad lib.*, the same, or possibly I ought to analogous, results will be obtained. This merely proves the truth Tyndall's statement.

Now, sir, if white light which is not homogeneous can be split into its constituents called the spectrum—and the spectrum is the sou of all colour—does it not seem more reasonable, less "zeitraubend," i may introduce one of the terms of my fatherland, to study the action the spectrum on the sensitive salts of silver than to make a "modera series of practical experiments" with heterogeneous light, providing, course, that the experimenter knows what he is using?

Would you, sir, would any one, even Mr. White, supposing he wan the analysis of a particular chemical, place the same in the ha of a crossing-sweeper utterly ignorant of chemistry? Would even be content to place the analysis of a complex compound the hands of a youth who has studied chemistry under the Sch Board for twelve months? Supposing Mr. White suffered from so complaint, would he go to the student at a hospital, to a chemist's a prentice, and be satisfied with the diagnosis? Yet this is what M White asks me and all the readers of the ALMANAC to do. He knows n he cannot interpret, the hieroglyphics of a photographed spectrum; a then he says, "I am Sir Oracle; when I ope my lips, let no dog bark."

A truce, sir, to these pleasantries. I have stated that I determined t spectrum sensitiveness of plates. The first was sensitive from F to H that is to say, it is sensitive to bright blue, dark blue, and violet; th being the case, I know that it is useless to employ this emulsion f photographing a pigment which reflects none of these rays—say, f instance, cadmium yellow.

The next plate is sensitive from C ¾ D to H, that is, from the orang through yellow, green, blue, to violet; is this, therefore, of much valu in photographing a pigment which, as in carmine or crimson lak reflects? Certainly not.

The third spectrum extends from B ¾ C to 6 ½ F, and from F to H It will be at once seen that there is a little gap where there is no sens tiveness, and that is in the greenish blue; at the same time, it is f more sensitive to the red than our second plate, and therefore is suitab for photographing red and red pigments.

Ducos du Hauron's statement that "the rendering of the spectru

would be limited to a reproduction of only the three primary colours, bruptly disconnected and without intermediate tints," is a most unfor- unate statement for Mr. White to quote in support of his arguments, ecause it can at once be proved to be wrong. For instance, M. du Hauron states that spectral blue is simple, and does not include a green lement capable of acting through the green screen. I do not under- tand this statement unless it be that M. du Hauron has used an inordi- nately deep green. If Mr. White doubts me when I say that spectral blue will pass through a green screen if the latter be properly made, will he, if he has mortgaged his home and bought a spectroscope, make up a green screen composed of acid green solution 1 ; 10,000, four parts; potassium bichromate 1 : 150, sixteen parts ; water, five parts, and examine the spectrum through it; or will he obtain a piece of ordinary double-flashed chromium green glass and use this? On examining the spectrum, it will be seen that not only is the D line visible, but also F, the pure spectral blue line, and if he will waste his time by photographing the spectrum, he will find with an Edwards's isochromatic, Ilford chromatic, or Lumière yellow and green sensitive plate he will obtain with sufficient exposure action extending to F $\frac{1}{2}$ G.

I must confess that I should like to see red and green screens that would totally absorb spectral yellow ; unless, of course, one made screens of the character of Landolt's filters, it is by no means easy to obtain such deep screens.

We now come to Vidal's statement, and in connexion with this we take the last paragraph of Mr. White's article. "In our own country some prominent three-colour workers recommend *the use* of a violet screen with a red-sensitive plate for producing the yellow negative. *It is clear, however, for the reason just mentioned*, that in such a negative the yellow would not be represented by the freedom from deposit that is required if anything like accuracy be aimed at. *In matters of this kind the possession of a little elementary knowledge is a decided advantage.*"

"A Daniel come to judgment! Yea, a Daniel!" Once again, sir, I agree most heartily with your contributor. His closing sentence is pregnant with wisdom ; possibly, however, the application is slightly different in our minds. He states : "Bear in mind that the yellow of the spectrum is a simple colour, and that natural yellows are, to a great extent, made up of green and red, and the solution of an apparent mystery is at once evident. The alleged action of the yellow rays is really nothing more than the action of the red element in the composite yellow." Surely Mr. White is mixing up colour and colour sensation. Does he not know that the reason why the yellow acts, when using a red-sensitive plate and a violet screen, is due to the fact that it is at present impossible to sensitise a plate for red and not for yellow, that in almost every case the sensitiveness for yellow is much greater than for red, and it is this yellow sensitiveness and the use of an improper screen that gives the deposit in the negative, and it is possible to satisfy the theoretical requirements of deposit in the red, and violet, and blue, and not in the yellow, *when you know how to do it.*

Such men as Vogel, Eder, Schumann, Waterhouse, Abney, Ives, Joly, and a host of others, all start work with the spectrum. Why? Sir, I have had sent to me from Germany this last month a newly discovered dye. I want to know whether it is of any value in colour-sensitive photography. According to Mr. White, I am to make "a moderate series of practical experiments," and I shall probably learn more than "a lifetime of unnatural experiments with the spectrum." What are practical experiments? Am I to take a coloured chart, a chromo, a landscape, or one of Reeves' or Rowney's specimen cards, an oil painting, a water-colour fabric, or what? and make a moderate series of experiments?

Supposing I take a chromo, how shall I know that the result I obtain from that is at all comparable with the results in landscape work? how do I know that the red-tiled roof, the deep-green yew tree, or the bright yellow corn is going to be reproduced correctly, even if the chromo contains a red, a green, and a yellow? How long would it take Mr. White to determine by a moderate series of practical experiments the value of his dyed emulsion for reproducing colours, as compared with ordinary and other commercial plates? Why is it that Mr. Ives states that for his kromskop and heliochromic projection the density curves must be similar to the colour-sensation curves of Young-Helmholtz, which are *spectral curves?* How long will it take Mr. White to test this new dye? I, at least, can state, after three hours with gelatine and collodion emulsions, and using the dye in various strengths, that it is a faint sensitiser for green, and much inferior to others which are well known, yet it is a sensitiser which can be used with another, and fills up a gap which is often missing; therefore, I say, with Mr. White, that, "in matters of this kind, a possession of a little elementary knowledge is a decided advantage."

A. D. Pretzl.

ON QUALITY OF TONE IN SILVER PRINTING.

That the printing quality of the negative exercises an influence in modifying the conditions under which gold is deposited in the toning bath, or, in other words, in determining the tonal quality of the finished print, is a proposition with which, at all events in its more familiar aspects, most of us who are engaged in silver printing must be familiar.

The difficulty of obtaining anything in the shape of a rich-toned print from a weak negative is, as the Correspondence column of the Journal shows, a matter of every-day occurrence. We may vary the strength of our sensitising bath as we please, and make up our toning baths according to the most approved formulæ, but still the desired result is not forthcoming.

But here, in order to guard against misconception, it is well that I should define what I precisely mean by the printing quality of a negative and by quality of tone in the print.

In the first place, I must by no means be understood to assert that a rich-toned print is necessarily, or even commonly, a print rich in contrasts of light and shade. Vigour and tonal quality are not, it is true, terms mutually opposed; but, on the other hand, neither are they, strictly speaking, interchangeable. For instance, we may safely reckon on obtaining a vigorous print from a vigorous negative. What we may not safely reckon upon is the certainty of our obtaining also that other quality, without which vigour degenerates into chalkiness.

The accurate definition of this quality is no easy matter. Some will call it tone, and refer it wholly to the colour sensations produced by the layer of deposited gold. Others, again, will define it as that justly balanced gradation of colour in which the relative intensities of light and shade are so well preserved as to approximate most nearly to the effects of nature.

Each of these definitions is true, but neither is sufficiently comprehensive. In toning operations the gold may be deposited so regularly and so abundantly as to produce a coloured surface of great beauty, and yet the print, when taken as a whole, may be adjudged unsatisfactory, simply from its lack of proper gradation. On the other hand, it is possible to produce a print which shall be satisfactory to the eye in regard to its rendering of the needful gradation, but objectionable on the score of its feeble or disagreeable colour. Accordingly, in order to get a really serviceable definition of what is meant by quality of tone, it is necessary that we combine the two imperfect definitions already given, and we shall then include under that designation both gradation of tone and colour or tone itself.

In actual practice, as most must be aware, the colour of the print is accepted as a convenient standard whereby the photographer may roughly determine the point at which the operations of toning must be arrested if a perfect print would be obtained. Clearly this point, indicated by a certain definite shade of colour in the print, is one that can be ascertained only by experience. It will, it is obvious, be liable to be affected by variations both in the strength of the sensitising bath and in the composition, strength, and age of the toning solution. But, in regard to these, also, experience must be our guide.

Thus it has come about that the silver bath of sixty grains of nitrate per ounce of water is recognised as the standard for sensitising purposes. In regard to the formula of the toning bath, there is, it is true, no such unanimity of opinion ; but the acetate of soda bath, of thirty grains acetate to each grain of chloride of gold, is so generally popular as fairly to entitle it to the same position among toning formulæ that the sixty-grain silver bath holds among formulæ of its own class.

Once these points of detail have been settled, the determination of what is the colour that indicates the properly toned print is greatly facilitated. We shall, I think, have all, or nearly all, the leading photographic authorities on our side, as well as the data of personal experience, if we fix upon purple as this colour standard. As to whether this purple should be warm or cold, a reddish purple, a bluish, or a blackish, there is apparently a considerable diversity of opinion; but, as I shall presently attempt to show, the conflicting views that are expressed on the subject can be very readily reconciled. In the mean time, let us return to the proposition with which I set out. In the case of prints upon albumenised paper, sensitised in the standard nitrate bath, and toned in the standard acetate bath, we very often fail to get the purple colour of which I have just been speaking.

With a certain class of negatives we find it impossible to get anything but shades of brown, varying from warm to cold according to the length of immersion in the gold solution. Others, again, will give us only the various shades of red, from ruddy orange or pale brick colour to deep cold crimson.

We may go on toning prints from these negatives as long as we please, but, with all our pains, we shall fail to get a batch in which this monotonous quality of tone is not strikingly apparent. Therefore the plain inference is that, under certain defined and invariable conditions as to paper, toning, &c., the tonal quality of the print varies according to the tonal quality of the negative from which it is taken.

At first sight this may seem true only in a very limited sense. It may be argued that there are other factors equally worthy of being taken into consideration, such, for instance, as the time spent in printing off, the quality of the light employed in printing, the temperature of the toning bath, the degree to which the washing of the print before and after toning has been carried, the strength of the fixing bath, and so forth. Experiment, however, clearly shows that these affect the appearance of the print rather in regard to surface and texture than in the matter of tone and gradation of effect. Did space permit, I might bring forward much interesting evidence in proof of this. As it is, my readers must needs be content with the bare assertion of an important fact.

The tone value of the negative, I repeat, then, decides that of the print, and, so much having been said by way of necessary preface, I propose to devote the remainder of this paper to tracing the various elements into which the origin of that quality is to be resolved.

Any one who has attempted to make an inquiry on these lines must have been struck by a peculiar circumstance in regard to negatives in general and dry-plate negatives in particular. It is this, that he cannot, without other aids besides mere ocular examination, infer from the appearance of a negative what will be the quality of the print that it will produce.

He may, indeed, be able to form a very accurate idea of what the positive picture will be like, so far as vigour and contrast, or the reverse, are concerned; but, beyond this, with the eye alone for guide, if he be inclined to dogmatise, he must expect to see his predictions falsified. It is, after all, not very remarkable that this should be so. I suppose we may take it for granted that the colour and gradation of the print are due to rays which have come mainly from the more refrangible end of the spectrum. If so, it is not astonishing that they should be imperceptible to us in the negative, seeing that their wave-lengths are too fine to excite the optic nerve.

All this, doubtless, tends to complicate the inquiry. It is evident that, if we are to obtain our object—that being to ascertain once and for all the conditions that are essential to the production of prints of the best quality—we must draw our conclusions from other data than from the inspection of negatives.

The data which I am about to submit are, I regret to say, far from being as full as the magnitude of the investigation demands. At the same time it must be understood that they apply to only a portion of the ground which the scope of the inquiry covers. Fragmentary as they are, they will, nevertheless, serve as a sort of nucleus around which a valuable body of facts may be amassed by future and more painstaking inquirers.

Out of several hundreds of dry-plate negatives I have selected forty for special mention. These forty possess that peculiar actinic quality of tone of which I have just been speaking, and the prints that have been taken from them are, without exception, of the richest purple hues.

In regard to subject, five of these negatives are interiors, and the remainder landscapes. The thirty-five may, in their turn, be divided into landscapes pure and simple, and architectural exteriors. Of the former there are twenty-three, and of the latter twelve.

In the exteriors there is, for the most part, little but middle distance and foreground. In the pure landscapes, on the other hand, we get distance, middle distance, and foreground. In the latter, clouds and atmospheric effects play a prominent part.

As to plates, three different varieties by as many makers were employed, viz., the Ilford Ordinary, the Kingston Special, and Edwards's Special Instantaneous. Dividing these into rapid and medium to slow, I find that twenty-four negatives of the series were taken upon the former, and sixteen upon the latter.

Next, as bearing upon the important point of the influence exercised by the sun's rays at different seasons of the year, I may state that two plates of the series were exposed in the month of April, four in May, six in June, five in July, nine in August, eleven in September, and three in October.

The forty exposures were made between the hours of 8 a.m. and 6 p.m. Between 8 a.m. and 10 a.m. only one plate was exposed; between 10 a.m. and 11 a.m., two plates; 11 a.m. and 12 noon, four plates; 12 noon and 1 p.m., four plates; 1 p.m. and 2 p.m., twelve plates; 2 p.m. and 3 p.m., five plates; 3 p.m. and 4 p.m., six plates; 4 p.m. and 5 p.m., four plates; and 5 p.m. and 6 p.m., two plates.

The quality of the light next claims attention.

Classified under the the three heads, "bright," "medium," and "dull," thirty-two negatives are to be placed in the first category, six in the second, and two in the third. I may mention in passing that, under "bright" light, the negatives taken in sunshine and those taken in bright diffused light are alike included.

The sun was behind the camera in twenty-one cases. In the remaining nineteen it formed a more or less acute angle with the plane of the picture.

In the outdoor exposures a wide-angle landscape lens, with an aperture of *f*-12, was employed. For the interiors, the aperture was reduced to *f*-32.

The exposures given to the outdoor members of the series varied from one-fifth of a second to two seconds. The average exposure was something approaching half a second.

In the case of the interiors the exposures varied from three to four minutes.

Next, as to the development. In every case pyrogallol and ammonia were used for developing, potassium bromide being added as a restrainer.

The strength of the developer was varied occasionally to suit the exposure given; but, in general, the constituents were present in these proportions:—

Pyro	2 grains.
Bromide	1 grain.
Ammonia	2·6 minims.

In sixteen cases the duration of the development ranged from one minute to seven minutes, the average being exactly five minutes. In seventeen cases it ranged from eight minutes to fourteen, with an average of ten and a half minutes. In seven case the range was from fifteen minutes to twenty-two, with an average period of nineteen minutes.

The following were the results, as shown by the negatives after development:—

	Negatives.
Under exposed and under-developed	2
Under-exposed and correctly developed	5
Under-exposed and over-developed	2
Correctly exposed and under-developed	2
Correctly exposed and correctly developed	7
Correctly exposed and over-developed	10
Over-exposed and under-developed	0
Over-exposed and correctly developed	10
Over-exposed and over-developed	2

N.B.—In all cases the excess or deficiency in exposure was of a slight character.

From first to last the operations of printing and toning were carried out in such a manner as to secure for the prints uniformity of treatment; whilst, with the object of getting as rich tones as possible, ample time was allowed for the gold surface to deposit itself.

As to the appearance of the prints, I have already made reference.

I ought, however, to add that nine of the negatives gave me prints of a somewhat finer quality than the rest. Of these, one had been under-exposed and correctly developed; two correctly exposed and correctly developed; two correctly exposed and over-developed; three over-exposed and correctly developed, and one over-exposed and over-developed.

The average duration of the development in the case of these nine was nine minutes, with a range of from four to fourteen minutes.

Having now marshalled the different data in their proper order, I shall attempt to draw a few inferences, wherein I trust to throw some little light on the conditions under which the perfect print is produced.

There are, it would seem, seven factors that must be taken into consideration.

These are: The character of the subject, the rapidity of the plate, the season of the year, the time of day, the quality of the light, the duration of the exposure, and the nature of the development.

With reference to the first of these, it is clear enough that landscape subjects, and those in particular in which the reflected light of the sky predominates, give better pictures than do subjects of a more restricted range. Seeing that over 57 per cent. of the negatives that we are considering are landscapes, the conclusion is reasonably strong.

Passing from the subject to the plates, the figures show that, other things being equal, a rapid plate is preferable to a slow one in twenty-four cases out of forty, or 60 per cent. of the whole.

The season of the year comes next. Curiously enough, the best prints

hose from negatives, taken, not, as we might expect, in the summer hs, when the sun's light is most intense, but in autumn, when it egun to decline.

ptember leads, with 27·5 per cent.; August comes next, with 22·5; follows June, with 15; July, with 12·5; May, with 10; October, 7·5; and, lastly, April, with 5 per cent.

cording to Roscoe and others, the actinic force of the sun's rays is est in July, but it will be observed that month stands fourth in the

regard to the influence due to the hourly variation in the strength ie light, it appears that 30 per cent. of the negatives were taken een one and two p.m. This is the maximum figure. Next in import. come the two hours immediately following. These, however, give us 12·5 and 15 per cent.—a considerable falling off.

actically, the maximum represents the greatest diurnal intensity pt in the case of the three October negatives.

he fluctuations which affect the average hourly value of the light require notice.

ere there is little room for doubt that bright light, though not ssarily sunshine, is essential to the production of the right class of ative. This conclusion is supported by no less than 80 per cent. of negatives of the series.

he developer and the exposure may be considered together.

[ere we are confronted by another curious fact. This is, that a ectly exposed and developed negative does not give so good a print in majority of cases as one in which the duration either of exposure or de- pment has been a little in excess of what was necessary. Of correctly osed, but over-developed, negatives there are 25 per cent., and the ie percentage of negatives over-exposed but correctly developed. Of correctly exposed and correctly developed there are 17·5 per cent.; the under-exposed and correctly developed, 12·5 per cent.; and, of the other possible combinations, 5 per cent. each, except of the over- osed and under-developed, which is not represented.

We may, then, fairly conclude that it is desirable to prolong the de- opment in cases of correct exposure, and to keep it normal when the per exposure has been slightly exceeded.

The data also warrant us concluding that, though it must be regulated suit the exposure, the development should not be of longer duration an the requirements of the case demand.

I am sorry that I have been unable to treat this interesting subject in its details. The investigation might, it is evident, be vastly extended. ie different forms of developers would claim a large share of attention, also the many varieties of new printing papers, and the variously com- unded toning solutions.

The importance of the colour of the negative in particular, as a de- rmining factor, can hardly be over-rated. Here is an illustration, hich is only one out of many that might be adduced.

If we take up any of the older photographic text-books, we shall find e colour of the properly toned print described therein as a cold purple proaching to black. In modern works, notwithstanding, we find it lled a warm purple, and sometimes, but inaccurately, even a rich own.

The discrepancy, odd as it may appear to the uninitiated, is easily xplained. It is mainly attributable to the difference in the quality of the vo negatives from which the respective prints are assumed to have been ken, and this difference, in its turn, must be referred to the use, in the ie case, of a wet-plate developer, and of a dry-plate developer in the her..

MATTHEW WILSON.

IS PHOTOGRAPHY AMONG THE FINE ARTS?

THE above is the title of an article by Mr. Joseph Pennell that appears n the December number of the *Contemporary Review*. He answers his wn question in the negative, and his reasons may be grasped by a erusal of the following extracts from his article:—

"When artist photographers have been compared in a flippant strain artist tailors, and artist barbers, and music-hall artists, they have requently shown a degree of temper which a man, morally conscious f right, would think superfluous. They have insisted the more angrily hat they are artists; they have talked the louder about artistic photo- raphy and its place among the fine arts. Fortunately, as I write, here is a chance to study them, not merely by their words, but by heir works, for two photographic Exhibitions are open in London. The visitor to these two Exhibitions will quickly discover that their ims are very different, though the difference in actual results obtained s not so marked. The members of the Royal Photographic Society vidently have for their object the recording of the year's progress in photography. It is true that what they call the art section has been judged by artists, while the technical section has been judged by photographers. It might be pointed out that, if photography is an art, and its practitioners artists, they should be quite as capable as humble Associates of the Royal Academy of Arts to decide upon the merit of their own work; artists, as a rule, do not submit their productions to the makers of frames and the manufacturer of colours. At the Photographic Salon, on the other hand, we are informed that, 'released from mechanical trammels, photography is capable of dealing with the subtleties of pictorial effect; that it may aim at a high expression of decorative value;' that its practitioners are not precluded from the power of exercising their fancy and imagination; and that photographers themselves should be capable of fixing a standard of merit of their own pictorial work without appealing for assistance to experts in other arts. Thus it seems that photographers, before they have established their position, have begun to disagree among themselves as to what it is. The members of the Royal Society frankly appeal to artists for artistic judgment; the members of the Photographic Salon declare there is no necessity to call in experts, though that they really do desire criticism other than their own is evident, as they continue to send tickets to the Press. I think, on the whole, the Royal Photographic Society, while it does not pretend to be essentially an artistic body, is more consistent to traditions heretofore accepted as artistic than the Photographic Salon, despite its Franco-British name. If, upon technical matters, an architect does not consult a painter, nor the illustrator refer to the sculptor, yet all artists have always worked harmoniously together for a common end, the advancement of their profession. But this is a side issue. The one important question is, Whether the photographers, by the prints shown, justify their claim to the rank of artists. I only note, in passing, that artists have not insisted upon their right to be called artists on every appropriate and inappropriate occasion. The fact that they are artists has been recognised since the earliest ages, and any form of expression they may evolve is gladly accepted if it is artistic; the greater the artist, the more diffident he feels about his position in the world of art."

This is what, according to Mr. Pennell, formerly went to the making of an artist:—

"As a rule, he lived so much in his own world that he scarcely knew what was happening about him, and the world knew still less of him. He was so absorbed in his own affairs that little else interested or appealed to him. He usually entered his profession at a very early age. He began as an apprentice. He learned to wash his master's brushes, to clean and set his master's palette. He mixed the clay or he fired the furnace. When he had learned to do these things—the elements of his trade, at which he was kept for some years—he was allowed to draw, and for more years he studied; he copied in line, nature, or art. Then he was permitted to work, exactly in the manner of his master, on the least important part of his master's paintings, and, after ten or fifteen years of this sort of practice or preparation, when he had learned to judge pictures critically, because he knew how they were made, when he was able to make them, because critically, and scientifically, and technically, he understood his craft, he left his master and started for himself. In nine cases out of ten, after years of struggling, he discovered that he was quite incapable of doing as good work as that produced in the workshop which he had left. If he had something to say for himself, he said it in a slightly different way from his master; and, if he said it better, or even as well, he took equal rank with him in the course of years, sometimes sooner, sometimes later. If he were possessed of what we call genius—that is, the capacity for tremendously hard work—he might become known after a shorter apprenticeship. But the chances were, and still are, that throughout his life he would remain unrecognised, that no one would ever hear of him until his death. He probably believed that he was doing his work as he should do it, and it was never his business to be avowedly revolutionary, except in the sense that the Van Eycks, or whoever introduced the use of oils in painting, were revolutionary, or Dürer when he perfected wood-cutting, or Bewick when he developed wood-engraving, or Senefelder when he discovered lithography; nor was it the artist's mission to live down the opposition of the unintelligent multitude. When old age came upon him, he craved for more years, that he might work and solve those new problems that were continually presenting themselves to him as he grew in knowledge and handicraft; and, dying, he might murmur the names of some of the great ones in the world's history, and say, 'I, too, am an artist!' In a word, to be worthy of the name of artist, it has always been held necessary to give to art one's whole life, one's whole thought, and, above all, one's entire technical and mechanical skill, only to be acquired by unending study and practice . . . .

"What is the training of the photographer who is noisiest in his assertion that he is an artist? Does he devote his whole life, or a year, or a month, to the study of art? Does he give up his whole life to the study and the practice even of photography? Is photography his profession, his occupation, his sole concern and interest? Is he first the apprentice, then the master, in the shop, the useless room with no window, or studio, as he prefers to call it? I look down the list of exhibitors at the Photographic Salon, where the gospel of art is most strenuously preached; I see among them the names of parsons, of Government clerks, of solicitors, of a beef-extract maker, of a banker,

and some titles—in fact, the amateur rampant. It is the time left over from his serious work in life that this photographer gives to his 'art.' Photography is his amusement, his relaxation. He labours in his pulpit or at his desk all the week, and then, when the half-holiday comes, he seizes his little black box, skips nimbly to the top of a 'bus, hurries from his Hampstead heights to the Embankment, plants his machine in a convenient corner, and, with the pressing of a button or the loosing of a cap, creates for you a nocturne which shall rank with the life work of the master; or, at odd moments, in his wilds of Clapham, he will evolve the scheme of a poster that shall humble Chéret into the dust; or, getting a model to pose stark naked for him, he will prosent you an idyl out of the same little box that should put—and it does—Botticelli to shame. He sees what he likes, for he has been taught what to like by reading books upon painting, which he does not understand, and which teach nothing for him; he prepares his camera; he focusses it, or knocks it out of focus; he puts in his glass plate or his film. And who does the work? who makes the picture? Why, he does not as much as know whether there is a picture on it until he brings the plate or film home and develops it. What does the painter do? He either sits down in front of his subject—a landscape, let us suppose—makes a careful study of it with his unaided hands, which he is able to do because he has had a certain training, and has the power to do it—a power in which the photographer is totally deficient; or he looks at it, and his observation and his memory are so keen that he can absorb the whole character of the scene before him, and then later reproduce it out of his box—his brain—without, perhaps, doing a scrap of work on the spot. . . ."

"In a word, the photographer is the bold independent who has broken loose from tradition and asserted his individuality, not by the cultivation of his hand, and his brain, and his eye, that these three unruly members may work together to produce the harmony the artist almost despairs of; no, but by sticking his head in a black box, and at the crucial moment letting a machine do everything for him. It is the chemistry he despises, the optics he is superior to, the science he scoffs at which do the whole thing. I have heard of one artist who, like the photographer, hands over his task to an agent—the Emperor of Germany. He too, with no trouble to himself, through his faithful Knackfuss, may produce masterpieces; and they are more amusing than photographs because, in this case, the agent is human, not mechanical. When the photographer touches his great works with his hands, they cease to be photographs. The most skilful painter is a bungler, who takes months to put a figure on his canvas; a photographer's machine will put it on the same canvas while you wait. And the art? Why, with his machinery and his chemicals, he can put upon canvas, upon paper, upon metal, pictures which look to himself and his friends surprisingly like the real thing. The man who sells margarine for butter, and chalk and water for milk, does much the same, and renders himself liable to legal prosecution by doing it. The art of the photographer, as now explained, is to make his photographs as much like something that they are not as he can. The old-fashioned idea was to give a straightforward photograph, as direct, and clear, and true as possible, a photograph that was of some use as a record. The revolutionary photograph is one that bears upon the surface a vague resemblance to a poor photograph of a charcoal, a sepia, or a wash drawing, to an aquatint or a water colour. I never heard of a great painter who endeavoured to palm off his paintings as chromos. The photographer plays with his print, until it is neither the photograph it ought to be, nor the drawing he would like it to be. But his one ambition is to have you forget that his photograph is a photograph. Thus, you read in a sympathetic criticism that a certain print is 'a graceful design for a fan in red chalk,' when it is nothing but some sort of a faked-up print in red, which looks as much like chalk as that useful commodity does like cheese. All the old critical jargon, long since discarded by even the oldest of the old critics, is brought into service in photographic discussions and notices to strengthen the deception, and the newest of new technical terms into the bargain, to the infinite confusion of the humble inquirer. From one writer, encouraged by the *Times* to the extent of a column and a quarter, I learn that a photographer may employ a method of printing which 'allows of an amount of modification, from absolute obliteration to varying degrees of half-tone and shadow;' but I wonder if anybody will tell me what a half-tone is, except, of course, as the term is employed by the mechanical engraver; the critic does not condescend to explain, but adds that the system is one 'of which only the most skilful—and they must be true artists also—can avail themselves successfully.' They must also, it appears, be possessed of 'striking originality and unrivalled artistic feeling,' though that they should know anything of drawing and painting does not seem necessary. But they must be '*chic*' to a degree! It is not astonishing to find that the print which inspired this delightfully inappropriate medley of applause should deal with a subject that is confessed to be '*franchement canaille*.' Again, I read that a certain photograph of 'Molly' 'is a piece of decoration for which the beautiful and harmonious frame is somewhat responsible;' were it not also described as an 'impression' I would suggest that the frame might have been sent alone. Even the poor tortured term 'impression,' you see, must be dragged in. . . ."

"Unless a man can draw with his own unaided hand, he is not an artist, he never has been considered one, and he never will be. To fake up photographic prints so that they shall look like drawings or paintings is a sham which one would think any person who pretended to call himself an artist would be ashamed to descend to. It is a harmless amusement to make photographs, but to publish them as works of art is more serious, because it helps to lower the standard, already too low, for the great ignorant, artless public. This is the one grievance artists have against photographers: they cheapen and degrade everything, even their own often excellent work, when they insist that they themselves are artists, and that their snap-shots, printed on stained papers, faked and fiddled, are works of art. They might to their profit remember that the best work in photo engraving, the one photographic contrivance that comes in direct connexion with art, is done by men who were first artists, and then afterwards turned to photography. If some day artists devote themselves seriously to making snap-shop "pictures," the photographic amateur will have a bad time of it. Even photographers admit that the artist who has been trained knows best what to do with the camera. It stands to reason that the man who talks loudly about tones and values without the ability to render them with his own hands will run a poor chance against the man who spends his life studying and trying to record these most evanescent and elusive phenomena of nature. However, just as margarine has never superseded butter, or chalk and water milk, or been put in equal rank with it, so photography, even at its best and in the hands of artists, will never destroy art, will never be considered one of the fine arts."

SHARP *VERSUS* FUZZY PHOTOGRAPHS.

[Croydon Microscopical and Natural History Club, Photographic Section.]

Discussion on Sharp *versus* Fuzzy Photographs, Friday, December 17. For, Mr. J. H. Baldock, F.C.S.; against, Mr. C. Moss.

Mr. Baldock:

Mr. Baldock said he thought, for the purposes of this discussion, it was necessary to arrive at as correct a meaning as possible of the three words, art, picture, and photography. Taking art first, it is something in which the mind or imagination takes part, something evolved from the brain, a conscious cerebration; hence painting, poetry, and music came under this definition. Picture means, literally, something painted, although every kind of drawing, whether in pencil, crayon, or India ink, may not inappropriately be called a picture. "Taking these two words, art and picture, together, then, I should say that a picture is a work of art, being something produced by the mind or imagination of its producer, *i.e.*, an artist. Photography is very easily defined from its Greek derivatives, *i.e.*, φωτός, light, and γράφειν, to write, that is, something written or impressed by the action of light. It is correct, therefore, to describe a picture as having been produced by means of photography, but art, strictly speaking, does not come in at all, and I contend that photography, pure and simple, is not, and cannot in the nature of things be, an art. Of course, my opponent will say I am wrong, and that you may have a very beautiful photograph, which you may call a work of art, and, *in a sense*, he may be right; but, in reply to that, I should say that, if you take a photograph, and so alter it, either by retouching, double printing, or any of the well-known 'faking' processes, then, the nearer you bring it to being a work of art, the farther you remove it from being a photograph. Why? Because you have brought your mind and imagination to bear upon it, and impressed your own individuality upon it. To that extent, and to that only, can a photograph have any pretensions to be called a work of art.

"Having thus attempted to define what a photograph is, I pass to the more immediate subject of the discussion, and shall endeavour to prove that a photograph ought to be sharp. This proposition was hardly disputed till lately, when a new school, happily few in number, seems to have sprung into existence, whose object appears to be to endeavour to carry out an utter impossibility, *i.e.*, to make a photograph rival a painting, and for this purpose they produce what has been called a fuzzygraph, the exact meaning of which is, however, not very clear. Those who read my article in The British Journal of Photography for November 26 will remember that I concluded it by saying that it would be as reasonable to expect any one to recognise some of the most lovely scenes in nature by means of a fuzzygraph as it would be to recognise a Beethoven's sonata, if played on a piano every note of which was out of tune. It is not singular, therefore, that I found, in a letter from a friend, himself no mean judge of art, the following: 'Fuzziness is, I suppose, a subject on which most persons can form an opinion, but I doubt their opinions being much altered by all that has been, or can be, written on the subject. Fuzziness, I take it, is one of the attempts to make a photographic picture rival a hand-painted picture. As well might a player on the barrel-organ try to emulate a Paganini on his violin!'

"I think I am entitled to ask, Why should the *representation* of a landscape, say, by photography, be more blurred, and less distinct in all its parts, than the actual landscape itself would be if looked at with the eyes? why are photographic lenses being produced the very object of which is to produce a sharp picture? Why are pictures thrown on to a screen so irritating to an audience unless they are sharp, and why have we all, for so many years, been admiring the exquisite works of art produced by the engraver on his steel and copper plates? My opponent might say, Well, how about Turner? his glorious paintings are not sharp! True, but, then, he employed colour, and could make the most of

iaroscuro. Suppose, however, if Turner's paintings were photographed, if the engraver tried (in vain) to reproduce them as engravings, not they have been reproduced, but with all the (what shall I call it) out-focus effects of them. What then, I ask, should we think of such work as is, reduced as they would be to mere black-and-white studies, without race of the mind of the man who originally created them? no one, I l sure, would even give them a moment's attention.

"Those who advocate fuzziness appear to me as though they felt themves on slippery ice, or in a somewhat false position, and they try to ve themselves by talking about 'pictorial photography' and 'scientific otography,' and saying that, while the first *may* be fuzzy, the second ust be sharp; but upon what authority they make this distinction I do t know. Certain it is that what they term scientific photography *must sharp*, otherwise it possesses no value whatever; so upon this point we n afford to shake hands. But why should pictorial photography be zzy? Why, in fact, should the photograph convey so much less to r sense of vision than the real, natural view does? When we look at a autiful landscape; when we view the sea with a number of ships in ht; when we look along a coast-line and see boats on shore, or, maybe, wreck; when we regard a field, in which horses, cattle, or sheep are azing; when we walk in the country, and see the spire of the village urch peeping up among the trees; why, why, I ask, should we be ked to accept an apology for all these things, every one of which we n see clearly and well defined when we have to look at them in a pic-re? Surely the reverse of this is what is wanted, for, if the eye can nge over miles of scenery, and see all but the most distant parts of it arly, telling at a glance what the animals in the field are, what the es in the wood are, what the ships at sea are, then, when these things e compressed into the few inches which we call a pictorial photograph, becomes all the more necessary that they should be sharply defined, id the smaller the picture the sharper they should be, being all in one ane and so easily traversed by the eye.

"Regarding 'fuzzygraphs,' a gentleman just lately said to an artist, o was criticising them adversely, 'Oh, but you must not look at em so closely; they are intended to be viewed from a distance.' 'In at case,' replied the artist, 'you would see nothing at all.' It is mewhat unfortunate that a process, claiming to be a photographic pro-ss, has just lately been resuscitated, and proclaimed with a flourish of umpets, which more than any other process produces 'fuzzygraphs.' refer, of course, to the bichromated gum process, which really has very tle connexion with photography. This procees, which runs very closely ong the lines of the carbon process, differing indeed in only two points, ., that gum is used in place of gelatine (both being colloids), and cold ater instead of hot is responsible, so far as it has gone at present, for me of the most horrible monstrosities that have ever been palmed off photographs. Portraits done by its means look dirty and spotty, as ough they wanted a good dose of Pears', or even Monkey-brand, soap; nereas pictures present one with a number of objects utterly defying entification. One can only wonder what such men as Leighton, Land-er, Cooper, Luke Fildes, &c., would say if some of the so-called otographic productions of the present day were shown to them; and eir astonishment could, I should think, hardly be even imagined when ey were told that these productions were called works of art! Truly ight they say, If this be art, then has all our time been wasted and our bour in vain.

"This criticism may be thought severe, but it is mild compared to what Cosmos' says of Fuzzygraphs in THE BRITISH JOURNAL OF PHOTO-APHY for December 10, 1897, on page 789, but I feel bound in justice to r. Packham and the specimens of the bichromated gum process he showed his demonstration at the Photographic Club, to say that better results n be obtained by this process than anything which had been exhibited to that time; but, referring to what I have previously said respecting otography and art, it certainly seems to me that Mr. Packham gives e whole show away in the remarks he made at the conclusion of his per; he said 'We may now assume you have something that may be mewhat like a picture, and now comes the time for those final opera-ns which we are told are questionable photography.' Exactly, and this int may be stated to be, as far as this process is concerned at any rate, at at which photography ends and a mild form of art begins. In the rrent issue of THE BRITISH JOURNAL there is a letter under the signature orkshireman,' and it is a pity he has not the courage of his opinions d sign his real name, in which the writer, after condemning dogmatic inions, pens a letter which is the very essence of dogmatism, the whole rden of which is to try and show (not prove) that photography is art, and at fuzzyism is the individual soul of the (so-called) art photographer.

"Let me conclude this rather long and rambling dissertation by stating at, in my opinion, no photograph should be entirely out of focus, that *all* photographs should be absolutely sharp, and that any diffusion of us is only permissible in large work, where it is necessary to stand at ne distance from the picture in order to gain an impression of its *neral* effect; and even then it is rather a softening off of the distance, means of light and shade, than a true diffusion of focus. How many ople, when viewing objects in nature, or pictures in a gallery, obtain st a general impression, and then go nearer to study the details; but a fuzzigraph it would be useless to go nearer to it, because there are details to see. I regard a well-executed engraving as the nearest thing photograph can approach to, both being (if platinum or bromide) studies in black-and-white, emphasis and distance being brought about by a judicious distribution of light and shade. You will find in this plenty of scope for 'science' and 'skill' if you like, but not art properly so called, and you will be able thus to translate some of the most beautiful scenes in nature into equally beautiful photographs, of which you may be proud, and which shall give delight to your friends, and be things of beauty, of joy, for ever."

MR. MOSS:

"I find myself in a somewhat embarrassing position, inasmuch as I have been handed a brief for the defence, and I do not feel able to give 'fuzzyism,' as I understand it, my unqualified support. I would no more assert that all photographs should be out of focus than I would say the lens should always be stopped down to *f* 64; each method has its use and advantages, and we must, in considering the treatment of a subject, decide upon the impression we wish to give, or the message we wish to convey, through the medium of our picture.

"In defending diffusion of focus (it is a nicer term than 'fuzzyism'), I must necessarily deal with pictorial photography, for in all other branches of photography sharpness, I take it, is a *sine-quâ-non*. If photographs are taken as reminiscences, say, of our summer holidays, by all means stop down your lens—you can the better recognise objects which will remind you of happy hours. Photographs, too, of objects of interest may be as sharp as lens can make them, for has not the photograph been taken for the sake of the objects themselves, and that we may in detail describe them to our friends?

"But how is it with pictorial photography, which deals with the portrayal of objects, not for *themselves*, but rather as *parts* of the picture, and, as Euclid tells us the whole is greater than a part, so should the picture, *as a whole*, appeal to us, and not the component parts of it? It is frequently said that, as all the wonderful details we see in Nature are the work of that Great Artist Who made the world, we cannot do better than endeavour to reproduce them all as faithfully and as exactly as we can. But what do we see in Nature? I doubt if she impresses any two of us in exactly the same way, and our aim should be to give to others by our photographs the impressions which our mind has received This does not necessarily mean that our photograph should represent Nature exactly as the eye saw her, for the *eye* may receive many of the minor, unimportant details, while the impression left on the *mind* is that of the greater truths, and it is this impression which the photograph should suggest. If we let our camera and lens have their own sweet way, they will ignore the suggestion of these greater truths, and give us only all those lesser facts which have well been described as 'harrowing details.'

Perhaps I can make my meaning clearer if I ask you to come with me in imagination, say, to London Bridge, and look down on the busy, smoky river, which has ever ebbed and flowed heedless of the hand of man—stronger than he, yet serving him. What do we see? What is the story the river tells us as we stand above it? Have you an overwhelming wish to read the letters painted on the bows of this sturdy little tug which is forcing its way against the stream, bringing in its wake its load of barges filled with merchandise? Look at those river porters, who, like bees around their hive, are unloading that coasting steamer lying at the wharf. Are you particularly interested in the loads they are carrying away, or is all your attention centered in the details of that barge which the mighty river is helping to its journey's end? I think the scene has something more, something better than this to tell us—a story of bustle, of strife, of never-resting, never-ending activity. From sunrise to sunset men are struggling, labouring, toiling, and the river steadily ebbs and flows. It is the *whole* which impresses us, and *not* the *parts*. Let us photograph it, and let us endeavour to make our picture give to others the message the river has given us. Shall we call attention to all those petty details we did not see, and did not want to see? No, rather let us hide them, soften them, so that in the photograph they shall not claim attention; let us make our lens do our bidding, and give us only what impressed us.

"Once more let us imagine we are in the meadows on a bright and sunny day in June, listening to the murmurs of that little brook which has trickled from the distant hills; the music of the birds, and the incense of the flowers bring to us a message and tell that summer is here, and every living thing is glad. What a picture this is before us! How well this little brook, running through the reeds and grasses in the foreground, leads the eye up to that mass of dark, a clump of trees, midst which the shepherd's cottage nestles. Let us set up our camera and ask ourselves what it is that appeals to us in the scene before us. Do we want to microscopically examine the grasses in the foreground, or do we care whether the cottage is built with bricks or stone, or whether those trees are oaks or elms? Surely there is something better than all this to tell. Let us tell it, and ignore all those little details, which marvellous as they may be in themselves, have nothing to do with the impression we wish to give. Let us suppress them, subdue them, and by our photograph suggest only the sunshine, the peace, and the gladness tha filled our hearts.

"It has been stated that, if we look at any scene in Nature, we can focus our eyes on any one object, and, if sufficiently close to that object, can examine minutely every detail. Why, then, not photograph so that, in the resulting print, we can see all those details which certainly existed in

the original? My answer is that our aim should be not to *reproduce*, but to *translate*, and our camera and chemicals, if we follow the text-books, are only capable of *reproducing;* it is the *man* who must translate, and the man must use his apparatus as a means to express his thoughts and feelings. If he focus sharply and get biting definition in all parts of his photograph, the *eye* may be pleased at the way in which every leaf, and twig, and blade of grass are reproduced, but such exact reproduction can bring no pleasure to the *mind* or the imagination.

"It may be, and is, argued that the camera is a machine, and therefore cannot give anything but mechanical results, and, conseqently, photography is doomed to stand for ever outside that circle of art to which painting and drawing are admitted. I freely acknowledge that photography has its limitations, and it is possible those limitations *may* prevent it from ever taking a position amongst the higher arts; but I do most emphatically state that it is possible for a man to a great extent to express himself through the medium of photography, and, as year by year we get more and more power over our tools, so do we surely win for photography a higher, nobler place among the graphic arts. But this cannot possibly be achieved unless we control our tools, instead of being controlled by them, and I would beg of you who are interested in pictorial photography to throw your text-books to the winds, forget all about 'perfect' negatives and 'perfect' prints; go to Nature, see her for yourself, then, having thrown away all your old standards of photographic excellence, give us in your photographs your impressions of nature as you saw her."

Messrs. Packham, Straker, Russell, Baker, Platts, Wild, Crowley, Coldwells, and Roads took part in the discussion, and the general opinion seemed to be that, while a slight diffusion of focus was in some cases allowable and even advantageous, fuzziness, as expounded by some of its supporters, was not desirable.

A very pleasant and instructive discussion characterised the meeting.

COMBINATION LIGHTING.

II.

In a previous article I referred to the advantages obtained by using one or other of the several methods of artificial lighting in conjunction with the poor quality of daylight met with at this season of the year. A few of the particular class of subjects that are most amenable to such treatment may be mentioned. At that season of the year, when almost every church and cathedral throughout the length and breadth of the land has been, holding its Harvest Thanksgiving, and when such edifices are specially decorated for the occasion, a photographer has no great limit of time to wait for the most suitable conditions of natural lighting when called upon to accomplish such a class of work, not to speak of the almost certain difficulties attendant upon false lights from obstructing windows, either stained or unstained—a combination of circumstances at once trying in the extreme; and, when to such is added the non-actinic value of the dark green and brown foliage so largely *en évidence* in decorations of this description, it will be at once apparent that almost insurmountable difficulties exist in the way of accomplishing such subjects by ordinary daylight.

I mention this class of interior working as a case in point that is particularly amenable to the kind of lighting we are considering; in fact, several of such instances have quite recently come to hand for the writer to photograph, and, had it not been for the assistance that artificial light rendered in one or two cases, failure would certainly have ensued.

In one instance I was called in to photograph a most elaborately decorated church, the pulpit and portion of which it was especially desired to show in the picture. Immediately behind the pulpit, facing right into the lens, was a large unstained-glass window, through which, at the time fixed upon for taking the picture, the sun was shining with all its strength. In front was a large bank of dark green foliaged plants, the foreground of which was thrown by the light from the direct window into dense shadow, affording, perhaps, one of the most difficult subjects imaginable for the camera.

I saw at a glance that a fully timed daylight exposure on this subject was quite out of the question, for no plate could have stood in the direct rays of sunlight, that streamed directly into the church in front of the lens, without being hopelessly ruined with such direct light.

No doubt, Sandell plates are a great advance when dealing with subjects such as interiors, where obstructing windows have to be dealt with, and, when such are judiciously employed, most excellent results are obtained, and I have quite recently been enabled to accomplish, in our grand old cathedral in Glasgow, much work with their aid that would have been considered almost impossible some years ago.

I have never yet, however, come across a plate that would stand exposing for a full half hour in front of a directly sunlighted window without being hopelessly clogged up with halation.

In the circumstances I am considering, a Sandell plate was employed, after the blinds of the windows (some of which were of white cotton) had been run down to exclude as much light as possible from the front. The plate was exposed to the existing daylight for a very few seconds of time only; the lens was then capped, and arrangements made for a good flood of artificial light from a powerful magnesium flame of several seconds' duration.

The disposition of this light was, of course, carefully studied previously, so as to throw up the desired foreground. In the flashes that were given as much as a quarter of an ounce of magnesium powder would be consumed in the burning pan about twelve inches long, charged with cotton-wool saturated with methylated spirits. This, as may be imagined, gave an immense light, which lasted for several seconds of time, and this could be prolonged as long as was desired by the operator projecting the powder into the flame by means of the blowpipe. This yielded a light that illuminated the whole of the entire surroundings in the most perfect manner, and yielded a fine printing negative that could never have been obtained by daylight.

Such is, at least, one of the many subjects wherein combination lighting proves so useful. I say nothing of smoke.

I have also found an almost identically similar method of working of the greatest assistance when photographing stained-glass windows that were situated up against the light, and where the interior surroundings of the windows were desired to appear prominently in the photograph. A Sandell plate exposed briefly, or for the required necessary time to bring up the transparency values of the windows, and then subjected to an interior lighting from one or other of the many methods I am considering, will yield the most exquisite results.

Of course, as previously stated, the great drawback to the employment of magnesium lies in the abominable amount of smoke that is given off when burned in any quantity; and therefore there are many positions and circumstances that prevent it being employed.

Quite recently, I have met with instances where the use of large paraffin lamps in conjunction with daylight has proved most beneficial. The class of subjects that these lamps become of service in are wall fixtures and capitals and bosses in architectural working. The great advantage in their employment lies in the ease of distributing them into such positions as throw the light upon the object from the exact point desired.

Of course, very much longer exposures are necessary when lamps are used, much more so than many imagine, if the lighting has been carefully studied, and good shadows and bold high lights provided when placing the lamps in their positions. Plenty of exposure may be given, and extremely fine negatives obtained.

Paraffin lamps are most useful, simply because they are so portable, and yield a very powerful light without smoke.

Acetylene gas, although in its infancy, is another highly useful form of artificial lighting; and although the employment of such entails at times, in outside situations, considerably more trouble in adjusting, still there are special subjects and circumstances where such increased trouble is well repayed.

The selection of the most suitable method to employ is a matter of considerable importance, and should be well thought out before attempting work of this description.

At the present moment I have a subject on hand that has baffled not a few who have attempted to photograph it. I mean to have a good hard try, however, with nothing less than a powerful search light, and perhaps, at some early date, I may have a little information to lay before the readers of The British Journal of Photography anent this somewhat novel subject.

No reference has hitherto been made to the employment of slow-combustion powder; such at times is quite as useful as the magnesium light, in my experience more so, especially in situations such as outside places where the deleterious fumes are easily got rid of in the open air; such, however, must be used with caution in confined situations, where ventilation is defective.

The advantage of using these slow-burning powders lies in the fact that the eye has time to grasp the full effect of the lighting upon the subject, so that supplementary flashes may be applied to any part or portion that appeared inadequately lighted. With rapid flash lighting it is at times difficult to see exactly the true effect on the subjects until the plate has been developed.

T. N. Armstrong.

SCHWARZ'S PROCESS AND MEANS FOR FEEDING EXPOSED PHOTOGRAPHIC PAPER STRIPS THROUGH A NUMBER OF BATHS.

In the manufacture of photographs on a large scale, the exposed paper strips are fed by a mechanical means through the various baths in order to develop, tone, and fix the photographic images.

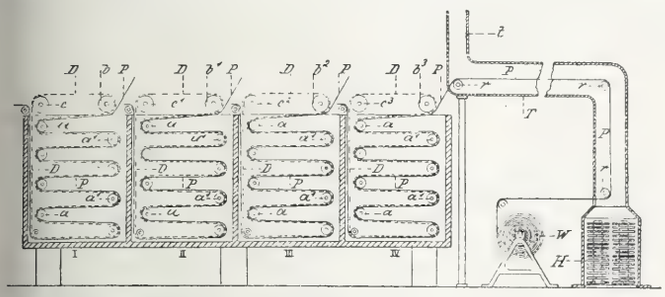
The greater the production, the larger must obviously be the baths and as in the treatment of such paper in overhanging tracks, such as has been hitherto practised, a certain depth of bath could not be exceeded on practical grounds, the number of baths had to be increased, and such arrangement required a large space, which is not always available.

A further defect arises from the feeding of the paper strip through the baths by means of one continuous travelling band or web, whereby the paper, as it passed from one bath to the other, carried with it some of the liquid of the preceding into the following bath. It is obvious that the cleaner the solution, the more efficiently it operates, and the longer it can be used, and hence such treatment was very imperfect.

To avoid such defects, the heights of the baths are increased, and the ıssage of the travelling band from one bath to the other is prevented ithout interfering with the passage of the paper through all the baths.

As shown in the accompanying drawings, guide rollers, *a*, are arranged ; each side of the baths, being made of material capable of withstanding ıe action of the liquid in the baths. Near the wall of the adjoining ıth, 2, is arranged above the bath, 1, a feed roller, *b*, and in proximity ; the opposite wall is arranged the guide roller, *c*. Starting from the ttĕr roller, an endless band, D, of suitable material descends to the wermost roller, and then passes to the roller opposite the latter, and ıus continuously from one roller, *a*, to the roller, a^1, of the other wall ı a zigzag way, in order to pass finally over the feed roller, *b*, to the ıide roller, *c*.

The feed roller, *b*, is rotated in any suitable manner, the band, D, avelling in the manner set forth, so that, as it leaves the guide roller, s paper-carrying side, which is turned outwardly, remains in the same



ısition when passing over the feed roller, *b*, of the second bath. This an important feature of the invention, as otherwise the paper strip, P, ıuld not be passed from one bath into the other, by reason of each avelling band remaining in its bath. The end of the paper strip, ıich is fixed to the travelling band at the roller, *c*, is drawn by the tter into the bath, traverses the same with the band, D, in a zig-zag ıy, and reaches the feed roller, *b*, turned towards bath No. 2. The ıerative removes the end of the paper strip as shown in the drawings, ıd fixes it upon the band, D, of bath No. 2, which travels similarly the former band through this bath, the said strip reaching the feed ller, b^1, where it is taken off the band, D, and fixed to the band of the ird bath, and so on throughout all the baths.

As each bath has its own band or web, D, it matters not how saturated e latter is with the liquid contained in such bath. On its passage from ıe bath to the other, the liquid carried is only that which adheres to e paper strip, and hence the baths are soiled but to a very small ex- nt. Owing to this horizontal arrangement of the feed, one bath will ffice to treat as many paper strips as were hitherto treated in three or ore baths. Thus the solution used in this bath lasts longer, the paper rip is better supported throughout its travel, and less space is required an heretofore.

From the last bath, that is to say from bath No. 4 in the drawings, the ıt paper strip reaches the drying device, consisting of a long tubular annel, T, bent downwardly and connected to a suitable heating pliance such as H, in such a manner that the heated air ascends in the annel, T, dries the paper strip, P, passing over the guide rollers, *r*, and capes outwardly through the flue pipe, *t*, which may be high enough produce a natural draught of sufficient intensity to dry the paper, or is pipe, *t*, could, if short, be provided with an exhausting device; the per is finely wound up on the roller, W.

ON THE IMPURITIES OF COMMERCIAL CARBIDES OF CALCIUM.

ıE study of the impurities of carbide of calcium is interesting on ɔount of the indications it can give as to the reciprocal affinities of ·tain bodies when heated to a temperature of about 2000°.

After calcium and carbon, the two most abundant elements present are icon and iron. It is possible that definite combinations of either of ese bodies may exist with each of the other three; which are those, we ıy ask, which are formed by preference at the temperature of solidifica- n of calcium carbide?

The iron, which is the least abundant of the four elements under ısideration, might be entirely saturated by one or the other of the naining three. As a matter of fact it is combined exclusively with the .con. It is detected by treating the hydrated carbide with an acid, and ·pending the insoluble residue in iodide of methyl. Small crystals of cide of iron are precipitated; these have been studied by M. Moissan; analysis they have been proved to be $SiFe_2$.

The excess of silicon combines either with the carbon or with the cium according to the relative proportions of these two bodies; if the antity of carbon present is in excess of the calcium, a silicide of carbon ormed, crystallising in apparently hexagonal plates, and generally of a e colour. It is found, with the excess of graphite, floating on the face of the iodide of methyl. If, on the contrary, the quantity of cium is in excess of the quantity of carbon present, a silicide of calcium is formed, which is disseminated throughout the mass of the carbide in the form of metallic grains, having the colour and lustre of zinc. These can be isolated by rapidly quenching the carbide in a large excess of cold water, separating by levigation the coarser residues, and washing them for a few moments with a solution of acetic acid. The final residue is composed of silicide of iron, and of the coarsest grains of silicide of calcium, which have withstood the rapid washings intended to isolate them. In such a case there would be neither graphite nor silicide of carbon present, for this reason, that the calcium must be in excess to allow of the formation of silicide of calcium. In fact, the determining affinities which govern the combination of these elements are those of iron for silicon, and of calcium for carbon. These are first satisfied, and the remaining bodies combine amongst themselves in a manner varying according as one or the other is in preponderating proportion.

There seem to exist two distinct silicides of calcium; one of them is hardly attacked by nitric acid, but is, on the contrary, easily attacked by hydrochloric acid, with the formation of an insoluble yellow matter called *silicone* by Wöhler. The other, easily attacked by nitric and acetic acids, gives, with hydrochloric acid, a deposit not yellow but white, which, like *silicone*, is soluble in potash, with an abundant disengagement of hydrogen.

In the attack of silicide of calcium we more frequently get the yellow and white compounds together. The analyses of these mixtures lead one to suspect compounds between those corresponding to $Si_2O_4H_4$ and $Si_2O_3H_4$. For example, one analysis gave—

Yellow matter	0·52 grm.
Hydrogen given off (0° and 760 mm.)	630 c.c.
Silica	0·57 grm.

which corresponds exactly to the second formula.—*Bull. Soc. Chim.*, Series 3, xvii.-xviii., Nos. 16, 17. H. Le Chatelier.

ALFIERI'S PRINTING-OUT PAPER.

A practical demonstration of the above paper was given before the Chiswick Camera Club, on the 14th inst., by Mr. John A. Hodges. He claimed for the paper great ease and simplicity in working, and the obtainment of a wide range of colour and effect. It specially commended itself to those who desired to obtain warm tones, and to introduce skies by combination printing, and in other ways to exercise control during printing, because the process, being a print-out one, could be "dodged" and controlled to an almost unlimited extent. The paper was obtainable commercially from the Blackfriars Sensitising and Materials Company, was matt-surfaced and of an agreeable texture, neither very rough nor very smooth, and was therefore equally suitable for large or small work. Its keeping qualities were excellent. The lecturer was using paper procured in the hot weather of last July, and it was still absolutely colourless. It would also tone equally well weeks after being printed. Toning might be effected either with platinum or gold. If the latter was employed, the acetate bath was best, and should be used of a strength of one grain of gold to ten ounces of water. This gave warm purples; the phosphate bath gave purple greys and blacks. The chloro-platinite of potash was, perhaps, the best toning agent. A great variety of tones, from reddish sepia to a warm black could be easily obtained. The stock solution was made by dissolving a tube of chloro-platinite of potash in two ounces of water. For warm tones the bath should consist of—

Stock solution	½ drachm.
Water	2 ounces.
Nitric acid	2 minims.

The toning action was very quick, and to avoid over-toning, when warm tones were desired, a weak bath was necessary. For sepias or warm browns the prints should be removed before any very perceptible change of colour occurred, and it was to be borne in mind that they appeared both darker and colder in colour when dry. All free chloride should be removed by washing before toning, neglect of this precaution might injure the lights. It was not necessary to print so deeply when warm tones were aimed at; but, for the purple or black tones, the proofs should be deeply printed. For the latter the toning bath might be stronger, one drachm of the stock solution being used to the same quantity of water. The toning must also be continued much longer, and the prints should not be removed until the desired colour is reached. After washing, to remove any traces of acid, the prints are fixed in—

Hypo	3 ounces.
Water	20 ,,

A stronger bath was apt to eat into the half-tones. The prints should be thoroughly washed in running water, and, having been so treated, would probably prove more permanent than either albumen or P.O.P. If, after toning, the prints appeared over-printed or heavy, they might be reduced by allowing them to remain in the fixing bath for a longer time; but this would alter the tone, making it lighter. In the course of his remarks the lecturer gave a practical demonstration of the process, showing the requisite depth of printing for different tones, the effect of varying the strength of the toning bath, &c. He also handed round a fine series of mounted prints, which fully bore out, in the range of colour shown, all that had been claimed for the paper in the direction of range of tone and variety of effect.

A RETOUCHING PENCIL.

Mr. Mortimer Johnstone has designed a pencil for the purpose of retouching or stippling photographic negatives, consisting of a metal tube or rod which carries the retouching lead, moving freely inside a surrounding casing. The stipple or touch of this movable part of the pencil may be produced by the proper attachment of a small electric bell movement, or the intermittent attraction of an armature or armatures by suitably arranged electro magnets. The novelty consists in a pencil for retouching, similar in appearance and size to the pencil in ordinary use by retouchers, a pencil to which the actuating movement adds but little in bulk or weight attaching the actuating movement in such a way that the pencil may be held in the hand in the same way as the ordinary retoucher's pencil.

Fig. 1 is a longitudinal section.

Fig. 2 side elevation.

Fig. 3 longitudinal section on enlarged scale of rod carrier.

a is an outer casing, in which the electro magnet, consisting of a coil of wire, *b*, and hollow core, *c*, is carried. *d* is the armature which carries

Fig 1.

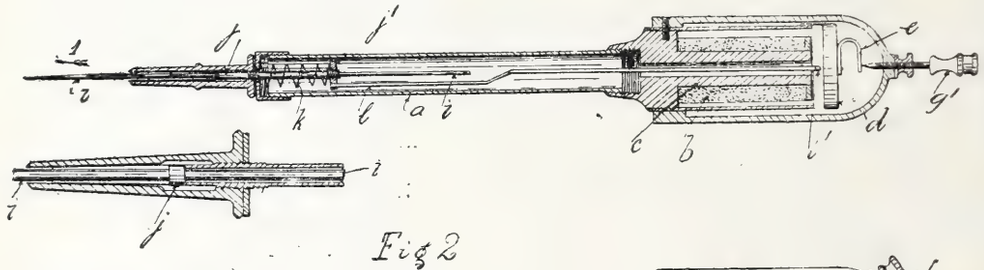
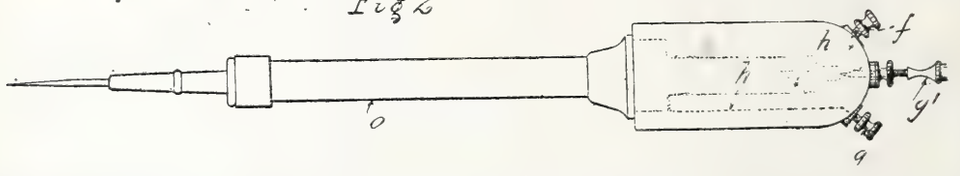


Fig 2



the spring contact pice, *e*. *f* and *g* are two terminals, to which wires for a suitable source of electricity, such as a battery, are secured. g^1 is a regulating screw for the purpose of adjusting the armature, *d*. The course of the current is indicated by the dotted lines, *h*, in fig. 2. The retouching point or pencil, *i*, is carried in the rod-carrier or holder, *j*, having an adjustable nut, j^1, thereon, *k* being a spring interposed between the nut, j^1, and the cap. *l* is a rod connected to this adjustable nut, j^1, which projects through the hollow core, the end being operated by the armature, *d*. When this armature is vibrating by means of the regulating screw, it may be brought into contact with the end, l^1, of the rod, *l*, and thus give a vibratory motion to the same, and which is communicated to the rod-carrier or holder, *j*, the spring, *k*, being for the purpose of bringing the parts back to their initial position, often having been removed in the direction of the arrow, 1, by the action of the armature.

By this arrangement it will be seen that the pencil may be held in the hand in the ordinary way, and, owing to the action of the armature, a vibratory motion is given to the retouching point or pencil, *i*.

THE LEVY SCREEN FOR MAKING PHOTO-MECHANICAL PRINTING PLATES.

The following is Mr. Levy's description of his patented screen :—

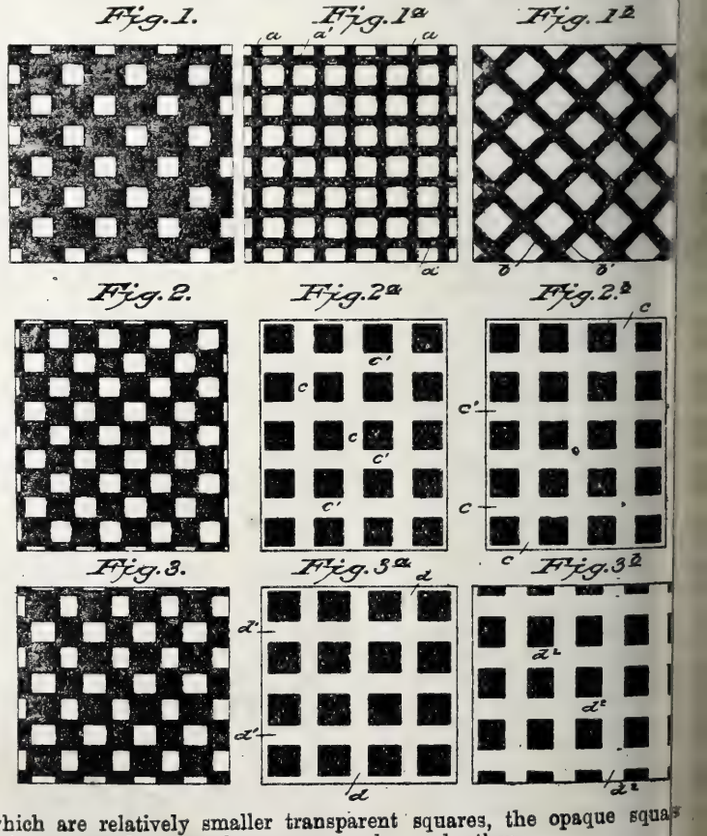
In making a half-tone plate with the aid of a screen, what takes place is, that through each aperture in the screen is formed a distinct image of the lens aperture, and the half-tone negative consists of a regular series of reproduced images of the lens aperture. In order to develop these images clearly, it is necessary to resort to the use of vigorous intensifiers, which shall have the property of building up to the maximum opacity parts of the image having a relatively weak deposit as developed. It will be obvious that in an image of a square placed as above indicated, formed through an aperture in the ordinary cross-lined screen, the corners of the image will fall behind the sides of the aperture, and, as the image is not formed at the point that would be the real focus for the lens aperture, regarding the screen aperture as a pinhole acting in the well-known manner of pinhole photography, it follows that a large portion of the light forming the image will fall behind the opaque line of the screen, and that this portion of the image will be much weaker than the portion formed by the light which has come directly through the aperture of the screen. The developed image thus formed, notwithstanding that it is in form a full image of the aperture in the lens, will have all its corners so weak as to show but an apparently round or octagonal image before intensification. At the same time that the intensification develops these separate images by building up the weaker parts in greater proportion than the denser ones, the effect of the entire picture suffer material loss, as is well attested by all practical workers in this field.

With a screen having apertures arranged with their corners adjacen it will be apparent that, with the same conditions as indicated as th most favourable for the screen formed in cross lines, the separate image of the lens aperture formed through these apertures in the screen wi lie directly in the direction of the sides of these apertures, and that, as consequence, any portion of the image not of full strength will be equa on all sides, and the images will fully overlap each other exactly a the point where this overlapping is necessary to give the effect of dot in the high light of the reproduction, and for the same amount o increase of size of image over screen aperture in this arrangement th maximum excess would be but one-half of what is required in the presen screen.

By the aid of a screen, as hereafter described, it is possible to make so-called screen negative on a gelatine dry plate that will have approx mately the same printing qualities as the best wet-collodion negativ that can be produced with a screen formed of cross lines, and the resu in such a negative will have far more of the delicate gradations of ligh and shade of the original than will the we collodion negative as at present produce The improved screen will also be of advanta over the present form in connexion with th wet-collodion process as at present employe The results to be produced by these screen are similar in general character to those pr duced with cross-line screens, but a mo delicate gradation of light and shade in th negative will always be produced with the ne screen than with the form in general use.

The screen may be constructed in a varie of ways, either by photography, by ruli opaque lines on a transparent ground, or ruling transparent lines through an opaq ground, one of the leading features of t improved screen being in the fact that it pr sents opaque blocks or squares of such size th their corners overlap.

Fig. 1 is a view showing a screen made ruling opaque lines on a transparent groun and in producing such a screen two plates a employed and ruled as shown in figs. 1A and 1B, these plates bei superimposed upon each other, so that the rulings will cross each oth at 45°, and thus produce large rectangular opaque squares, adjacent



which are relatively smaller transparent squares, the opaque squa being arranged so that the corners overlap each other.

Fig. 2 shows one style of screen formed by ruling or produc transparent lines upon an opaque ground, the lines on both plates be on the same scale.

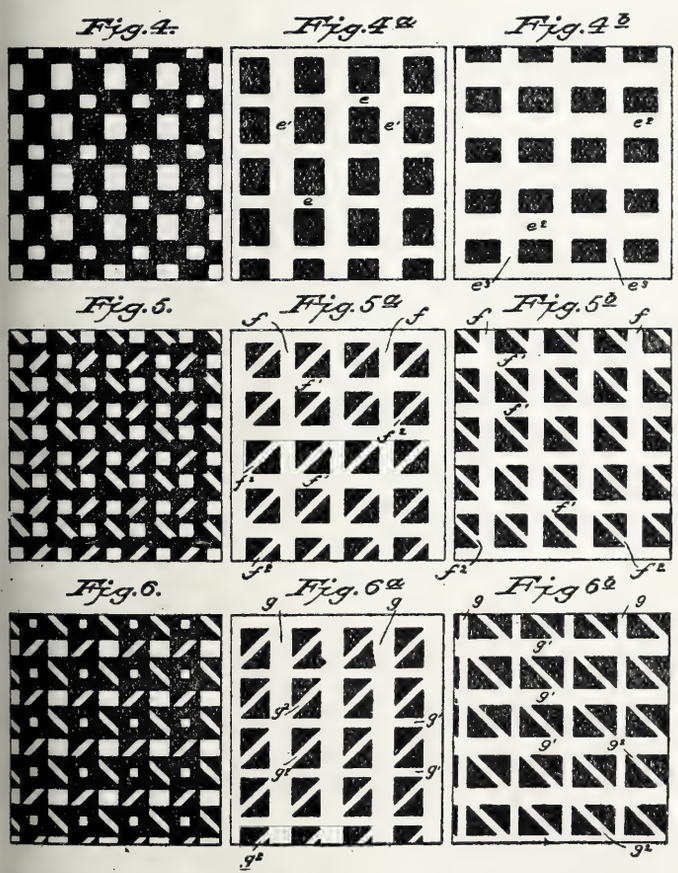
Fig. 3 is a view of a screen which is similar to fig. 2, except that the wo plates are differently ruled.

Fig. 4 is a further modification of a plate produced as shown in figs. 2 nd 3.

Figs. 5 and 6 are views showing gratings or screens produced in the ame manner as figs. 3 and 4, each plate having additional diagonal ines, the diagonal lines being spaced differently to give different results.

In making a screen as shown in fig. 1, there is ruled upon a trans-arent plate, as glass, lines, a and a^1, which cross each other at right ngles, these lines being spaced equidistant. There is then ruled a econd plate, as shown in fig. 1B, with lines, b, b^1, which are of a greater listance apart than the lines, a and a^1, and also of greater thickness, hus producing two plates having opaque cross lines, which are placed one pon the other, so that the several lines will cross each other at an angle of 5°, thereby producing a grating or screen which is practically made up f a series of opaque squares, the corners of which overlap each other nd provide intermediate rectangular transparent apertures, the corners f which are adjacent to each other.

The screen shown in fig. 2 is produced by ruling through an opaque round or by photography, and, if made by ruling, the two plates are laced together to provide rectangular transparent apertures and opaque



squares, the corners of which overlie each other. To produce this screen, the transparent lines of the two plates are of equal width and equally spaced, said lines, c and c^1, crossing each other at right angles, and, as a consequence, leave upon the plates opaque squares all of the same size. When these plates are placed upon each other face to face, they produce the screen shown in fig. 2, in which the corners of the opaque squares overlap each other, and in which the transparent squares are much nearer together than could be produced by a screen ruled as in figs. 1A and 1B.

Figs. 3 and 4 are modified forms of fig. 2, the completed plates presenting overlapping opaque blocks forming apertures combined with oblong apertures, the apertures alternating in the direction of their diagonals. The screen shown in fig. 3 is made up of two plates, figs. 3A and 3B, one having vertical rulings, d, crossed at right angles by rulings, d^1, of greater width than the rulings, b, and the other plate has rulings, d^2, d^2, both of which are of the same width as the rulings, d^1, and equally spaced. When the two plates are placed one upon the other, they will produce a screen or grating presenting a series of relatively large oblong opertures arranged horizontally according to their greatest width, and a series of smaller oblong apertures arranged vertically, the larger and smaller apertures succeeding each other alternately in the direction of their diagonals. In this, as in the other screens, the opaque blocks overlap each other.

In fig. 4, one of the plates is ruled with a comparatively fine line, e, which is crossed by a much wider line, e^1, to produce upon the plate, fig. 4A, oblong blocks arranged in vertical series according to their greatest length, and in fig. 4B the horizontal transparent lines, e^2, are of greater width than the vertical lines, e^3, to present opaque blocks in horizontal series according to their greatest width. When these two plates are placed one upon the other, they will present a screen in which there are relatively larger and smaller transparent squares succeeding each other alternately in the direction of their diagonals, the corners of the oblong opaque blocks of the separate plates overlapping each other.

In fig. 5, there is shown a screen in which the plate, fig. 5A, is ruled with cross lines, $f f^1$, through an opaque ground, leaving opaque squares or blocks, and said squares are crossed diagonally by narrow rulings, f^2, said rulings intersecting the centre of the square. The rulings upon the plate, fig. 5B, are similar, presenting cross lines and diagonal lines, but in this case the diagonal lines cross the opaque blocks to one side of their centre as shown, thereby presenting upon the plate, fig. 5A, triangular opaque blocks of equal size, and upon the plate, fig. 5B, triangular opaque blocks of different sizes. When these plates are placed one upon the other, they produce the screen, shown in fig. 5, presenting transparent squares and intermediate oblong apertures, the ends of which are formed by the overlapping corners of the opaque triangles.

Fig. 6 is a modification of fig. 5, and in this case the plates, fig. 6A, and fig. 6B, which make up the screen, are ruled with transparent lines upon an opaque ground, the cross lines, $g g^1$, being of different width to first present oblong blocks, and said blocks are crossed diagonally by thinner lines, g^2, which cross the centre of said blocks, as shown. In fig. 6A, the oblong blocks are arranged vertically to their greatest width, and in fig. 6B said oblong blocks are arranged horizontally. By this arrangement, the two plates, when placed together, present relatively larger and smaller blocks succeeding each other in the direction of their diagonals, and between said transparent blocks, vertically and horizontally, are formed oblong apertures positioned diagonally.

Screens constructed as herein shown and described obviate the objections appertaining to the printing surface wherein both the black and white dots are connected by thin lines. With the improved screen the dots appear in their proper size, and are disconnected to produce a superior printing surface, and the screen may be termed automatic, as it does not depend to the same extent for successful use upon the screen aperture.

Our Editorial Table.

THE INTERNATIONAL ANNUAL OF ANTHONY'S PHOTOGRAPHIC BULLETIN FOR 1898.

Edited by W. I. SCANDLIN. New York: E. & H. T. Anthony & Co. Bradford: Percy Lund & Co.

MR. SCANDLIN'S book compares very favourably with similar volumes which the enterprise of our American brethren now produces with annual regularity. It is beautifully printed, there are many dozens of very good half-tone reproductions of American photographs and a large number of articles on a wide variety of topics. *Anthony's Annual* is decidedly a delight to the eye, and the photographer will find a very great deal that is instructive and educational in its pages.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, January 6, 1898, at eight o'clock, lecture by Mr. R. Child Bayley, on *Elementary Photographic Optics*. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards which the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

NATURALIST AND CAMERA.—The large hall of the Memorial Hall, Farringdon-street, was well filled on Wednesday night, December 22, by employees of Messrs. Cassell & Co., Limited, who had been invited by Mr. R. Kearton, author of *With Nature and a Camera* to hear something of his own and of his brother's adventures among the birds of our rock-bound coasts. Mr. J. Farlow Wilson presided. *Peeps into Nature's Secrets* was the subject of Mr. Kearton's address, which was illustrated by lantern slides, the secrets concerning, of course, the daily walk and behaviour of our British feathered tribes, hitherto but faintly imagined by naturalist observers, and now photographed for the information of the world. Mr. Kearton's story of his adventures was almost as attractive as his wonderful pictures, the quest of the golden eagle, the island of gannets, and the discovery of the homes and haunts of a hundred birds barely known to us save by their names, giving him abundant opportunities for stirring detail, all the points of which were eagerly seized by an attentive audience. From no farther away than Elstree, near his own home, Mr. Kearton gave his audience ocular evidence of the ignorance it was possible to maintain about our most familiar feathered neighbours.

THE London Stereoscopic Company have arranged with the inventor of the kromskop for a sole West End licence to exhibit and sell the kromskop, and will be glad to send quotations for private or public exhibitions. Full particulars can be obtained from the Manager, Photographic Apparatus Department, the London Stereoscopic and Photographic Company, Limited, 106 and 108, Regent-street, W., and 54, Cheapside, E.C.

ELECTRICITY and spiritualism do not make a good combination. An ingenious attempt to utilise them conjointly nearly gained for its contriver the honour of a coroner's inquest all to himself. A medium, who made a speciality of luminous apparitions, has recently been in much demand among amateur searchers after the marvellous, but will not appear further in consequence of an accident to the electric light. On Monday week, so a correspondent of the *Daily Telegraph* narrates, he gave a *séance* to a number of ladies and gentlemen at the house of a scientific man, and successfully reproduced from his recess in a darkened room the luminous vision of various deceased personages. While Shakespeare was on view, the awe-stricken audience were surprised to hear a gasping, gurgling noise proceeding from his throat, while the head swayed to and fro, as if in pain. A gentleman rushed forward just in time to save the great poet from suffocation by pulling out of his thorax a miniature electric lamp, connected by a slender wire to a small battery underneath his coat. On the principle of the schoolboy's salamander trick of illuminating the face by putting a lighted match in the mouth, the medium caused a faint spiritualistic glow, enough to satisfy wonder-seekers, to suffuse his countenance by inserting, before his hands were tied to ensure confidence, the tiny electric lamp behind his teeth. Unfortunately, in this case the article slipped too far down, and, as the medium's bound hands prevented him pulling it up again, the unfortunate man might have been choked by an incandescent light. But nobody knows what electricity may yet do in the cause of spiritualism.

SOUTH LONDON PHOTOGRAPHIC SOCIETY'S ANNUAL CONCERT.—The annual concert of the South London Photographic Society took place on Monday evening, December 20, at the Hanover Hall, Hanover Park, Peckham, under the direction of Mr. W. R. Jarvis and Mr. F. Sayers, who had prepared an excellent programme, which was highly appreciated by the large audience present. The platform was tastefully decorated with palms, ferns, &c. The proceedings commenced with an overture, the "Bohemian Girl," by Messrs. S. Wolff, E. E. Richardson, Phil Davis. A. Schumann, and S. Wraley (of Mons. Sigmund Wolff's Bijou Orchestra), and throughout the evening this combination delighted the audience with a display of their varied musical talents, giving solos on the violin, cornet and piccolo, and some orchestral pieces. Their rendering of "The Geisha" was worthy of the highest praise. Mr. E. Stone sang sweetly and effectively "Angus Macdonald" and "River of Years," and Miss Alice Jarvis was applauded for her song, "The Flight of Ages." Miss Florence Bostock scored a success with the two songs she sang, and had to respond with an encore. Mr. A. E. Allen's song, "The Soldiers of the Queen;" Mr. W. D. Welford's solo on the one string fiddle, "The Dear Homeland;" and Mr. E. G. Ruckes' recitation, "How Bill Adams Won the Battle of Waterloo," were also well received. The hit of the evening was Messrs. Fred Sayers and Arthur Whitby's comic duet, "You Shan't Play in Our Yard," which created considerable amusement, and so pleased the audience that these artists had to respond with several encores. A very pleasant evening was spent, and Messrs. Jarvis and Sayers thoroughly deserved the vote of thanks, which was carried with enthusiasm.

ILLUMINATED SIGNS IN EDINBURGH.—The Bovril (Limited) Company propose to put up an illuminated electric advertisement upon the walls of James Court, overlooking the Mound and Princes-street; but, before doing so, they expressed a wish to know how such an act would be received by the citizens. In reference to this inquiry on their part, Lord Provost Mitchell Thomson sent the following telegram and letter:—Telegram.—"To Bovril (Limited), 30, Farringdon-street, London, E.C.—My own opinion, and I am sure that of my colleagues and citizens, generally, are strongly against the illuminated advertisements at night. Earnestly trust you will not insist.—LORD PROVOST." Letter.—"Edinburgh, December 18, 1897. Messrs. Bovril (Limited), London. Gentlemen,—I beg to confirm the telegram which I sent you to-day. It was only late last night it came to my knowledge that you proposed to put an electric advertisement on a building facing Princes-street. The citizens are jealous of anything which would interfere with the quiet repose of what is perhaps the finest city view in Europe, and I feel sure that, if your proposal was carried into effect, there would arise a storm of indignation. I trust that this appeal will not be in vain, and that your good feelings will prevent you from carrying out what what would be so much opposed to the wishes of the community.—I am, yours faithfully, MITCHELL THOMSON, Lord Provost." The following letter has been received by Lord Provost Mitchell Thomson from Mr. Andrew Walker, Managing Director of Bovril (Limited), with reference to the proposed illuminated sign on the back of the houses in St. James's Court, overlooking the Mound: "We beg to acknowledge the receipt of your letter of the 18th inst., and of your telegram of the same date, and to inform you that these communications would of themselves have gone far to induce us to abandon our idea of erecting an illuminated sign in Edinburgh. We have, however, received so much weighty evidence that the carrying out of our idea would be directly against the wishes of the citizens as a whole that we defer with pleasure to those wishes."

FROM an Albany (N.Y.) contemporary we take the following interesting account of a lecture on *Shakespeare at Home*, recently delivered by Mrs. Snowden Ward: "Mr. and Mrs. H. Snowden Ward, who have returned to Mrs. Ward's native city for a brief stay, after several years spent in England, were welcomed very cordially by their friends and the Albany Female Academy Alumnæ, of which Mrs. Ward is a member, at the informal reception in the Academy parlours, which followed Mrs. Ward's lecture for the benefit of the Alumnæ's Permanent Fund, given before a large audience in the Study Hall last night. The officers of the Alumnæ, Mrs. Horace Deming, President; Mrs. William Page Newman, Treasurer; and Miss Sarah Sumner, Secretary; with Miss Plympton, of the Academy, *ex-officio*, were of the receiving party. There was a large attendance of the Alumnæ members and friends of Mr. and Mrs. Ward in Albany social circles, and the occasion was an unusually pleasant one, Mrs. Ward's bright wit and happy humour giving the genial touch of intimate friendliness to the gathering and greetings. At the close of this informal ovation Mr. and Mrs. Ward were entertained at a reception given by Mrs. Wheeler, of Lark-street. Mrs. Ward's lecture, *Shakespeare at Home*, drew together a representative gathering of the Society and literary people of Albany, and proved a charming pictorial chronicle of Shakespearian landmarks. The lecture was a bright and piquant commentary on the pictures, and the pictures shown by the stereopticon followed the career of the poet from his birth at Stratford-on-Avon, his school days in the grammar school founded by the Guild of the Holy Cross, his courting days in lovers' lanes, his marriage to Anne Hathaway, the scenes of his married life, the deer-poaching tradition, in which Sir Thomas Lucy figured sternly, Shakespeare's return to Stratford in prosperity and the 'New Place' he bought for his home, his burial place in the parish church of Holy Trinity, and, lastly, some famous portraits and busts of the poet, ending with a primly charming portrait of his daughter, Judith." We wish the editors of our esteemed contemporary, the *Photogram*, a pleasant time in the States.

Patent News.

THE following applications for Patents were made between December 13 and December 18, 1897:—

PLATE-LIFTER.—No. 29,504. "An Improved Device for Holding and Lifting a Photographic Negative Plate or Film in the Developing Process." A. P. TOWL.

FILM-CHANGING.—No. 29,506. "Improvements in or relating to Film changing Photographic Cameras." A. L. ADAMS.

CAMERAS.—No. 29,599. "Improvements in Photographic Cameras." Complete specification. J. L. ATWATER.

BOOK-FORM KINETOSCOPE.—No. 29,616. "A New or Improved Holder or Casing for Book-form Kinetoscopes." H. W. SHORT.

LANTERN-SLIDE CHANGER.—No. 29,694. "Device for Instantaneously Changing Slides for Magic and other View or Picture-projecting Lanterns." A. SUMMERS.

FLASHLIGHT PHOTOGRAPHY.—No. 29,832. "Method of and Apparatus for Igniting Flash Powder in Taking Photographs by Artificial Light." Complete specification. A. WEISS.

SPOOLS.—No. 29,947. "Improvements in or relating to the Film Spools or Reels of Photographic Roll-holders or Roll-holder Cameras." H. J. REDDING.

CAMERAS.—No. 29,973. "Improvements in Photographic Cameras." H. F. CHRISTIE.

PRINTING.—No. 30,027. "Improvements in Apparatus for Photographically Printing from Negatives." F. SUTER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
3.....	Bradford Photo. Society	Ladies' and Children's Night.
3.....	Ealing	Lantern Evening: Hampstead Society Slides and Holborn Society Slides.
3.....	Richmond	Lantern Evening: Members' Slides.
3.....	South London	*Two Men, One Boat, and Three Camera up the Thames.* W. D. Welford.
3.....	Stafford Photo. Society.....	*How to Make an Enlarged Negative.* G. Wray.
4.....	Aintree	Smoking Social.
4.....	Gospel Oak	Demonstration with Stedman's Oxygen Generator. F. Brown.
4.....	Hackney.....	*Halation and its Prevention.* W. Debenham.
4–6.....	Leigh	Annual Exhibition.
5.....	Croydon Camera Club	Council Meeting.—Slides.
5.....	Kingston-on-Thames	Beginners' Night: *Platinotype and Sepiatype.*
5.....	Leytonstone	*Platinotype Printing.* Dr. W. Pickett Turner.
5.....	Photographic Club	*Elementary Photographic Optics.* Child Bayley.
5.....	Polytechnic	Exhibition Week.
6	Leeds Photo. Society	*Portraiture.* Harold Baker.
6.....	Manchester Amateur	*The Limelight.* J.F.Tristram,M.A.,B.Sc.
6.....	Woodford	Travellers' Night. F. G. Emler.
7.....	Croydon Microscopical	Photographic Chat.
7.....	Oldham	Annual *Soirée* and Dance.
7.....	West London.....	*A Roman Holiday.* W. A. Brown.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 23,—Mr. H. C. Rapson in the chair.

The CHAIRMAN said that he had recently had some P.O.P. prints to tone, and went about the operations in the usual way; but he was surprised to find the first washing water turn absolutely brown, and so also the prints. Could it be caused by hyposulphite or iron? he asked.

The question gave rise to some discussion; but, as it was remarked by one present, there might be any number of causes, and it was very difficult to pitch upon the actual one responsible for the present case.

Mr. PHILIP EVERITT said perhaps it was pyro, which would turn the water brown directly. In connexion with this case the question of reserving certain dishes for particular operations and solutions arose, but, by taking effective precautions, there was no reason why one dish should not answer for any and everything. He found this could safely be done by rinsing out the dish between the operations with a bichromate of potash and sulphuric acid solution. It was made up of a five to ten per cent. solution of potassium bichromate, with about an ounce of sulphuric acid to the pyro bottle, which he used for the purpose; and it would last some time, as the stuff could be used again and again.

LIPPMANN'S COLOUR PHOTOGRAPHY.

Mr. A. HADDON showed a form of dark slide he had devised for Professor Lippmann's process of colour photography. In this process the specially prepared sensitive plate has its film in contact with a metallic mirror, which mirror is formed by a layer of mercury contained in a tank of which the photographic plate forms one side. The slide shown took the usual book form, and was made of wood. The requisite pressure upon the glass plate to secure the mercury-tight chamber is provided by a rubber arrangement, which, when the slide is closed, presses the plate upon an edging of chamois leather, which, it is said, is a very suitable material. An iron stop cock projects from the outside of the slide, and on this it is proposed to fit a rubber bulb and tube for the reception of the mercury.

Mr. EDWIN BANKS made a suggestion on the subject of the metallic mirror, recommending the substitution of a silvered plate for the mercury and its accompanying tank. His idea was to silver a glass plate by any recognised means, polish the silver coating, and upon this spread the emulsion. This allowed of direct exposure—that is, not from the back and through the glass itself, and, although the film was so frail and thin, it could easily be stripped off, when the photograph was obtained, for purposes of viewing the coloured effect produced by interference in the film.

Kingston on-Thames and District Photographic Society.—The members of this Society were entertained on the 22nd inst. by representatives of the Richmond Camera Club, who brought with them a very fine assortment of lantern slides made by members of their Club. Owing to approaching holidays and somewhat inclement weather the attendance was smaller than usual, but those who were present thoroughly enjoyed the display, and passed a hearty vote of thanks to their entertainers. The Vice-President expressed a hope that a more frequent interchange of courtesies between local clubs would lead to many more such pleasant evenings. The return visit to Richmond takes place on March 7.

Richmond Camera Club.—The meeting on the 20th inst. was presided over by Mr. Cembrano. The title of Mr. Ardaseer's demonstration,

PHOTOGRAPHIC TINKERING,

had given rise to much speculation amongst members, some of whom were apprehensive of an attempt to corrupt their photographic morals by an introduction to the devious paths of negative-faking. The lecturer, however, was guilty of no such wicked design, but devoted himself to explaining and demonstrating the mode in which a great variety of the minor accessories of the dark room or laboratory can be made at home both easily and cheaply. Beginning with glass, he showed the proper (and, by way of warning, the improper) method of breaking and bending tubes and rods, and proceeded to make syphons of various design, pipettes, stirring rods, a wash bottle, &c. Proceeding to metal, he showed or explained the construction of various articles from wire, such as lime tongs, draining racks, weights, &c. Finally, he gave a lucid exposition of the art of soldering, made a washing tank (somewhat roughly, owing to limitation of time and materials), and stopped leaks in it in a workmanlike manner. The demonstration was as interesting and useful as it was novel, and well earned the cordial vote of thanks which was passed to Mr. Ardaseer at the close of the proceedings.

Dundee and East of Scotland Photographic Association.—The annual *Conversazione* in connexion with the Dundee and East of Scotland Photographic Association was held in the Victoria Art Galleries on Thursday evening, the 23rd inst. There was, as on former occasions, a large attendance of ladies and gentlemen, and, as usual, also numerous side shows, such as Ives's kromskop, the cinematograph, and a very imposing and interesting collection of pictures, were provided by a considerate committee for the amusement and education of the company. The Association has been successful in drawing together a commendable collection of photographic work. The various processes usually adopted in the production of pictures were represented, and, for the benefit of those interested in the progress of the art, a number of specimens by recently invented methods had also been secured. In order to induce others than local artists to exhibit, the Association offered two medals for competition by outsiders, and the local votaries of the camera therefore had an opportunity of comparing their own work with what is being done outside. In addition to the works for competition a selection for display had also been secured, which added considerably to the value of the exhibition from a spectacular point of view. There were altogether 266 pictures on view, and they had been artistically hung on the walls and screen. Messrs. T. S. Robertson, J. Cox Cox, and A. H. Millar were appointed Judges, and their awards were as follows: Members—silver medal, R. S. Park, *Basket of Trout*, carbon, No. 187; bronze medal, W. Ellison, *View at Bruges*, carbon, No. 61. Non-members—silver medal, J. Craig Annan, *A Lombardy Ploughing Team*, carbon, No. 102; bronze medal, W. Crooke, *A. Curle, Esq.*, sepia-platinotype, No. 110.

FORTHCOMING EXHIBITIONS.

1897.

December 31, Jan. 1 Borough Polytechnic Photographic Society. Hon. Secretary, F. W. Bannister, 103, Borough road, S.E.

1898.

January 17–22..... Blairgowrie International. Hon. Secretaries, T. C. Gorrie, Rattray, and J. B. Maclachlan, Blairgowrie.

,, 29–Feb. 26. Edinburgh Photographic Society. Secretary, J. S. McCulloch, W.S., 2 George-street, Edinburgh.

January–February... Photographic Society of India. Exhibition Secretary, 57, Park-street, Calcutta.

April 22–30..... .. National Photographic and Allied Trades Exhibition. A. C. Brookes, Temple House, Temple-avenue, E.C.

,, 27–May 14..... International Photographic Exhibition (Crystal Palace). R. Child Bayley, 12, Hanover-square, W.

There will be Open Classes at the above.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CORRECTION OF DISTORTION PRODUCED BY TILTING THE CAMERA.

To the EDITORS.

GENTLEMEN,—The writer of the article on *The Correction of Distortion*, published in your issue of December 24, apparently forgets that in his article of August 20 he pointed out, and very emphatically, that the height of the "corrected" image there described was "*exactly four inches.*" This statement I have confirmed by repeating his diagram according to the figures given in the article. He now admits that the width of the "corrected" image was 4⅛ inches, but still asserts that the image was square and correct. I cannot follow this argument. If a square can by any possibility measure 4 inches one way and 4⅛ inches the other, then I must admit that, as he kindly suggests, I am "still far from having mastered the barest principles of the subject." He also remarks that I apparently failed to notice that, as there was an enlargement laterally, "the same conditions would operate vertically to produce an enlargement that way." I did notice that not very obscure point, but the vertical enlargement only resulted in the increase of the height from 3$\frac{3}{16}$ inches to 4 inches, insufficient, according to my way of thinking, to produce a perfect square.

Further on, he expresses the opinion that the results I arrived at when studying the *production* of the particular kind of distortion under discussion will "boil down" into the simple statement that "vertical distortion varies in proportion in every part of the image, the upper portion being reduced, the lower increased in height." As a matter of fact, I specially pointed out that, under certain circumstances, the lower portion of the image is not increased but reduced in height. I have now before me a diagram of a very exaggerated case of distortion. The subject is the usual diagram of a chessboard tilted to an angle of 35° from the vertical, or 55° from the axis of the lens. The greatest width of the distorted image is 4·25 inches, the least 3·8. The total height is 3·275. The height of the lowest row of small squares is ·45, that of the top row about ·375. A correct image produced upon the same plane, the diagram being rotated about its centre line until at right angles to the axis of the lens, is 4 inches square, the four squares being ½ inch. Every part of the distorted image is therefore reduced in height, though the width of the lowest portion is increased.

In his "simple" method of correcting the exaggerated case of distortion described in my article, after expressing unbounded astonishment at my failure to find any method at all other than that of reversing the conditions under which it was formed, the writer states that, by inclining the copy and so bringing one part nearer to the lens, "the closer proximity of the lens reduces the width of the lower part (*of the image*) in proportion to the upper, while the exchange of an inclined plane of delineation for a perpendicular one secures the increase of height." If we

exchange an "inclined plane of delineation for a perpendicular one" by inclining the copy towards the lens, the height of the image *is decreased* at first, and no increase takes place until a certain excessive angle of inclination is passed. The reduction of the width cannot therefore be well carried out without further reducing the height of the lower parts of the image, which are already dwarfed as the result of the original distortion.

I should like to add that my article in the ALMANAC was really intended for the JOURNAL, for the former publication does not seem to me to be the proper place in which to criticise matter that has appeared in the latter one. By some mischance the ALMANAC article was published in the JOURNAL, and the one intended for the JOURNAL in the ALMANAC, but I do not know how it occurred.—I am, yours, &c., C. WELBORNE PIPER.

December 27, 1897.

THE GUM-BICHROMATE PROCESS.

To the EDITORS.

GENTLEMEN,—Mr. W. Pouncy is rather late in entering the field, and making claims of originality for methods he had not previously published. Why for the last four years (although the process has been somewhat under a cloud) has he left it to other disinterested individuals to carry out laborious investigations and experiments, and make them public, thereby adding renewed lustre to an already illustrious name? Had he done as others have done, and published the experience he must have gained by his advantageous connexion, the mantle of his father's fame would have been cast around the son, and his services would have been acknowledged with gratitude by many anxious workers.

Purposely, I avoided entering upon the historical question, as full credit had already been given to the original Pouncy by the prior publication of the facts; to have done full justice to all to whom it was due would have taken up more time than could well have been spared from an already long practical discourse.

Much as we admire the excellence of the original Pouncy's work, and giving him full credit for his discoveries, we must not overlook the fact that he, like ourselves, was also greatly indebted for his success to the published information of the properties of the chromic salts, due to Vauquelin, Suckow, Mungo Ponton, Becquerel, Hunt, Fox Talbot, and others. Even the invention of direct pigment printing was shared by himself, Beauregard, Garnier, and Salmon, as is witnessed by the commission of 1859, dividing the 80*l.* Duc de Luynes' prize between himself and the above-named gentleman, although they acknowledged that the initiatory discovery was due to M. Poitevin.—I am, yours, &c.,

JAMES PACKHAM.

THE ROYAL PHOTOGRAPHIC SOCIETY AND THE SALON.

To the EDITORS.

GENTLEMEN,—In reply to "Yorkshireman" in yours of the 24th, perhaps an independent judgment as to which Society has most encouraged "art" in photography may be useful at this juncture, especially as it is written by an artist who comes to the conclusion that photography is not one of the fine arts.

Mr. Joseph Pennell, in the December number of the *Contemporary*, says, *inter alia* :—

"I think, on the whole, the Royal Photographic Society, while it does not pretend to be essentially an artistic body, is more consistent to traditions heretofore accepted as artistic than the Photographic Salon, despite its Franco-British name."

Mr. J. Pennell is to most photographic writers, in all matters that concern art, as is Mr. Sarasate to the street-corner fiddler.—I am, yours, &c.,

OBSERVER.

[Further extracts from Mr. Pennell's article are given in another part of the JOURNAL.—EDS.]

METALLIC CONTACT INSTEAD OF LIGHT ACTION.

To the EDITORS.

GENTLEMEN,—The statement made in your last issue that M. Vial's process was only a method of engraving is not correct. M. Vial claimed to produce prints unaided by the action of light, and without using either an intaglio or a relief surface to print from.

I gathered from the article in the *Photogram* that the *principal idea* of this new process was that prints were produced *without the action* of light. I notice that the patentees in their letter to you acknowledge using similar materials to those used by Vial.

I have simply proved that contact printing without light was worked as a process thirty-four years since by M. Vial, and twenty years prior to that time by Nièpce de St. Victor.—I am, yours, &c.,

Nottingham. JAMES KIRKWOOD.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, *Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 24, *Wellington-street, Strand, London, W.C.*

PHOTOGRAPHS REGISTERED :—

Robert Macfarlane, Stanley Studio, Old Southend-road, Southend-on-Sea.—*Two photographs of Southend taken during the recent flood.*

ADDRESS WANTED.—The address of Mr. Gothard is wanted by Mr. O. C. Haskett, 2, Hastings-road, West Humberstone, Leicester.

BELGIUM.—T. BELL. No permit is required to photograph in Belgium, but you must not photograph in the neighbourhood of forts and the like. There is no Customs' duty to pay on plates or apparatus.

STAINED NEGATIVE.—R. C. The stains caused by printing with damp paper may generally be removed by treating it with a dilute solution of cyanide of potassium. If that does not remove them, we doubt if anything will.

STAINED PRINTS.—T. G. MELTON. Imperfect fixation is, without doubt, the cause, and the recent cold weather may be at the bottom of it. When the temperature is low, a longer time in the fixing solution should be allowed. There is no remedy now but to make fresh prints.

CRAYON WORK.—BEGINNER. 1. Rub the surface of the picture over with either cuttle-fish powder or finely sifted pumice powder. The crayon will then take freely. 2. The ordinary crayon as supplied by the artists' colourmen. 3. Carbon pictures are made on rough drawing-paper to order.

PHOTOGRAPHIC PAPER.—W. R. R. Yes. The Saxe photographic paper may be had in continuous lengths, between 50 and 60 inches wide, wholesale, of Otto König & Co., Cross-street, Finsbury. We doubt, however, if you will be able to purchase so small a quantity as a few dozen yards at a time.

LENS.—S. DRUCE. The lens, from the description, is an old form of Petzval lens with two extra lenses to be placed between the combinations, the one to shorten the focus and the other to lengthen it. The latter will enable the lens to be used for a larger-size picture than the half-plate, for which the instrument is, normally, intended to cover.

PATENT.—C. S. W. You are under a total misapprehension. You will not be entitled to apply the term "patent" to your invention until you have actually obtained the patent. With a provisional protection only you must not use the word patent. The most you can do is to use the term "patent applied for," if that is of any use to you for trade purposes.

PATENT.—A. DEWAR. If a description of the apparatus has been published, although it has not been made for sale commercially or even sold at all, a valid patent cannot be obtained for it. It is true a patent may be taken out; so one can be, according to our patent laws, for almost anything, but what would be the good of it if not valid—except, perhaps, for "bluff?" That sometimes goes a long way, however.

CARBON PRINTING.—A. WILLIS. The failure is readily accounted for. Three minutes' immersion of the tissue in a ten per cent. solation of the bichromate of potash is almost sure to lead to failure, except under very abnormal circumstances. That time of immersion, at a temperature of 55° or 60° Fahr., is ample, for all general purposes, in a five per cent. solution, and that is rarely exceeded, except for very special reasons.

HALF-TONE SCREEN.—L. M. writes: "Will Mr. Bolton or other experienced worker kindly assist me? I wish to make a grained screen for mechanical printing experiments, and find I can obtain wire gauge of sixty lines to inch. Can I take a negative of this against a uniform diffused light (sky, for instance), and thus obtain a cross-grain screen? Will it be better to back a photo-mechanical plate, or is such plate a sufficient safeguard against halation fogging the lines? I have advertised for a quarter-plate screen, but have received no replies. As they are rather expensive, I wish to make one myself. Any help will be greatly valued."

CEMETERY PHOTOGRAPHY.—ANXIOUS writes: "The other day I was sent to photograph a headstone in a cemetery, and, seeing another nice headstone, I thought I would photograph it for myself—not for sale, but, knowing the owner of it, told him that I had a splendid photograph of the stone if he would like one, but was both surprised and annoyed at him asking me who had given me permission to take it, and telling me I had no business there with the camera. I may say that the cemetery was open, and he had nothing to do with it. I should be very grateful if you can tell me if it is allowed in taking any such things for myself or sale."—In reply: Probably you were within your strict *legal* right; but, had we been in your place, we shonld have first ascertained whether it was agreeable to your friend to have the tombstone photographed. We can perfectly understand his surprise and annoyance.

MONTHLY SUPPLEMENT

) THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*January* 1, 1897.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

RITING on the subject of toning chloride lantern slides, Mr. G. uille, in the *Photographic Times*, says: "To obtain transparency the high lights, it is absolutely necessary to back the plate with a mpound that will prevent halation. A mixture of yellow ochre, xtrine, glycerine, and sufficient water, answers the purpose very ell. A piece of red blotting-paper is placed over this mixture hich is not allowed to dry), and the exposure made. The backing n be removed with a wet sponge before development. For velopment I prefer hydroquinone with potash. After fixing and ashing for a quarter of an hour or so, the plates are toned. lmost any toning bath can be used, but the one I prefer is the cetate of soda, it gives very rich tones, varying from red-brown black. It should be used when freshly prepared, and the plate moved before the desired tone is arrived at, as the toning action ill continue after removal. After washing, the plate is again fixed fresh hypo solution, which also serves to clear the image, and bsequently immersed in a five per cent. solution of chrome alum."

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THE "Aptus" combination lantern screen and background is one the latest productions of Messrs. Sharp & Hitchmough, of Dale-reet, Liverpool. The fabric is absolutely opaque; one side has a hite surface, the other a neutral tint, and thus it serves either as a reen or a background, as occasion requires. It is mounted on llers top and bottom, in one piece, without seam.

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MR. W. HUME, of 1, Lothian-street, Edinburgh, sends us his terim list—1896-97—of the Cantilever enlarging apparatus. The ell-known lantern figures in a variety of patterns designed for many rposes. The Cantilever's long and unabated popularity attests its acticability and satisfactory qualities.

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MR. J. FALLOWFIELD, of 146, Charing Cross-road, W.C., has sued a condensed price-list of magic lanterns and materials, winter hotographic goods, and flashlight apparatus. Those engaged in ntern or flashlight work will find in the pages of this catalogue lustrated particulars of the latest apparatus, &c., designed there-or.

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MESSRS. W. WATSON & SONS' (313, High Holborn) illustrated atalogue of optical lanterns, apparatus, and slides extends to over 120 pages, and is therefore very exhaustive. Lanterns, jets, arc lamps, slide-carriers, and other adjuncts of projection work, are illustrated and described, and the sets of slides listed are very numerous.

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THE *Revue de L'Acétylène*, published at 17, Rue Fontaine au Roi, Paris, is a monthly publication devoted to the applications and uses of calcium carbide, upon which subject it contains several interesting articles. It is in its sixth month, and is published at forty centimes per copy.

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MR. H. N. KING, of 4, Avenue-road, Goldhawk-road, W., forwards us his synopsis of photographic publications, including views of public buildings, royal palaces, copies of pictures, and the late Vernon Heath's works. Glass and paper stereoscopic views are among the specialities of Mr. King, who, though one of our oldest photographers, still remains in the very forefront in virtue of the beautiful qualities of all his productions.

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PROFESSOR SILVANUS P. THOMPSON is delivering a course of "Juvenile" Lectures on *Light, Visible and Invisible*, at the Royal Institution, at three o'clock in the afternoons. Two of the lectures entitled *Lights and Shadows* and *The Visible Spectrum and the Eye*, have been delivered. The remaining four will be delivered as follows:—January 2, *Polarisation of Light*; January 5, *The Invisible Spectrum* (ultra-violet part); January 7, *The Invisible Spectrum* (infra red part); January 9, *Röntgen Light*.

LANTERN MEMS.

"No acetelyne generator should be in the house, and, if you do not arrange this on your own account, the fire insurance companies will take good care you do on theirs." Such were the words, in substance, uttered by Professor Lewes in his lecture, at the Society of Arts, on acetelyne gas. There was much to be said in favour of the light, and also against its indiscriminate use, that I think a summary of his observations will probably be interesting to photographers and lanternists.

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THE illumination of acetelyne gas, as compared with coal gas, is largely in favour of the former for consumption per cubic foot, the former giving an average of twenty to twenty-five candle power for one foot per hour against five candle power for house gas. Some acetelyne gas gives as much as thirty-two to thirty-four candle power from the purest calcium carbide as produced in the electrical furnace; but, in the announcement of the earlier discoveries of the gas, the average was stated to be fifty candle power.

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WITHIN the last year the commercial manufacture of acetylene, or ethine, as it is sometimes called, has been possible by an accidental discovery, in 1893 or 1894, of Mr. Wilson in North Carolina.

He had set up an electrical furnace near some waterfalls for the purpose of making aluminium, and, being prevented by some one's patent rights to a similar process, turned his attention to lime and charcoal with the idea of producing a metal of value. Finding, on examination, that, although in appearance the resultant looked metallic, it had no strength, in disgust he threw the remainder of the contents of the furnace in a stream near by. No sooner had he done so than it fizzed and fumed, and the wind wafted towards him "a stink he had rarely smelt."

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Repeating his experiments and putting the calcium carbide in a vessel of water, and collecting the gas driven off, he found it gave an excellent light on ignition, far surpassing in brilliancy coal gas. This turned out to be the same kind of gas made in a most tedious and troublesome manner, and necessarily in small quantities, by Edmund Davy in 1836 and Berthelot in 1859.

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It has been stated by certain inventors of apparatus that the calcium carbide can be purchased at 7*l.* per ton, but, after every inquiry, Professor Lewes found it cost from 18*l.* to 28*l.* per ton the former being the German quality, giving about 3·5 cubic feet per pound, while the English gave about 5 cubic feet per pound (4·54 to 5·3). It is satisfactory to know the British carbide had 99 per cent. of true calcic carbide, and, although at per ton the material was dearer, the resultant gas was much richer and purer.

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The purity of the gas is a most important factor, for impurities mean danger, and, although not explosive when dry, the carbide has to be most carefully treated and conveyed, for, if it accidentally became wet during transit, it might spontaneously ignite. A simple and very telling experiment was shown by the Professor, who placed a piece of pure calcic carbide in a dish and poured water on it, and when the gas was thus liberated he ignited it on applying a light. With impure calcium carbide and some of the same water placed on it, after a very few seconds it ignited spontaneously.

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Regarding apparatus, the lecturer made the startling announcement that nine-tenths of the generators were of very little use and some dangerous. The great thing to guard against is any increasing pressure, or any chance of contact with air, and it is desirable that a proportionately small amount of carbide be acted on at a time. The explosion that occurred in Berlin, and was announced a day or so after the lecture referred to was given, shows that compression must not be resorted to.

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The burners suitable for this gas burn for a time extremely well, but as a rule they only have a short life—100 to 400 hours. They become incrusted with some of the products or deposits in the gas.

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It is very amusing at times to read the daily and weekly papers on technical matters, and more particularly in connexion with photographic subjects; but, when one of them specially devoted to light literature gives an account of photographing a struggle in a room between a dying man and a spirit or demon, whose presence could be felt but not seen—an ordinary hand camera is supposed to be used, and an instantaneous exposure made—it is a little too much, even for a lay reader.

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But this is a small matter compared with the detail, that he took the plate out of the camera, and saw distinctly that he had obtained a successful photographic record of the struggle, and the fiend's hands could be seen gripping tightly the throat of the man. Many a time and oft have amateur photographers wished they could open the camera and see the result of their snap-shots without waiting to go to the dark room and go through the process of development of the negative. When the day comes for instantaneous exposures to be possible in a room dimly lighted, such as the one referred to, then will be the photographer's time for wonderful records, and a new series of pictures, for projection or otherwise, will be possible.

I am glad to see among the life-model slides for the lantern that series has been added of classical subjects, with Egyptian, Moorish and Grecian surroundings, the courts at the Crystal Palace having been the locale for the groups or figures to be arranged or posed the Alhambra, fountains, &c., aiding the artist, who must be complimented on the success he has obtained in the dozen or so specimens I recently saw. It opens up a possible future for reproducing historical episodes from such lives as Cleopatra, Alexander the Great, &c., or, perhaps, for illustrating Grecian mythology.

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According to the extract from the local newspaper of Newquay Cornwall, Mr. Bennetto has disposed of his invention for producing colour-photography slides, and, if one can read between the lines, he has received a good round sum for the same. As he is disposing of his studio and photographic business, one can only suppose he is going to devote himself entirely to special work. I trust that soon a London audience will be able to see some of the examples of his work projected on a large scale, and that they will be as successful then as they were when I saw them, and be appreciated at their artistic and technical value.

I wish all lanternists and readers of these "Mems." a happy and prosperous New Year. G. R. Baker.

A NEW DEPARTURE IN ELECTRIC LANTERN WORK.

To the last Lantern Record published in 1895, I contributed an article on the alternating current, as applied to the electric arc light for optical lanterns and other projection purposes, in the course of which I pointed out the many objections that may be urged against this kind of electricity from the lanternist's point of view. Unfortunately, or fortunately according to the light in which you view the matter, very few of these objections apply to ordinary electric lighting; and, as under certain circumstances which are becoming very prevalent the alternating current is considerably more economical than the other variety, more especially as concerns the supply companies, this form of electricity is quite as frequently to be met with as the preferable continuous current.

It must be remembered that electrical power is measured in watts, or perhaps a more familiar term is the Board of Trade "unit," which is a thousand watts, and is, therefore, sometimes called a "kilowatt." A watt is equivalent to one ampère multiplied by one volt, so it follows that, to find out the power of any given electrical supply in watts, it is merely necessary to multiply the amount of the current in ampères by the pressure which drives it, and which is measured in volts. Thus a current of five ampères, at the usual pressure of 100 volts, represents three pennyworth of electricity, taking the average price of sixpence per B. T. unit as the basis of the calculation, for five ampères, multiplied by 100 volts, equals 500 watts, which is half a unit.

Now, precisely the same value of electricity would be represented by a current of fifty ampères at a pressure of ten volts, for $10 \times 50 = 50$ watts. But—and hereby hangs the tale—in the latter case the wire conductors which carry the current from the dynamos to the place of consumption would have to be ten times the thickness, for the size of electric "leads" is determined by the amperage that they are to carry. The laying of the mains, and the size of the copper conductors is one of the most expensive factors that the electricity supply companies have to reckon with, consequently they would very much prefer to supply customers at high pressure, so that a considerable value of electricity could, on account of the comparative smallness of the current, be passed through thin, and therefore inexpensive, wires.

However, the customer does not want his current at this high potential. It is of no use to him in that form in the majority of cases. Continuous current electricity must be made by the suppliers at the pressure that the consumer requires. The alternating variety can be generated and transmitted at any potential which suits the suppliers, for it can be transformed down to any pressure that the consumer likes, by means of a simple piece of apparatus in his own cellar.

It is true that in this transforming process there is, as might be imagined, a certain amount of waste, and in other respects the alternating current is not quite so efficient as the continuous variety in those cases where the district to be supplied is a compact one, necessitating only a limited length of mains; but, in straggling towns, or in cases like that of the city of London, where it is convenient to situate the generating station several miles away, at Deptford, the slight incon-

nience and these small wastes are nothing compared to the immense ving effected in laying down the original installation, and keeping it in pair.

So much for the reasons why this troublesome alternating current is often to be met with. Now let us call in review again the circumnces which make it objectionable from the lanternist's point of view.

It must be remembered that the chief origin of the light emitted by an c lamp working on a continuous current circuit is the little crater which rms at the end of the positive carbon, and that, by placing this carbon ghtly behind the negative one, that crater is caused to form on the ont edge of the carbon rod, so that all its light is projected forward to the lens system. Now, with the alternating current, there is a ndency on the part of the carbons to share equally between them the res and responsibilities of both negative and positive, and each burns to a blunt point with an attempt at a crater at the end. Moreover, it necessary to encourage these crater-forming propensities, by using rbons having a central core of softer and faster-burning material, or it ill be found that the arc will wander round and round on the carbon oints, casting, at one moment, a most brilliant light upon the screen hen the arc happens to be burning on the side nearest to the lenses, id, at the next, leaving the picture almost in darkness when the light ifts round to the back of the carbons.

The effect of using cored carbons is to hold the arc to the centre to a reat extent, but it still partially retains its nomadic instincts, and the ght upon the screen, even under the best conditions, varies periodically a brilliancy, every now and again shining out with twice the light that exhibits at other times. But there is another and still worse haracteristic of the alternating current arc with cored carbons, for the esult of forcing each carbon to form a distinct crater is, that all the light om the upper one shines in a downward direction, while all that from ne lower is projected upwards. Horizontally, there is practically none, or there is only the light from the edges of the craters, and that of the ctual arc itself, which is purple in colour. Consequently, when the light s burning at its steadiest, showing that the arc is confining its attentions o the centre of the carbons, there is always a deep purple shadow right cross the centre of the disc.

Up to the present there has been only one practicable way of overoming this difficulty, and that is unsatisfactory, in that it wastes xactly half the available light. It is accomplished by tilting the whole amp backwards through about 30°, whereby the "shadow band" is hrown out of the field altogether, and only the light from the upper rater used for projection, while all of that from the other carbon is ntirely wasted. I have tried every plan I could think of to overcome he difficulty, but without success. At one time, I thought I had nearly ucceeded in forcing the arc to take up its position on the front edges of he carbons permanently, by taking advantage of the powerful repellent ction which a magnet is known to exert over the electric arc. At first, results were *nil*, for the alternating arc simply doesn't care anything for an rdinary magnet; but, when an alternating magnet was tried upon it, it was obliged to alter its line of action. These magnets were easily made by twisting a short length of stout, insulated wire into small coils or helices, and obliging the current to pass around one of these before it eached the lamp. When such a magnet was held near the arc, it did ot exactly repel it to the other side, but it caused it to take up a osition at either the right or left-hand side of the coil. I suppose there s some rule by which the position which the arc should take up under hese circumstances is controlled, but I could not find it out, except that t always did exactly the opposite of what was expected. It was partly his uncertainty, and partly the fact that the magnetic influence seemed o have a very unhealthy effect upon the arc light's temper, as it were, ugmenting the humming noise it always emits, causing it to hiss sometimes, and sometimes blowing it out altogether, that made me give up he experiments: But one thing was made certain, and that is, that hen the arc can be made to burn permanently on one side of the carbon oints, so that the two craters become tilted away from one another, hus throwing all their light out in one direction, the much-maligned lternating current will yield a most beautiful light. The difficulty was to ind some means of bringing this result about in such a manner that no fresh omplications were introduced, and that the effect was certain, and one to e relied upon, and that I could never do.

But, while I was trying to bring about the result by electrical means in he manner indicated, my father—Mr. T. C. Hepworth—thought of a imple mechanical means of producing the effect that we had been xperimenting for. He had a few carbon rods made, in which the core, nstead of being central and in a line with the axis of the rods, was placed lightly towards one side; this seemed a very simple way out of the difficulty, and, when it came to be tried, the result more than justified expectation.

Two of these eccentrically cored carbons were placed in an ordinary hand-feed projection arc lamp in such a manner that one was exactly over the other in the same straight line, and both had the sides to which the cores were nearest facing the lenses. Then the light was started and the effect noted upon the screen. At first the disc presented the usual appearance that has come to be associated with the alternating current arc in an optical lantern, that is to say, the light was not over-brilliant and there was a well-defined violet band across the middle of the sheet. But the quality of the light did not vary; it was steady from the first, showing that the arc developed no tendency to wander from place to place on the carbon points. After a while, as the carbon burnt away, the amount of light gradually increased, and at the same time the purple shadow band slowly melted away.

After the lapse of about four minutes, the arc seemed to have settled down to the way in which it intended to burn and no further changes were forthcoming. At that time, and, indeed right up to the end of the trial, which lasted some three quarters of an hour, the disc was perfectly clear without the least trace of the distressing band of shadow. The light was far more brilliant than is usual with the alternating current, and the cause of this was easily found when we discovered that there was practically no light at all at the back of the lamp—nothing, in fact, but the purple shadow which appeared to have all collected at the rear, leaving the front quite free. The light burned perfectly steadily with no attempts at the fluctuation which is the result of a wandering arc, and but one drawback, and that easily avoidable, as I will show.

When the light was extinguished, the shape of the carbon points was critically examined. Their appearance was very much the same as that of any pair of cored carbons which had been used for an arc lamp on an alternating circuit with this important difference. In both cases the craters instead of being at the ends of the rods and with their edges at right angles to the length, were shifted decidedly to one side, so that their edges formed an angle of about 80° instead of 90° with the axis of the rods. Hence all the light from the craters shone out at one side of the lamp, while at the other there was nothing but the light of the arc itself, which is very little, and that little purple.

The possible drawback that I mentioned just now is this: It is the natural consequence of this tilting of the craters that the two carbons shall be much nearer to one another at the back of the lamp than in front, and electricity, as we know, has a partiality for taking the shortest cut; that is, if the shortest path happens to be also the best—which does not always follow. It does not follow in this case, for the arc plays between the two cores of the carbons and not between the closer together but more refractory surrounding portions. But, if through careless manipulation the two back edges of the carbons are allowed to actually touch one another, the arc will immediately jump to that point, and it will burn there for a few moments when once it is started in spite of anything that you can do. The effect upon the screen is that the light is suddenly reduced to little more than half its former brilliancy, which, however, it will soon regain when the arc slips back to its former position.

There still remains one objection to the arc running on an alternating circuit, which it seems impossible to overcome, and that is the inseparable humming noise which always keeps up a running accompaniment. This might be a serious drawback in a small hall, but in larger buildings it is scarcely noticeable except to the lanternist and a few people close around the lantern, and when a cinematoscope is in use—and electric projection lamps are more used in this connexion than perhaps any other—it does not matter in the least.

CECIL M. HEPWORTH.

ON THE REDUCTION AND INTENSIFICATION OF LANTERN SLIDES.

III.

In a previous article I referred to the great improvement effected by means of first reducing, and finally intensifying, a lantern slide, this improvement being specially noticeable in subjects where the slightest traces of veiling required to be removed before any attempt at intensification took place, such as slides of printed matter, designs in black-and-white, and all similar subjects where absolute clear glass and the utmost opacity represent their various parts of the slide.

The application of a solution of ferricyanide of potassium is generally understood to refer to the entire slide being immersed in a bath of such, by which means the whole surface of the picture is subjected to the action of this invaluable reducing agent—and, no doubt, there are many

workers who hesitate to apply such treatment to many examples, for the simple reason that they judge such an application would, very possibly, do more harm than good, the reduction not being desirable over the entire surface of the film, but merely in one or two isolated places where a degradation of the high lights has taken place, and where only such a reduction would confer any benefit to the slide.

Numerous examples of these subjects might be mentioned, such as dirty skies, waterfalls, white draperies, &c., all of which may be termed beauty spots in an otherwise sombre surrounding of backgrounds.

When such portions of a slide have to be dealt with, there is no necessity for the entire plate being immersed in the reducing bath, for it is quite an easy matter to apply the ferricyanide of potassium to such places without their surroundings suffering in the slightest extent from the application of such.

To effect reduction in isolated spots or places, the slide should be drained free from all surface moisture. This is easily effected by rearing it on end on a clean pad of linen, such as a handkerchief, folded, so as to absorb all the surface water as rapidly as possible. If the slide has been properly washed and treated in development and fixing, all surface water ought to find its way down to the bottom without any special attention being given to the job; but, should there prove to be some patches that will not yield up the water, but show as tear drops of varying dimensions, then the slide may be touched gently with the corner of the clean linen pad to absorb the same, and, by gently wafting the slide in front of a clear fire, free from all dust, a few seconds will suffice to bring the slide into such a condition as will permit of any isolated parts being worked upon by the reducing agent, without in any way spreading to those surrounding portions where it is not desired to apply it.

This condition of the film may be described as when that stage in drying has been reached where the gelatine shows only a swelled appearance, entirely free from surface water.

When in this condition, the slide is placed upon an upright stand, or one very nearly upright, in which sufficient light is reflected up from beneath. By taking such a stand in close proximity to a good light, which may either be a window by daylight, or a good paraffin lamp or gas jet if the work has to be conducted at night, the finest possible work may be effected with the aid of a finely pointed camel's-hair brush.

A tall box, with one of the sides knocked out, at one end of which supports are made to hold an ordinary carrier for holding the wet slide, makes a first-rate stand for keeping the wet plate in a suitable position to permit of fine touching being conducted. The brushes—for there should be several of them, of varying sizes—should be carefully used in work of this kind. Those only that are to apply the solution should be carefully preserved in long lead pencil cases; those that are to do duty as mops for drying off the work when it is judged sufficient reduction has taken place must be kept by themselves also, and all must be scrupulously clean.

When such aids are forthcoming for this work, let the worker, if his eyesight is not of the very best, procure a pair of magnifying spectacles. This will enable him to have both hands free, and then, with their aid, let him sit down comfortably and well scan the entire surface of the slide; and, having done this, let him make up his mind as to the exact portions he considers would be benefited by reduction. Having made up his mind, let him take a fine camel's-hair brush, with a long point, and charge it well with the solution of ferricyanide of potassium and hypo which I described in my former article, and, having entirely charged the brush, the same must be freed of the solution, and only appear to be in a damp condition. With the brush in this state, the moist surface of the film is touched very gently, taking care not to work up to the very extremes of boundary. A very little practice will enable a worker to judge how far the moistened brush ought to be made te touch. The application of the damp brush with the ferric-cyanide of potassium will soon make its presence felt, and a beautiful gradual reduction will go on if the solution has not been used too strong.

When judged sufficient, the dry camel's-hair brush may be used to mop off the surface moisture from ferricyanide of potassium, or the slide may be vigorously washed under the stream of a running tap of water.

It is obvious that such work partakes more or less of delicate manipulation, but it is an undertaking that any steady hand can accomplish with a little practice without in any way injuring the surrounding portions.

The beauty spots are of the utmost importance in all first-class lantern slides, and show up in a marvellous manner when an otherwise flat production is projected on the screen. I often think they represent in lantern slides what Landseer's little bit of red does in his magnificent painting.

It is, however, not only in the treatment of slides to such local reduction as I have stated that improvements can be effected; it often happens that it is desired to add density to such small parts, and here, again, this mode of procedure is of the utmost value when intensification has to be performed. To effect such, a distinct set of brushes must be employed, and, having the slide in the same moist condition, so far as the film is concerned, a solution of mercury and salt of the proper strength should be applied in the same manner by means of finely pointed camel's-hair pencils. The moment the mercury is applied to the film the eye will detect the usual symptoms of the film clouding over, and finally assuming the well-known milky-white appearance.

I often think, however, it is much preferable, where very fine lines have to be treated or worked up, that the slide be first dried, and then, by means of the finely pointed pencils, only those portions moistened that it is desired to act upon. By this means it is easily seen if the work has been carefully performed before the mercury is applied; in any case, the treatment is most effectual whichever way it is applied. When the film has been thoroughly acted upon, the usual copious washing must be resorted to, and a wash of ammonia applied with a brush to the parts affected with the mercury will never fail to yield any amount of increased density.

By such means the utmost improvement in some samples of lantern slides may be effected; but, at the present ruinous commercial prices for the production of slides, is it any wonder that professional workers decline not only to undertake this work under any circumstances, or if they do agree to produce such at a price that barely pays for the material, quite ignore such delicate operations as I have described, simply because the remuneration at the present time does not compensate for the extra time and trouble?

I don't know what it is with others in England, but I know that in the West of Scotland it is stated that at the present moment slides are being prepared at a cost of fourpence halfpenny each, and only quite lately one well-known worker intimated his withdrawal from slide productions, much to the chagrin of some who cannot very well do without transparencies from his negatives. In time let us hope such ruinous prices will cure the evil of which the first glimmer of hope appears already in the horizon.

If it be true that the optical lantern is losing its fascination for the public—and there are strong indications of such being the case in Scotland, to judge of the experience of professional lecturers whose occupation may be said to have gone—is it too much to say that the cut-throat prices at which lantern slides are being produced have not a good deal to do with this state of things?

I can point to more than one gentleman who for years carefully studied to produce negatives with a view of lantern slides being placed on the market from the same; but now, oh, dear no, not at fourpence halfpenny each.

T. N. Armstrong.

A CHAT UPON LANTERN SLIDE-MAKING.

[Photographic Scraps.]

I suppose, in the course of something like twenty-five years' strong devotion to photography, it has been my lot to examine and criticise as many lantern slides as most men, and, as the result of that experience, I think, from a technical point of view, the bad slides may be broadly classified in two divisions, *i.e.*, those that are too dense and those that are too thin.

Now, the difficulty of a beginner, who has not the advantage of an experienced photographic acquaintance to whom application for assistance can be made, is in knowing *where* he has gone wrong, and *how* he has gone wrong. Probably he has never seen a perfect slide, and has not the remotest idea of the procedure necessary to produce one. The best advice I can offer in such a case is that he procure, by hook or by crook, a technically good lantern slide, and, having done so, let him then institute a careful comparison between it and his own work, and note wherein the differences lie.

It is difficult, if not impossible, to produce a good slide from a bad negative. But what is the best kind of negative for the purpose? Well, one that will give a nice print in P.O.P. ought to give equally good lantern slides—that is to say, it ought to be correctly exposed, and developed so as to avoid an excess of density, any hard patches of the latter are always an objectionable feature in a negative from which a lantern slide is to be made.

Having selected some suitable negatives, the next question to determine is whether to make the slides by contact or reduction. If the negatives are larger than quarter-plate, there will be no alternative; but, if they happen to be of that size, perhaps contact printing will be the easiest method for a beginner, not, however, that reducing presents any real difficulty, even to a novice. Black-coloured slides will perhaps be easier to produce at first than those of warmer tints; but, as the Ilford special lantern plates, which should be used for this purpose, are rather rapid, some care should be taken to ensure that the exposure is correct. If a light of the same intensity is always used, and the printing frame be held at the same distance from it, two of the chief factors which determine exposure will be constant and uniformity of results more easily attained. Correct exposure will produce a pure engraving black, very pleasing for almost any subject—under-exposure will lead to the production of a greenish-black colour, more or less pronounced according to the degree of under-exposure, and an unpleasant hardness and lack of half-tone. Over-exposure is indicated by the image appearing of a brownish or rusty-black colour, developing up quickly, and being thin and wanting in contrast when fixed.

In regard to developers, hydroquinone is almost universally employed by amateur workers, and, if properly used, it is very suitable for lantern-slide work. For black-coloured slides the formula given in the Ilford Company's instructions cannot be improved upon, though, for the production of warm tones, I prefer pyro. Let me emphasise the fact, that to obtain a pure strong black a normal developer must be used and an

roximately accurate exposure given, error in one direction or the other produce the results above described. If the exposure has been rect, the image will appear regularly, and gradually grow in detail and sity. The latter must be judged by holding the plate up to the lamp, l examining it by transmitted light, no idea of the real density can formed by the appearance of the slide in the developing dish. Develnent must be continued until the slide appears, by transmitted light, be a little overdense (a slight reduction taking place in the fixing h), in fact, until the high lights just begin to show an inclination to or veil over. If this happens before the plate has attained sufficient nsity, it is a sure sign of over-exposure. Directly sufficient density s been obtained, the plate must be thoroughly washed under the tap, l all traces of developer removed before it goes into the fixing bath. his be not attended to, stains are sure to result. At least ten minutes ould be allowed in the fixing bath; the silver bromide will have parently disappeared in much less time than this; but, if the slides be t thoroughly fixed, their future permanence cannot be relied upon. A ntern slide, it should be remembered, is subjected to very trying conions, the vehicle in which the image is held—gelatine—is of an eedingly hygroscopic nature, or, in other words, greedily absorbs isture from the atmosphere, and, in addition to this, the slide, when in e lantern, is subjected to very great heat, two extremes which, of course, id to promote any tendency to fading or deterioration by subsequent emical action.

Inattention to these facts has given gelatine slides an undeservedly d name with some people, who allege that they lack keeping operties. It is true that numerous cases of fading or deterioration ve come under my knowledge, but such have been due, I firmly lieve, to a want of attention to the proper fixation and washing of the des.

In regard to the latter operation, I consider that washing *in running ter for at least a portion of the time is essential*, and, if practicable, the ole of the washing should be so performed. Some of us, unfortutely, have not the convenience of water laid on to our dark rooms, t every one so situated can procure a small plate rack and a pail, and, the slides are placed in the former and "swished" up and down gorously in four or five changes of water, ten minutes or a quarter of hour's soaking being allowed between each change, and then, if, finally, ch plate be separately held for a minute or so under the scullery tap, ry little apprehension of fading, on the score of insufficient washing, ed be entertained. But, at the risk of appearing to be prolix, and to event a very beautiful lantern-slide process from remaining under an merited stigma, I emphatically repeat, that to ensure permanency the tation and washing of the slides must be thoroughly performed.

As this article is mainly addressed to the novice in slide-making, I do ot like to let the opportunity pass of saying a word or two on the ounting of the slides. I would remind my readers that perfection in a ntern slide can only be found when due attention has been paid to both s artistic and technical merit. So far, I have dealt only with the chnical side of the question, but, if due attention be not paid to its tistic aspect, much of the effect due to careful technique will be lost. rtistically considered, the mounting of a slide is a very important atter, and the employment of an unsuitable mask may, from an artistic oint of view, entirely mar the effect of an otherwise perfect slide. ontact printing, in this respect, imposes greater restrictions upon the ide-maker than the alternative method of reducing in the camera, wing to the limitations in the choice of masks. If the picture occupies he entire area of the plate, a mask with a square opening will be found ost suitable, and produce the best effect. Oval, circular, or cushionaped openings should be avoided as far as possible, and a lanternide maker who pays any attention to the artistic treatment of his slides arely uses such shapes nowadays. Whenever the subject permits, I ecommend the adoption of an oblong opening with square corners, and, en when the slide has been printed by contact, the effect upon the reen is often better, for it by no means follows that, because the slide as been so produced, and the entire area of the glass covered with the bject, that it is necessary to show the whole of it in the finished slide. n my own practice I have a number of stout cardboard masks, which are ore easily handled than the thin paper ones, and I try the effect of fferent-shaped openings upon each slide, and select from them the one hich seems best to suit the subject.

A thin well-gummed paper will form the best binding strips; thick aper is unsuitable. The novice will find it easier to cut each strip into ur pieces, and bind each side of the slide separately; a little starch or eak dextrine will make the strips adhere better than if plain water is ed for moistening them. Finally, do not forget the registration dots, nd their proper place is at the top corners of the cover glass.

JOHN A. HODGES, F.R.P.S.

THE EXPLOSIBILITY OF ACETYLENE.

. BREVANS asserts that, if ordinary acetylene from carbide be passed rough a series of three washing flasks containing a solution of sulphate copper, says *The American Journal of Gas Lighting*, there is no effect rceptible within three hours; but, after twelve hours, the first flask ntains a black-brown brilliant precipitate, the quantity of which goes on increasing for as much as eight days. This precipitate explodes on shock, friction, or heating; and it appears to be a mixture of phosphide and silicide of copper, of sulphate of cupro-acetyle, and a variable quantity of acetylide of copper. Its production appears to depend largely on the presence of ammonia in the crude acetylene gas; and it shows that the crude acetylene contains phosphoretted hydrogen and siliciuretted hydrogen. The second flask contains a precipitate which is similar in appearance, but less explosive, and the precipitate in the third flask is not explosive. The explosive precipitate in the first flask will explode, even under water, as, for example, when we try to rub it off the glass with a glass rod.

As to the explosibility of acetylene, there are two opinions: one that there may be metallic acetylides formed, which act as detonators to the acetylene itself, so that acetylene cannot be used with reservoirs which are capable of being attacked by it; the other, that it can only be exploded when mixed with air, and that the influence of the outside explosions, which can set it off, cannot travel far through air. In any case, acetylene, at a pressure not much exceeding that of the atmosphere, is not explosive, though it is explosive at pressures above two atmospheres; so that there is no reason to fear an explosion through flame running back to a reservoir under a very small excess of pressure. Shock alone does not appear to cause explosion of the gas, only of the acetylides. The alleged poisonousness of acetylene—which has not, as yet, given rise to any accident—would appear to be due to the occasional presence of cyanogen compounds, and is not a feature of pure acetylene. The presence of sulphuretted hydrogen in acetylene seems to depend on that of sulphide of aluminium in the carbide of calcium; sulphide of calcium may exist in it without forming this impurity. The blocking of gas jets by acetylene flames seems to be due to the formation of phosphoric acid. If oxygen be not present, acetylene does not attack copper; the oxide must be formed before the acetylide can be produced.

THE CAUSE OF LUMINOSITY IN INCANDESCENT MANTLES

[The Gas World.]

IN the *Journal für Gasbeleuchtung*, No. 43, 1896, Dr. C. Killing gives an account of a series of experiments made by him with a view of finding out the cause of luminosity in incandescent mantles. He says Dr. Westphal found that bare heating of the oxides, as in a platinum crucible, did not result in luminosity, even when oxygen was played upon them; and that Dr. Bunte attributed the luminosity to fineness of structure and refractoriness of the material, together with heat conductivity and rapid assumption of a high temperature, while there were also probably chemical reactions at work. Dr. Killing's experiments have led him to conclude that the luminosity is not due to admixture of oxides, but to the presence, in a state of extremely fine division, of the added oxide in the skeleton, consisting of the main substance, such as thoria. Results of the same order may be obtained by coating a perfectly pure thoria skeleton, which gives scarcely any light, with a very thin skin of ceria, by dipping the thoria mantle into an alcoholic solution of ceria nitrate; but with yttria or erbia laid on in the same way there is no such result. With oxide of uranium, however, in the proportion of about $\frac{1}{4}$ per cent. nitrate mixed with the thorium nitrate in solution, the light is good, not far behind that of a thoria-ceria mantle; but, if the proportion be raised to 1 per cent., the mantle becomes useless.

It appears that only those substances have the required enhancing effect in which there is more than one state of oxidation, and that the action is a catalytic one, in which there is a carrying to, and a liberation of, oxygen. Metallic platinum acts in much the same way as oxide of cerium; and one drop of a 5 per cent. solution of platinum chlorite in 10 c. c. of a 40 per cent. solution of pure thorium nitrate brings the light up to ten times the value it has when pure thorium nitrate is employed alone. In that case the mantle consists of 9$\frac{1}{2}$ grains of thoria and 0·004 grain of platinum; and there can hardly be in this case a molecular mixture, nor could the entire burden of the luminosity be borne by such a small quantity of platinum. When a litre of water is put over a Welsbach burner without a mantle, it gains 21·9° C. in ten minutes; with a pure thoria mantle, 19·7° C.; and, with a luminous thoria-ceria mantle, only 16·2° C. The combustion is perfect in all three cases; so that there is a considerable drain upon the heat in the production of light in Welsbach mantles. If iridium be used instead of platinum, in the author's experiments, the result is still better; the iridium is much less fusible than platinum, and the mantle lasts longer. Gold, osmium, palladium, rhodium, and ruthenium act in a similar way; but osmium and palladium very soon disappear, leaving nothing but the feebly luminous pure thoria.

That there is some catalytic action of the kind described may be seen in a platinum-thoria mantle; if it be hot, when the gas is turned on again, it becomes hotter and glows; this glow begins at the top, and may run half down the mantle before the gas is kindled. A Welsbach mantle occasionally presents a similar phenomenon when everything is hot; but the catalytic action of ceria or of uranium oxide seems to be more marked at higher temperatures, while that of platinum appears at relatively low ones. Many other metals, if they have more than one oxide, act to some extent in a similar manner; chromium, iron, cobalt,

manganese, molybdenum, nickel, vanadium, and tungsten will do this; but only those are useful which can withstand the high temperatures to which they will be exposed. Chromium and pure thoria start almost as bright as a Welsbach mantle, but in three minutes there is a fall off, for chromium evaporates away, and in fifteen minutes it is gone. The utility of ceria, lies, therefore, in its lending itself to this catalytic action, and in its refractoriness; and the platinum metals must also pass through different stages of oxidation and reduction.

The supporting skeleton may consist of other substances than thoria; one consisting of 70 per cent. zirconia and 30 per cent. lime will make a mantle that can be used when the catalytic and refractory material is added to it. The proportion of ceria should not exceed about $1\frac{1}{4}$ per cent., else the lighting power falls off; but that proportion of ceria will make a bright mantle, with a basis of 75 zirconia and $23\frac{3}{4}$ lanthania. Probably no oxide, if perfectly pure, would give any more light than corresponded to its actual temperature; but the chemical action involved through the addition, especially of ceria, aids in the transformation of heat into light. The advantages of thoria as a basis depend upon the porosity and enormous surface of its skeleton, and upon its very low specific heat, which property enables it to take up high temperatures, and is itself a consequence of its high atomic weight.

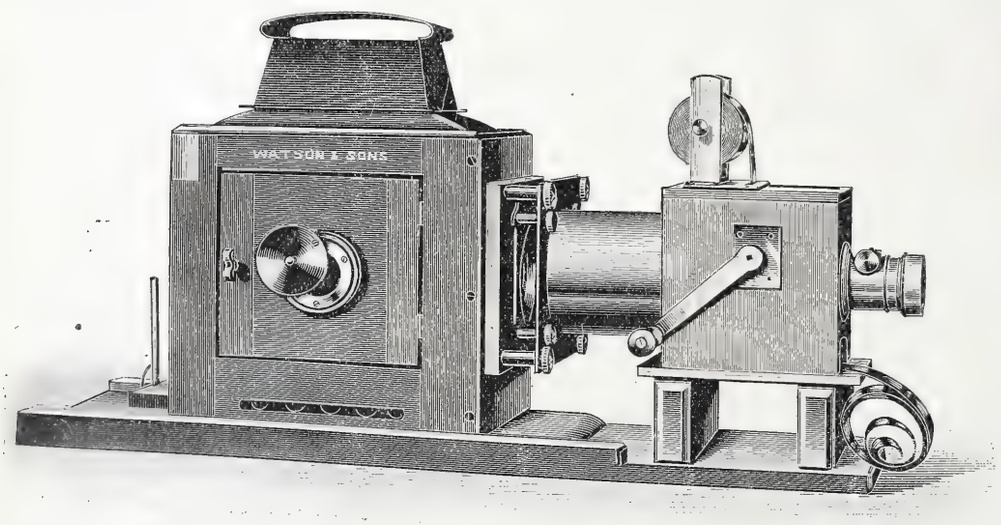
THE MOTORGRAPH.

W. Watson & Sons, 313, High Holborn, W.C.

The principal feature of the Motorgraph—which we briefly described in the Almanac—are, that it is contained in a box, the dimensions of which are $6 \times 4\frac{3}{8} \times 5\frac{1}{2}$, and that it can be attached to any form of lantern. It is designed for photographing as well as for projecting. It is steady, and free from vibration. The shutter permits of an exceptional amount of light being passed. The sprocket wheel fits the "Edison" perforations, this gauge being the universally adopted one.

The instructions for working are as follows:—

To attach it to an ordinary magic lantern, the front lens of the lantern must be removed, and the Motorgraph placed close to the front tube, from which the lens has been detached. It will be well that the lantern



be mounted upon a baseboard, having two fixed blocks at one end, on which the Motorgraph can be fixed to the exact optical centre of the lantern.

To insert the film, the film is placed upon the centre pin as shown in illustration, and is pushed through the slot in the top of the machine. While this is being done, a flap, which is held in position by a spring, must be pulled back, the film passing between this flap and the fixed metal strip. The film should be gently urged downwards until it reaches the sprocket wheel; the spring flap is then closed, and the handle turned until the film comes through the front of the machine. The position of the picture can then be adjusted by again holding back the spring flap.

CONDENSERS FOR COILS.

Those of your readers who "go in for" X-ray work may find it to their advantage, as I do, to have by them an extra or spare condenser.

A condenser is, of course, a very important part of a spark coil; its use is, to quote Professor Thompson, "firstly to make the break of circuit more sudden by preventing the spark of the 'extra current' (due to self-induction in the primary circuit) from leaping across the interruptor; and, secondly, to store up the electricity of this self-induced extra current, in order that, when circuit is again made, the current shall attain its full strength gradually, instead of suddenly, thereby causing the inductive action in the secondary circuit at 'make' to be comparatively feeble."

Now, of course, if a coil is bought from a first-class maker—dealers do not count for much here, as, naturally, they cannot exercise any supervision—it will be fitted with a good condenser, made and adjusted to give the best results; but there are plenty on the market, or were—for I suppose the big demand for coils early in 1896 cleared them off pretty well—not so perfectly fitted in this respect as they might be.

It is, in my experience, not at all unusual that a coil gives a lesser *spark* than it should for its size and weight, maybe, as I have proved, because the condenser fitted to it is not large enough.

A condenser is liable to break down as the result of a too heavy current or imperfect insulation, and, if this does happen, one is apt to "get left," that is to say, if a spare condenser be not at hand. If a coil shows a diminished spark at the secondary terminals, and an increased "flare up" at the contact break, injury to the condenser is very likely the cause. In such a case the old and suspected one is disconnected and removed, and the new or spare one coupled up. If all goes right now we simply, at our leisure, examine and *re*make the old or faulty condenser, finding, upon taking it to pieces and examining each sheet carefully, some pinhole, or black perforation, denoting the effects of a badly insulated or imperfect spot. Here I may remark that, if the condenser gets "pierced" by a spark from the coil, owing to defective insulation or other fault, the effect is to "short circuit" the sheets of tinfoil, and the condenser becomes merely a branch of the primary circuit, of no use whatever, and the sooner it is cut adrift the better.

I greatly prefer this essential part of a coil to be altogether separate from the coil itself, that is to say, in a separate case. I have two such cases, one containing 75, the other 150, layers of foil. They have been carefully made and encased in mahogany boxes, with outside terminals ready for attachment to the break-pillar and spring of the coil used.

The best paper for use in making a condenser is *papier rive*, plain and unsalted; but, as a rule, you will only get this from makers of, or big dealers in (such as Marion & Co.), sensitised papers. But bank-post note paper will do. Buy ten quires of this, and out of that we shall be able to select 180 or so sheets free from pinholes and flaws, examining each sheet for these by a good gas light. The waxing of these sheets need not be a long difficult, or dirty business; but it may be a dangerous matter if you use too much heat or get too near the fire. The best receptacle to use is a block-tin water bath, say a tin dish 12×10, separated from the source of heat (or rather from the flame) by a jacket of water, or sand may be used in place of water.

Place the selected papers in this tin and cover and surround them with paraffin wax cut into shreds or roughly broken up in a mortar; one and a half pounds of wax will be wanted.

Now, upon some day when you can have sole possession of the kitchen, and *a good fire*, together with the help of a friend, start to melt the wax, the source of heat being, by preference, a gas stove. When completely melted, and the sheets of paper are seen to be saturated with wax, remove the bath to a convenient and steady support in front of the fire; have a table drawn up close, upon which may be laid a piece of glass, say 24×18; great care is required to keep the waxed sheets free of dust or any particles of grit.

Now one operator seats himself in front of the dish, and lifts out by one corner, with thumb and finger of each hand, the waxed sheets one at a time, holds them up in this way in front of the fire, and lets them drain over the dish. This is to get rid of superfluous wax, and secure an even surface, not thick at one end and thick at the other, with a few lumps in the middle. Your assistant takes them from you in a similar manner, lays them down on the glass plate (they will set almost immediately), and removes them, by which time other two are ready; and so quickly is it done that in an hour and a half the whole number of sheets will be waxed and heaped up; not only this, but there need be no mess whatever—a newspaper spead over the floor will take up any stray drop of wax, and the fingers will be scarcely soiled.

I would never again use a photographic (porcelain) dish. If one cracks or breaks, as it did with me once, there is considerable danger of setting the house on fire. The tin and water, or sand bath, is absolutely safe.

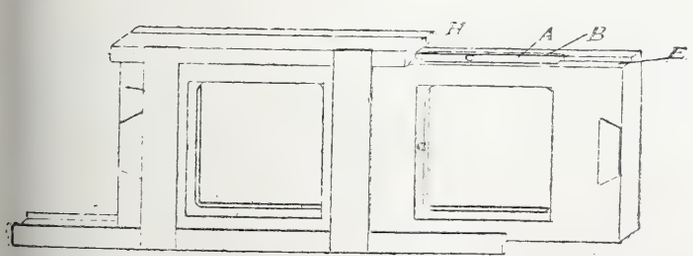
About three and a half pounds of tinfoil, 14×11, and twelve or so sheets to the pound, will be wanted. This quantity will give 150 pieces, $7 \times 5\frac{1}{2}$, and the requisite number of strips, $3\frac{1}{2} \times 1$. The cost will be about 1*s.* 6*d.* per pound. I prefer to use pieces $7\frac{1}{2} \times 5$, in the centre of insulating paper $9\frac{1}{2} \times 7$, and strips to right and left alternately.

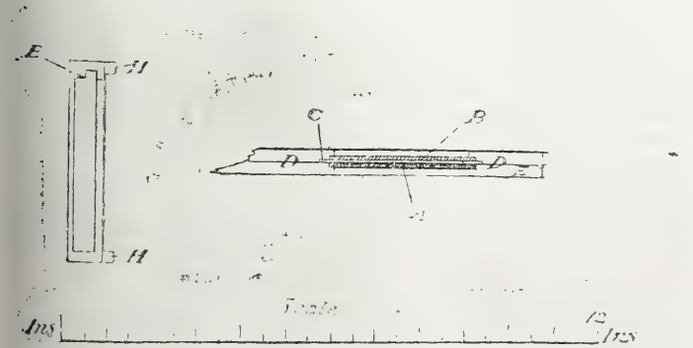
Having cut down the waxed papers to $9\frac{1}{2} \times 7$, select two pieces of thin seasoned mahogany, and well baste them with melted paraffin wax, or

nellac varnish—the pieces should measure 12 × 7. At each end of these ieces of wood, bore holes three quarters of an inch from the ends, and in- ert a brass bolt (broad and flat-headed, such as used sometimes with tripod eads), and fitted with butterfly nut. Take one piece of wood, insert a olt at each end, letting them stick up. Now proceed to build up the ondenser; firstly, three or four layers of waxed paper, then a sheet of ›il, which, if 7½ × 5, will leave a clear margin of one inch all round; ow one foil strip to the *right*, it may project one inch beyond the edge of aper and clear of the bolt; then a second sheet of paper, a second sheet of ›il, and a strip, this time to the *left;* a third sheet of paper, tin foil, and trip to the right, and so on, right and left alternately till the pile is built p, finishing as we commenced with three or four layers of waxed paper. Jpon the top should now be placed the second piece of wood, it should t neatly, and, the bolts passing through, the nuts can be screwed on, nd a gentle very even pressure brought to bear on the pile, which is hus kept in place. Some careful arrangement of this kind is a great ielp, because the waxed papers, foils, and strips are very light, and shift .bout unaccountably at the least touch. Broad tape may be passed ound the sides in order to secure the apparatus flat in that direction if equired; *weight* may also be used to get the whole pile well and evenly ›ressed together. The projecting strips on each side should number eventy-five, they should be now gathered and pressed together; by ising a small brass washer and carefully drilling a hole through the ›unch, we may insert a screw terminal and thus make a good binding ınd connexion; these terminals to be connected with others on the out- ide of case by a short length of wire. A condenser made in this way is easily taken to pieces for examination or repair, and may be coupled up vith another for use with a larger coil. A neat case, in which it will it without shaking about, should be made for it, terminals or binding ›crews fitted outside, together with a brass handle, thus completing a ıseful piece of apparatus. D. D.

SLIDE-CARRIERS FOR TINTING SLIDES DURING PROJECTION.

Mr. A. E. Bingemann, who patented this idea, says: "Instead of the single slot or mortise which is ordinarily cut in magic-lantern slide-carriers to receive the slide, I make two slots or mortises, or places for the magic-lantern slides to slip into, A and B, one directly behind the other; and I provide the back slot, B, or mortise (that which would come nearest the condensing lens of a lantern when in use) with a slide suitably tinted to give a morning, noon, evening, or other desired effect to the views, statuary, or photograph intended to be projected. The tinter slide being placed in the back slot, B, or mortise, upside down in similar manner to ordinary magic-lantern slides, and the slide to be projected is placed in the front slot or mortise, A; and, as the illuminant passes





through the tinter, it carries the shades of the colouring through the slide placed in front of it to the magic-lantern screen, thus tinting or colouring the slide projected.

"And, as in this manner the tinting medium is nearer the lantern condensing lens than the lantern slide, it does not injure the sharpness of the latter, when this is projected on the lantern screen, as does the means now ordinarily employed, *i.e.*, that of tinting in the nozzle of the front lens.

"I find it convenient to make the partition, C, dividing the two mortises, to draw out, by running it in a groove formed each side, D, and about the middle of a double and suitably sized mortise to accommodate two magic lantern slides, in which case, partitions, C, made of metal having openings carefully cut, circular, or square to suit requirements, can be inserted or changed, and so form a mask suitable to the lantern slide to be projected. I also cut down the top, E, or mouth of the front mortise, or slot, A, so as to make the mouth of the back mortise, B, rise slightly above the front one, as it thus avoids confusion of the two apertures when in work in darkness.

"And I make two longitudinal strips of wood, H, H, or metal, of the same thickness, the length and breadth to suit the various carriers it is applied to. I fasten these strips, one across the top and one across the bottom of the frame portion of my lantern slide-carrier, on that side which would come nearest the condensing lens of the lantern, when the carrier is in use, thus forming a gap between the slide-carrier frame and the lantern itself, next the condenser, which gap should be of sufficient width to allow two glasses for colouring to slide in together. This gap can be also formed, during the manufacture of lantern-carriers, by shaping the top and bottom parts of the frame to project sufficiently on that side of them which would come nearest the condenser when in use, and thus form a suitable gap. For this gap I make suitable tinted or coloured glasses, cutting them to size of gap, so as to allow these glasses to slide in easily. I insert these glasses (one or two) from the side, upside down, and thus I tint the lantern slide, which is held in mortise in front during projection, without injuring its sharpness on the screen.

"I obtain numerous effects of a pleasing nature by using one or two suitably tinted glasses in this gap, without the likelihood of breaking them by the heat of the illuminant used in the lantern. This gap, formed between the carrrier frame and the lantern, also forms a ventilation between the condensing lens and the lantern slide, thus reducing the likelihood of burning a lantern slide, as is sometimes now the case from the great heat given off by the condenser during an exhibition.

"I make good tinters for ordinary use with my improved carrier by selecting a piece of thin clear glass, of a suitable size; this I tint on one side, as desirable for a certain effect; then I place a mask (one having a large opening) on this tinted side. I then select a thin cover glass and bind together. The tinter used at the back of the carrier frame may be plain coloured glasses cut to size of gap, or the oblong tinted glasses ordinarily used for sunrise and other effects in lanterns."

The claims are:—

"1. The combination of double mortises or slots, one placed directly behind the other, and separated by a metal, or wooden, mask, C, removable in a groove, D, and applied to tinting slides in lantern-carriers.

"2. The back mortise, B, or slot used for the purpose of holding glass tinters, for the purpose of tinting a slide held in the front mortise, A, of magic-lantern carriers.

"3. The raising of the mouth of the back slot or mortise above that of the front one, to better assist manipulation of the two slots in darkness.

"4. The two longitudinal strips, H, H, fixed one at the top and one at the bottom of that side of the lantern-carrier frame which comes nearest the condenser when in use, and there forming a gap for tinting or for ventilation.

"5. The projection of the top and bottom part of the frame, H, H, of magic-lantern carriers, for the purpose of forming there on the side which would come against or nearest the condenser when in use a gap for tinting lantern slides during projection or for ventilation."

PANORAMIC STEREOSCOPES.

Dr. L. Jeffery states that by this invention he is enabled to exhibit in a stereoscope a continuously moving panoramic view.

Two similar series of pictures, each forming a continuous panorama, are mounted upon two endless bands, to which a slow continuously revolving motion in the same direction can be given.

Each endless band is made to pass around a drum, by which it can be revolved, and also around two parallel guide rollers at a distance apart.

The two guide rollers of one band and the two guide rollers of the other, are all in one plane and parallel with one another.

A portion of each band, stretched flat between two guide rollers, can thus be exhibited side by side with a similar portion of the other band, just in the same way as the two pictures are exhibited side by side on an ordinary stereoscopic slide, and can be viewed simultaneously by looking through the two lenses or eyepieces of the instrument, just in the same way as though an ordinary stereoscopic slide were being used.

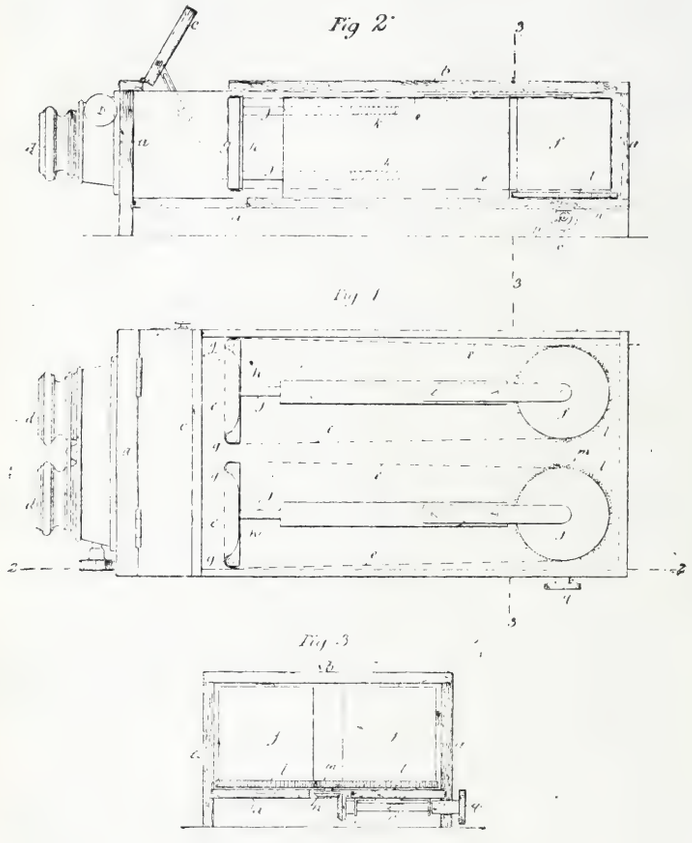
The two drums used for giving a revolving motion to the two endless bands may be made to revolve simultaneously and at equal speeds, by toothed wheels upon them gearing with opposite sides of a toothed pinion driven in any convenient manner.

Fig. 1 is a plan of a stereoscope constructed according to this invention, the cover, *b*, being removed.

Figs. 2 and 3 are vertical sections on the lines 2—2 and 3—3 fig. 1, respectively.

a is the case; *b*, the cover; *c*, a hinged mirror throwing light into the interior, and *d*, the eyepieces.

e are the endless bands carrying the views they pass round the drums, *f*,



and guide rollers, *g*, the latter being mounted on plates, *h*, carried by spindles, *j*, pressed outward by the springs, *k*, so that the bands are kept in tension. The drums, *f*, are mounted on toothed wheels, *l*, gearing with the pinion, *m*, to which is fixed the bevel pinion, *n*, gearing with the bevel pinion, *o*, on the shaft, *p*, which also carries a handle, *q*.

The claims are for

1. The combination with a stereoscope of means for continuously moving two similar series of pictures each forming a continuous panorama.

2. Stereoscopes substantially as described and shown in the drawings.

A New Use for Stereoscopic Effects.—Mr. C. Francis Jenkins writes in the *Photographic Times*: There are two principal things the credit for which belongs exclusively to the amateur photographer, viz., on the one hand, the ruination of millions of dry plates per annum, and, on the other hand, the introduction of invaluable improvements and a multiplicity of novelties. The writer has added his share to both these conditions, and, while he deplores the former, takes comfort from the fact that it is about the only road to the successful accomplishment of the latter. One of the latest is the production of stereoscopic photographs by means of a single lens. But you say this is not new. To be sure it is not new; but has it ever occurred to any one that, if the angle at the object thus stereoscopically photographed is made larger or increased, the object maintains its rotundity, but appears to diminish in size in direct proportion? Take, for example, the photograph of the front of the national Capitol. When viewed through a stereoscopic instrument, it appears as a miniature model, perfect in every detail and in proportion, except, possibly, perspective. But, when the photographs are made in an inverse manner, inverse results are produced. For instance, pictures taken of a clay model with an angle (at the model) *less* than that of natural eyes produce an impression that the object is much larger than it really is, thus enabling artists, architects, &c., to exhibit to prospective buyers pictures which, when viewed through a stereoscope, convey an accurate and lifelike appearance of the statue or structure as it will appear when erected.

Spectroscopy.—Although spectroscopic work never came quite to a stand, there elapsed a decennium before a real new impulse can be signalised, which still continues and daily bears new important fruits. The main cause of this impulse may be sought in two circumstances; the construction of Rowland's gratings, especially the concave gratings and the following applications of photography. Gratings existed since the beginning of the century, when they were introduced by Fraunhofer, says Mr. H. Kayser in the *Chemical News*, but they were much too small, and therefore feebly illuminating, too inaccurately divided, and, finally, much too expensive to compete with prism apparatus. But, on the one hand, prisms were used, and on the other the visible part of the spectrum, which was best known by ocular inspection, could not be photographed until H. W. Vogel had rendered his principle of optical sensitiveness practically available by the invention of the plates sensible to colours (1884). The old spectrum analysis had been wrecked on the circumstance that the spectra of the several chemical elements could not be determined with sufficient accuracy and completeness. We had scarcely advanced so far as to determine in the visible part the wave-lengths of the main lines to an Angström unit (A. U. = 1 ten-millionth mm.). But as often a dozen lines of different elements fall within an A.U., it was found impossible to ascertain the chemical constituents of a substance from its spectral lines. The first condition for a faithful development was, consequently, a more accurate determination of the spectra of the elements. This task was undertaken since 1878 by Liveing and Dewar, who, for the first time, obtained a true insight into the ultra-violet spectra of some elements, whereby they evaporated the substance in the electric arc. Hartley and Adeney carried out similar measurements for the spark spectra; but, excellent as were these determinations in comparison with those of an earlier date, they were insufficient, as they were not executed with Rowland's gratings; hence the dispersion did not suffice to attain the accuracy required. In most cases we may indicate a line as known when its wave-length is certain as far as 0·1 A. U. but, after all, this does not suffice, and for modern spectrum measurements we must consider 0·01 the limit of accuracy to be aimed at. This, however, can be attained only by such great dispersions as Rowland's gratings admit of, and hence Rowland was the first to publish measurements in which the $\frac{1}{1000}$ of an A. U. was given. They referred to the solar spectrum, and appeared with the splendid atlas of the solar spectrum which Rowland obtained in a purely photographic manner, and published in 1889. A systematic measurement of the spectra of the elements, photographed by means of Rowland's concave grating, and in which an accuracy of at least some hundredths of an A. U. was attained, was undertaken in 1887 by Kayser and Runge. Hitherto only the arc spectra of the alkalies, the alkaline earths, of Fe, Cu, Au, Ag, Zn, Cd, Hg, Al, Ir, Tl, As, Pb, Bi, Sn, Sb have appeared, but other elements are to follow. More accurate measurements of limited parts of some spectra have also been published by Hasselberg and Rowland.

Lantern Slides.—There is a widespread opinion that slides made in the camera are, as a rule, of finer quality than those made by contact printing. This opinion, says Mr. C. H. Bothamley, in *Anthony's Annual*, is certainly not without some foundation, and my own practice is to make slides in a camera, even from quarter-plate negatives. The apparatus needed is only a quarter-plate or 3¼ × 3¼ camera, a deal board to serve as a baseboard and support, and at the end a support for the negative. Illumination of the latter is obtained by simply pointing the apparatus towards the clear sky, and extraneous light is prevented from entering the lens by placing a black cloth over the space between the negative and the camera. Any shortcoming of contact slides that arises purely from the fact that they have been made by contact is probably to be attributed to a "creeping" or scattering of the divergent rays of light from the flame used to make the exposure, and this cause will be more active the nearer the printing frame is held to the flame. If the old practice were adopted of placing the printing frame at the bottom of a box about two feet long, so that the negative is illuminated by what is practically parallel light, it is probable that there would be no appreciable difference in quality between contact-made slides and camera-made slides, other conditions being equal. A very large proportion of the slides that are exhibited are very far from being pleasing, not to say artistic, because of their "soot and whitewash" character; that is to say, the contrasts are much too strong, the shadows are far too dark and there is an absence of detail in the high lights. The result is a spotty effect, fatal to that breadth which is an essential feature of a real picture. The best way of avoiding this evil is to take care that the negatives from which the slides are made are fully exposed and not too dense, and that the lantern-slide plate is also sufficiently exposed. In order to get a perfect slide, the exposure should be such that detail in the highest lights is obtained before the shadows have clogged up and lost their transparency. On the other hand, if the slide is to be clear and not muddy, it is equally important not to give an excessive exposure, and it is of still greater importance to develop in such a way as to avoid the production of general fog, especially if the effect of sunshine is wanted. Care has also to be taken in judging the opacity and stopping development at the right time. Slides to be used with an oil lamp may be distinctly thinner than those to be used with the lime light, and these in their turn thinner than those to be used with an electric light.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*February* 5, 1897.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

AMONGST the Patent Specifications recently published is one for a "process and furnace installation for the continuous process of production of a non-exploding mechanical admixture of oxygen and hydrogen."

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THE wave-length of Röntgen rays, says a foreign contemporary, has been ascertained by Dr. Fromm, of Munich, at fourteen-millionths of a millimetre, that is about seventy-five times smaller than the smallest wave-length for light. This determination was based upon interference phenomena observed by Dr. Fromm.

* * * * *

A "NEW" lamp shade, invented by A. Von Kozlowski, says the *Gewerbe Zeitung*, Vienna, is made hollow, to be filled with a suitable liquid, such as a very dilute solution of sulphate of copper with a slight addition of ammonia. This shade absorbs the heat and reflects the light, at the same time giving it an agreeable colour.

* * * * *

THE method by which M. Raoul Pictet purifies acetylene is given in a recent issue of the *Gas World*. It is based upon the failure of certain chemical reactions when the material is exposed to low temperatures. At—50° C. (—58° F.) sulphuric acid does not act upon acetylene, but it does act upon the impurities usually found in that gas when made from calcium carbide; and therefore the gas, as it is formed from the carbide, is passed through that acid, which retains the impurities. The purified acetylene is then more manageable and more easily liquefied, while its obnoxious odour, its liability to spontaneous ignition (through the presence of phosphuretted hydrogen), and its action upon metals are very largely got rid of, while the light produced is intensely white and bright.

* * * * *

THE languid attention paid to lantern matters by English photographic societies finds no imitation in, at least, one New York Society, the Camera Club, if we may judge from the following passage in the last number of its *Journal:* "During the months of November and December," we read, "there have been more than 700 slides tested for members at the regular Wednesday test nights. While not all of these have been available for exhibitions, they have furnished the members with instruction and entertainment, and have contributed to make the test nights, in some measure, a substitute for the former regular lantern exhibitions on the fourth Friday of the month. A cordial feeling of sociability prevails on these occasions, smoking is moderately indulged in, and it is by the free interchange of opinions and experiences in such intercourse that we may expect to advance in our art and in friendship with each other. We have lately gained several new members, who decided to join the Club after a visit to the rooms on a test night. It is a good plan, therefore, to introduce on any Wednesday evening such of our friends who might make desirable members."

* * * * *

AGAIN, with regard to a Lantern-slide Exhibition of members' work, the Club *Journal* says: "It was in the record of the Manifestations of Natural Phenomena that the most original and curious work was seen, and Messrs. Post, Stieglitz, Fraser, Montant, Simpson, Bridgham, and Reid combined to produce more than fifty slides of the most remarkable effects ever photographed. We had wind and rain, mist and haze, sunlight and moonlight, snow and ice, and all kinds of lightning. We saw a tempest lashing a lake into fury, the trees on the shore bending under the gale; we saw rain coming down in sheets sharply defined against houses and foliage; we saw moonlight masquerading as daylight, and sunlight with an effect of night; we saw the electric lights glistening in the great hotels across the Central Park lake, while the foreground snow was illuminated by the rays of the moon; we saw snow descend in flakes in the busy streets of New York; we saw Niagara in the icy chains of the wonderful frost of February, 1896. The last slides shown were the pictures taken at night by Mr. Fraser in the midst of snow, or rain, or fog. In these the very conditions operating against successful photography were triumphantly turned into features of pictorial beauty. It seemed as if the fog, or rain, or snow, was the one element that could not be taken away without destroying artistic unity."

* * * * *

THIS is, indeed, pleasant reading, indicative of an amount of assiduity and attention bestowed upon the cultivation of the art of lantern-slide making which positively makes us blush when we think of the apathy of most English societies towards this branch of work.

LANTERN MEMS.

WHOEVER turns out to be the Jack Horner to pull out the plums from the pie of colour photography, one name will always be honourably associated with serious investigations in connexion with this subject. That name is Mr. Frederic Ives. The interest attached to the krömskop and kromograms was made manifest the other evening, when a large audience attended at Grafton-street, by special invitation, to hear a descriptive account of the invention that Mr. Ives has worked at so patiently and thoroughly to perfect.

* * * * *

GREAT ingenuity was displayed in the construction of the apparatus, both for projection and visual observation, and the experiments

to show how the various colours of the spectrum could be isolated and analysed were well thought out. The electric light was requisitioned for all the apparatus except one of the krömskops, which was illuminated by an incandescent gas lamp. If the Exhibition continues open at the St. George's Gallery, in Grafton-street, during February, I advise all who have not yet seen these beautiful examples of stereoscopic photographs in colour to do so without delay.

* * * * *

I HAVE a vivid recollection of the charming effect of the coalescing of the three-coloured stereograms in the krömskop, particularly in the subjects of fruit and flowers, coloured vases, an iridescent bottle, sweets and confections in a fancy box, while similar subjects, as transparencies projected by three objectives on the screen, and by means of prisms made to superimpose, were most attractive. When, however, a landscape shown was examined, it was felt that the ideal had not been reached; but, as it was explained that the photographs were taken late in the year, the future efforts in this direction may be more successful.

* * * * *

I FEAR, however, from the fact that the camera to take these kromograms has not yet been put on the market, that greater skill is required, or more attention must be paid to detail than can be expected from the average amateur photographer, and for the present, purchasers of the krömskop will have to be content to purchase the subjects published now, and from time to time, by the Photochromoscope Syndicate, Limited.

* * * * *

A MOST important announcement has just been made to the members of the Society of Arts through their journal by Sir Henry Trueman Wood, who, in a letter published in the issue of January 29, says: "I am anxious to make, at all events, a preliminary announcement of a very remarkable process for producing photographs in colours which was brought to my notice the other day. To say that it enables photographs to be produced in natural colours would not perhaps be precisely true, since colouring media are employed; but the result of the process is a photograph in the colours of nature, a faithful reproduction in colour of the object photographed, and so, for all practical purposes, it may be said that the long-sought-for object of photographic research, photography in colours, has actually been obtained."

* * * * *

IT is very remarkable that this announcement should be made soon after the results of Mr. Bennetto's work were seen and described by me, and is another instance of how investigators closely follow in one another's footsteps to achieve the desired result, and yet, in all probability, without the slightest knowledge of what the other is doing—in fact, produce results closely resembling each other quite independently. Having as yet not seen the positives described by Sir Henry Trueman Wood, I can only comment on the process from description; bnt, as it is stated in the above extract that colouring media are employed, and Mr. Bennetto's assurance is given as to his rocess that *no* colouring media, dye, or pigment of any kind are used, but simply photographic and chemical development, the earlier announced invention must be awarded the premier position, if all can be substantiated when the time comes for submitting the results, and announcing the process to scientific and photographic experts.

* * * * *

IN the interest of science, it would have been well if Mr. Bennetto could have made a practical demonstration of his process; but, as I know the acquisition of his invention by financiers was not of his seeking, he can hardly be blamed for "taking the tide at the flood," and now the initiative must be taken by those who have the monetary interest in the development of the process. Certain it is, to my mind, that for results, as exhibited on the screen in my presence, it will be a difficult matter to surpass and, as these can be produced by *any* photographic operator with no more trouble than exposing, developing, and printing an ordinary collodion negative and lantern transparency, there should be a good time coming for those who take an interest in photographic transparencies.

As the Editor will, no doubt, comment on the invention referred to by Sir Henry Wood in its photographic aspect, I shall only compliment M. Villedieu Chassagne, of Paris, on his accomplishment, and express the hope that he will be able to supply some of the secret solution, and the three other solutions of red, green, and blue, so that photographers and lanternists may have an opportunity of obtaining and projecting the colour photography slides, which, from the description given, seem so easy of attainment. No doubt, details of time of exposure necessary and other particulars will shortly be forthcoming, especially as such well-known names as Captain Abney, Professor Thomson, and Mr. Herbert Jackson are stated to have witnessed the demonstration at King's College, and been impressed "by the remarkable nature of the process and its results."

* * * * *

THE additions to the number of apparatus for taking and projecting animated photographs are weekly increasing, and I recently saw a film of great clearness and large size that will not require to be perforated to be shown in the apparatus, which is one of French manufacture. The size of the film is such that the pictures are each forty-five mm. by thirty-three mm., and a novel part of the invention is such that the film moves horizontally, instead of vertically as all I have previously seen do. The largest-size English film picture I have seen in commercial apparatus is thirty-two mm. by twenty-five mm., but in the original apparatus patented—viz. Croft's—the films were nearly three inches square, and the exposures made at the rate of seven to twelve per second. It seems a great pity that this machine, on which so much time and thought were spent, should have been allowed to lapse, primarily on account of the death of the inventor; and, secondly, that no business man was sufficiently enterprising at the time to buy the patent rights from the widow or executors, and spend the time and money necessary to bring it to perfection. When one thinks of the money made out of the cinematograph and animatograph in 1896, one feels that, given the necessary "push," the man that had acquired Croft's patent at the end of the eighties or early in the nineties would have had "a good thing."

G. R. BAKER.

"EFFECTS" WITHOUT CARRIERS.

A FEW years ago, before the craze for cheapness in everything connected with the lantern fairly set in, every slide which was intended to be projected by means of a biunial or triple lantern was enclosed in a mahogany frame. But in those days the phrase, "dissolving views," meant more than it does now. When a lecture was said to be illustrated by dissolving views, it was generally understood that a number of "effects" would be included in the show. These, more often than not, consisted merely of scenes of a "truly rural" nature, which might be well described by the line from the nursery rhymes, "All on a summer's day," followed by slides representative of ditto by night, and ditto in winter, and so on. It is true that the pictures were generally more or less crude in conception and execution, but they always contained the germs of what occasionally rose to the height of a really beautiful transformation.

It is hardly necessary to point out the reason for this extensive framing of the slides which were intended for this kind of business. The very first requirement in the production of effects, in which two or more different slides take part, is that corresponding portions on each shall be in exact register upon the screen, and the only satisfactory means of bringing about this result was to mount each little picture in a well made wooden frame, and subsequently to trim the edges of that frame by means of a carpenter's plane, so as to adjust each picture exactly to its *confrères*, actually testing it in the lantern between every alteration.

But now it has become the fashion, for many reasons, to do away with these heavy, bulky, and expensive frames, and to use the glass slides without any other mounting than the paper binding which holds the component glasses together. Since it is not practicable to trim the edges of the glass itself, effect pictures have had to be abolished. A few of the more careful workers, of course, still adhere to the old-fashioned carriers and they are well able to prove to any whom it may concern that the art of producing beautiful effects upon the lantern screen by means of two or more differently treated slides of one subject is by no means a forgotten one as far as they are individually concerned. Many of the old-established dealers, too, who have been able to keep up fair prices in

spite of the present-day tendency to starvation undercutting, have thousands of these carefully produced and well-framed slides in stock; but I don't think anybody buys them. And yet one or two good effects in a lecture, if properly carried out, are a pleasant relief to the monotony of a series of illustrative views, be they never so charmingly arranged or wisely introduced.

I am by no means altogether lamenting the decay of effect pictures. Even in their palmiest days, when there were people who were able and willing to spend a little time and money on their lantern arrangements, the results in this direction were more often than not of a most execrable description, redolent of the evil that is wrought by want of taste instead of want of heart. In these days, when the improvement in taste is, to say the least of it, questionable, and when quality has, in all departments of lantern work, been blatantly sacrificed to cheapness, in order to propitiate the growing class of curate-lecturers and pictorially persuasive parsons, any attempts at "effects" could hardly fail to produce results that would be "horrible, most horrible."

But, on the other hand, while the lantern and all that appertains thereunto, or, rather, one branch of the same, has been degraded to the level of the tambourine and the cheap harmonium in the interests of the noisier temperance advocates and the purveyors of popular religion, another branch has been steadily, and, as might be supposed, less ostentatiously, progressing. It has fallen into the hands of good photographers, who recognise its capabilities as a means of exhibiting their pictures, and they are a class of men to whom the production of effects is but a very secondary consideration. There are, undoubtedly, many of these who would not hesitate to spend time, and trouble, and patience in the accomplishment of beautiful effects with their double lanterns, and they are just the men who would be possessed of the ability to do it, and to do it well; but, to introduce one such trick into a set of slides seems to necessitate that the whole series shall be uniformly framed, or that the sliding carriers shall be removed from the lanterns, and the stops adjusted in the middle of an exhibition in order that the special slides may be introduced. Naturally, few consider that the game is worth the candle.

But there is a means by which all the slides constituting an effect may be produced in exact register with one another without the use of frames, which only involves a little extra care in the printing of the transparencies from the negative. Take the simplest case of a landscape, say, shown first in all the glory of the noonday sun, and then, with the shades of night falling fast—very fast—until nought but the silvery moon illumines the ghostly scene, and so on. For an illusion of this very simple description you merely require two slides printed from the one negative—one of them over-printed and over-developed—and you rely upon artful colouring to do the rest. But the slides *must* be in accurate register, and there's the rub.

The idea of the dodge now to be described is to print the two pictures in exactly similar positions on their respective glasses, so as to obviate all necessity for that subsequent trimming for which the wooden frames were employed. Suppose the negative to be printed to be of quarter-plate size. Take a piece of quarter-inch mahogany, or other suitable wood, about a foot square, and in the centre of the board cut a hole a little larger than the standard three-and-a-quarter slide. To one side of the board attach suitable clips, so arranged that the negative may be placed in any required position over the hole and tightly held there. In the inside edges of the opening, and to the top and left-hand side, attach small flat springs in such a manner that they will press upon those two edges of a lantern plate placed in the opening, and force it down into the opposite corner. The pressure of one finger will be sufficient to hold the slide in contact with the negative during the printing operation, while, if there be any fear of fogging from extraneous light reaching the plate from the back, a piece of black velvet hung over the back of the frame will obviate that danger. It is obvious that, provided the position of the negative be not shifted in the intervals between successive exposures, any number of slides may be printed from it, and the image on each will be in exactly the same position with respect to the bottom and right-hand sides, even though the size of the glass plate may vary a little. Given two slides produced in this manner, and suitably exposed and coloured to represent day and night effects respectively, it is only necessary to have a couple of carriers so constructed, with springs arranged as in the printing device just described, to ensure that the pictures shall be in perfect register on the screen when once the two lanterns have been properly adjusted to one another.

But, it may be urged, it is only in the production of the simplest and crudest effects that the several slides are printed from the one negative. How about those cases, of far more interest to the photographer, such as summer and winter scenes, where a series of different negatives are depended upon, and with which the illusive artfulness of colour has no part? Well, that only involves an amplification of the same idea. First of all, print what may be termed a "guide slide," say, from the "summer" negative, and develop, fix, wash, and dry it in the usual manner. If it be altogether satisfactory, well and good, it will do for one of the series; if not, it will still serve its primary purpose, and a fresh one may be produced for actual exhibition. Place this finished slide face downwards in the opening of the printing device, which is afterwards to be occupied by the sensitive plate, and, holding the frame up to the light, adjust one of the negatives carefully to it, just as if it were a piece of printing-out paper that had been insufficiently exposed and you were desirous of completing the operation. When the two are in really accurate register, fix the negative firmly in its position and replace the slide by an unexposed lantern plate. After exposure in the ordinary manner, remove both plate and original, and proceed to adjust negative number two by means of the guide slide, in exactly the same manner as before, and expose the second slide; and so on through spring, summer, autumn, and winter, or as many as the series may consist of, taking care that the negatives are always placed in the printing device right way up. Upon trial in the lantern, in the properly bushed-up carriers, with the springs arranged just as in the special printing frame, every slide will be found in accurate register, and the transition from one to another, with the aid of the dissolving tap, should be as easy and as free from any suspicion of double image as the most carefully adjusted slides in wooden carriers.

It is unnecessary to enter into any details of the construction of the special carriers which will be necessary to properly exhibit effect slides prepared in this manner, or to further describe the special printing frame with which they are produced. The lesser details of both can be easily worked out by any one who has a mind to try this dodge. The idea is simply that in each case the glass plate shall be pressed quite home on two proximate sides, so that different slides constituting one effect shall have corresponding portions of the picture in exactly the same position with respect to these two slides. Then, when two pictures of a pair have been registered in the biunial lanterns, every other pair will be in accurate register too. In the mean time, ordinary slides, which are not meant to pair, will go into these same carriers, so that there is no necessity to make any change in the general arrangements when a particular effect is to be shown.

Under these circumstances, many photographers who are in possession of the necessary double or triple lantern may find it worth while to give this plan a trial, for it does not involve any outlay to speak of, while, with care and the full exercise of that all-important good taste, without which all such attempts are worse than nothing, they will find that results may be produced that will well repay them for all the trouble and time expended in their production.

CECIL M. HEPWORTH.

THE ENLARGEMENT OF NEGATIVES.

I HAVE been extremely interested lately in noting evidences that there are at all events a few amateurs with some ambition towards the making of large negatives, and, as I have had some years' experience of this class of work, a few remarks may be useful to those who may be doubtful as to their prospects of success in this department of photographic practice, or those who may be making small headway.

I know, as a matter of fact, that inexperienced workers do make, in all good faith, attempts mostly disastrous as enlargements; the failures can usually be readily diagnosed by an expert. Bad, faulty, ill-focussed and unclean negatives, poor transparencies, ill-judged exposures, fog, and irrational development form some of the most prominent symptoms.

The patient who suffers mostly from this kind of complaint is he who has a small stock of negatives, but of great variety; from the hard chalky back-yard group to a *chef-d'œuvre* in the shape of the "Village Pump by Moonlight," awarded a second bronze at his Society's local exhibition of members' work only. *En passant*, I may remark that the fortunate owner of this remarkable negative will print the same in all the known and a few forgotten processes—carbon, silver, platinum, bromide, Solio, P.O.P., Artigue, Venus, and as many other styles, not forgetting ferro-prussiate, and often, let it be known, vastly to his own improvement.

Our beginner attempts too much, all his geese are swans, and worthy of reproduction and elaboration; but not even a trade enlarger is able to make negatives of uniform excellence from such a motley assortment; the quality will depend upon the skill of the operator and the technical standard of the original.

I find it hard to say which class of subject is the most difficult to enlarge—the portrait, pure landscape, seascape, or such combinations of these as interest individual workers. So much may be done with the soft, sharp, clean negative of good colour, by careful retouching and spot-

ting at various stages, by judicious exposure and development of transparency and negative. But I have no hesitation in saying that the easiest to enlarge, and the class which will most certainly hold its own in permanent interest, and meanwhile prove a source of pride and satisfaction, so invariably picturesque too if reasonable care be taken, is that which comes under the heading of pure architecture.

Erroneous ideas evidently prevail respecting carbon transparencies. These may look flat and poor, but the flatness is deceptive. The late Mr. John Harmer, than whom, I imagine, no one knew better how to make carbon transparencies for enlarging purposes, once made me a series of fully two hundred. As the negatives were not all of equal merit, some variation was to be expected in the positives, but they were all as nearly as possible structureless and beautifully clear. Mr. Harmer, by the way, used some of the finest *varnish* it has ever been my lot to meet with. I used the word *positives* just above. This is not quite the proper word, for a transparency for enlargement must not be looked upon in the light of a picture to be viewed; it is a means admirably designed to the end for which it was made, being rather soft (therefore with a tendency to flatness), and not so dense as would best suit a positive, say, for window decoration. I maintain that the *carbon* transparency is the ideal one for this work, and, although I never made them myself in the usual way of business, it is my rule to get the dry-plate transparency as nearly like its carbon brother as possible, and this can be done readily enough upon an ordinary Ilford plate by using a pyro-sulphite and ammonia developer. If a little under-developed, a brownish tint may be given by means of the mercury intensifier, and the resemblance completed by a coat either of plain enamel collodion, or a white, hard, not too thin varnish.

There is no advantage, except in relative cheapness, in the use of slow dry plates; quite the contrary. The idea that density is more easily obtained on slow plates is a popular one, based on the fact that it is less easy to over-expose to the same degree, as frequently happens when using very rapid plates. Of course, there are other considerations, but, as a rule, it may be said to be merely a matter of exposure. If you use slow plates for enlargements, it is easy enough to under-expose them, and you are inclined to wish you had sprung a shilling or two more for the "rapid," which would then have been "just the thing."

If the mere amateur will take the advice of an older hand, his work will consist mainly of architectural subjects, at any rate for some time to come, until he may consider himself proficient. Such subjects, fairly well done, and fully exposed, show least of all the signs of enlargement. In many cases it is hard to tell them from direct negatives. They are easily touched up and improved, by the judicious insertion of lights or strengthening of shadows, to a degree rarely achieved with landscapes, and only by means of a skilled hand in the case of portraits. The mere amateur of small means and modest outfit, possessed of interesting subjects of this sort, may quickly rival his wealthier and *dilettanti* brother, and will probably own a series of pictures which any one might feel proud of.

Let the subjects be of some interest, picturesquely disposed on the plate, sharp and well lighted, the negatives properly and cleanly developed; then, given reasonable care and skill, success is sure, not perhaps the ephemeral success of the exhibitions, but something much more permanent and satisfactory.

The possession of a room open to daylight, which can be set apart, at least on occasions, for photographic purposes, will smooth away many difficulties and lessen expenses, doing away with the necessity for special and, at the best, cumbersome apparatus. Such a room may be easily fitted, at an outlay of a few shillings, to produce the best work. If you have a room of this kind, never envy the man with the big enlarging camera, the best work is often done with the meanest contrivances.

My own room is, I think, fairly well arranged. In one corner is a dark closet, built near the window so as to utilise daylight as much as possible, neatly papered outside; against a wall leans a shutter, which can be quickly buttoned to the window frame; hinged to this shutter is the support for the camera, which carries at one end the transparency, and at the other the lens; a safe working light is provided by a large canary and ruby fabric covered window in the upper part of the shutter. The room is converted into a large dark room in less than one minute. There is no necessity to make these fittings unsightly and to keep the place like a joiner's shop, or as full of mess as a marine store dealer's. In preference to a hard-and-fast working bench, I use a couple of tables of similar size, which are placed end to end or side by side, as most convenient. A large folding screen completes the requisite furnishings, though, for my part, I could ill spare the *lathe*, which occupies another corner, or the armchair near the bookshelves; in other words, the work room may be comfortable and home like, and yet perfectly adapted for real good work.

Do not bother about "backing" plates. Use an easel and drawing board as a support for the plate, the board should be covered on one side with black velvet, which will answer as well as any ordinary backing. The operation of enlarging negatives is not one to be done in a hurry and all at once; rig up the apparatus first, with the object only of passing in review your negatives, experimenting with your lens, noting its covering capacity and the effect of larger or smaller diaphragms, marking the distances at which negative, objective, and screen are placed, studying the varying light and the best angle of reflector in order to get even illumination. Throw the enlarged images on to a sheet of white cardboard and carefully make selections. It will be a difficult thing to do, because most negatives show up best on the large scale, therefore the final selection must be more than ever judicious; speaking from the technical point, the negatives showing most contrast (I don't mean chalky negatives), those which give a bold, vigorous image, without big masses of *in*definite shadow in the foreground, will turn out the most satisfactory. When the apparatus is found to work smoothly, and everything seems clear and straightforward, it will be time to make the transparency, or more than one if desired, put this in the camera in place of the negative, and once more try for vigour, and detail, and contrast. Don't begin the actual enlargement until you are more than ready, that is to say, are prepared for all emergencies.

Any niggardliness in the matter of developing solutions is a fruitful source of failure. Pyro, and sulphite, and ammonia are cheap chemicals, and need not be stinted. One mixing will develop three or four plates. Half a pint of developer is not too much for an 18×16 plate.

Under-exposure is most fatal, and means, at the best, exaggerated coarseness. A mere suspicion of diffusion of focus may be permitted at times, but this must be carefully done. Thanks to celluloid films, not to mention the fact that negative glass seems much thinner than formerly, suitable clouds can be enlarged directly with the foreground; but, as a rule, I prefer to block out the whole of the sky of the latter, and print in a sky. I find this gives the cleanest results, and makes the amplifications less than ever noticeable.

Contact bromide prints will invariably give as good results as one need wish for, particularly if toned to a brown or sepia tint, but one would naturally transfer fine delicate detail to a fine smooth surface, so that Solio or P.O.P. would not be at all unsuitable on occasions.

J. P. Nott.

TRANSPARENCIES IN COLOURS.

[Translated for Anthony's Bulletin by H. Dietrich.]

All photochromes made on transparent films have only an inferior value for practical purposes, owing to the time necessary for their production; but, as lantern slides and transparencies, they deserve always a certain consideration, and they are of great value for the study of the three-colour printing process, being free from all the defects inherent to this process. The surprising beauty of these pictures has recently awakened general admiration, after the old process had been taken up again by Dr. Selle and executed with more modern appliances.

When transparent pictures are placed on top of each other, each will come to its full valuation, and, in this regard, the process will decidedly give a better guarantee for the correct reproduction of the original colours than the three-colour printing process. But the difficulties—which hinder also in this process the formation of a neutral grey—can only be judged upon if one tries to colour gelatine films with three pigments of equal distance in the colour scale, in such a way that, when laid on top of each other and viewed by transmitted light, they appear to be colourless. Only after prolonged experiments will a satisfactory result be attained. The smallest surplus of a colour will be distinctly shown, and the mixture obtained can, as a rule, be considered as grey if surrounded by lively colours. Similar difficulties are met with in the production of certain shades of brown. The general admiration bestowed on transparent three-colour pictures is less due to their correct resemblance to the original than to the pleasing effect of the magnificent pictures, which command so much admiration that one is satisfied to put up with the defects. In this respect we may allude to paintings on glass. In spite of incorrect colour production, hard outlines, and harmonious blending in the tones, a certain total effect cannot be denied, and we enjoy them to a perhaps higher degree than an oil painting which may be free from these defects. The perhaps missing grey and the incorrect browns are excused in the transparent pictures. The bright colours are a preventive of all criticism, while in the three-colour printing process just the reproduction of such tones deserves especial consideration, because they unite the colours to a homogeneous *ensemble*, and determine principally the character of the picture.

From this standpoint the value of the transparent pictures is to be judged; even if, regarding their faithfulness to the original, they would be satisfactory to only very moderate requirements, their colour magnificence secures for them always general approval.

In the production of such pictures the first point is the selection of a suitable carrier for the three-coloured part pictures. Thin isinglass sheets are very good for this purpose, but they can be had only in small sizes of a satisfactory purity, and they are also pretty high in price. Celluloid is a very good material, but, unfortunately, it stretches too much under the influence of moisture, and will never return to the exact original size after drying. The pictures are made upon these sheets with light-sensitive bichromated gelatine, and are then coloured with solutions of tar-colour matters. The application of coloured pigment papers cannot lead to a satisfactory result, as all the substances used for colouration, such as carmine, Paris blue, &c., do not meet the theoretical requirements, and tar-colour matters, soluble in water, are, to

arge extent, extracted from the gelatine during development of the cture. Most of these colour matters make the gelatine insoluble, and, r this reason, are not applicable. The subsequent colouring of the ctures offers the advantage, that their colour intensities can be toned wn until, when placed one on another and looked at in their transrency, they will give the desired appearance.

The negatives may be printed upon chromated gelatine paper, and en developed in the same way as pigment prints, and transferred upon lluloid or isinglass; or the latter may be coated with gelatine, nsitised in the bichromate bath, printed after drying from the versed side, and developed in warm water. To be able to control the veloping process, on the one hand, and also to avoid the formation of o high a relief, gelatine films, which contain an addition of bromide of lver, are used. A bromide of silver emulsion, made in the usual way, used. In the preparation of the same, eight to ten parts nitrate of lver are applied to each thirty parts gelatine; after solidifying, it is ashed in cold water, and is used for the production of the pigment aper to coat the films. The bromide of silver, not playing here the art of a light-sensitive substance, but solely that of a pigment, the eparation of the emulsion, as well as the coating of the paper, can be one in broad daylight.

The celluloid films intended for the picture are soaked in cold water, nd their edges fastened to glass plates with strips of paper. After rying they will lie completely flat, and, to prevent the paper strips from osening in the subsequent treatment, these are coated with wax. Upon ne film so prepared the bromide of silver picture is then transferred.

If the three films are treated in a uniform way, the pigment paper ntended for printing is cut from the sheet in equal direction, and, if all ircumstances affecting a stretching of the picture in the transfer are nsidered, three pictures of equal dimensions will, as a rule, be obtained. ut the success of the process is, in this regard, always questionable, nd, with regard to an exact fitting of the part pictures, the printing pon bromide of silver-isinglass films is to be preferred under any cirumstances.

The bromide of silver pictures must be of a thoroughly uniform haracter, and, to enable a control in this regard during the operation of olouring, it is advisable, when the photographic original is taken, to lace alongside of the same a scale formed of neutral grey papers of ifferent brightness. This grey scale has to show the same appearance n the three negatives and the three prints.

The bromide of silver and the reduced silver which may be there is emoved from the pictures with a solution of hyposulphite of soda and ed prussiate of potassium, after which they are washed and coloured. 'or the colouring of the pictures three pigments of equal distance from ach other in the colour scale are to be selected; and, as yellow cannot e a mixed colour, the colour system yellow, blue-green and purple is to e used. Corresponding with these colours, the negatives are to be roduced. They must be very delicate, and should have been sufficiently xposed, with good and strong details in the shadows. If the negatives re too strong or hard, they are useless for the process, causing spotty hadows without detail and wrong in colour.

The colour process does not consist in a mechanical absorbing of the olour-matter solution, but there is a kind of chemical combination of he gelatine with the colour matters. This combination is, of course, a ery loose one, longer washing decolourising the gelatine again. The ollowing appearances seem to prove a chemical combination:—

1. Even very diluted colour-matter solutions will produce a very ntense colouration of the gelatine if subjected to prolonged action.

2. The tar-colour matters, by reason of their chemical character, have very diversified behaviour towards gelatine. Many of them will give o colouration at all in diluted solution; others will colour in presence f an acid; and others, again, only when their solution has an alkaline eaction. The gelatine plays, therefore, here the part of an acid, and here the part of a base.

In general, the colouring with an acid colour matter is more successul than with a basic one; therefore, the employment of the former is to e preferred.

Eosine and rhodamine are also applicable in neutral solution.

From a great number of colour matters the following were selected as uitable in tone, and for the colouration of gelatine pictures:—

For the red picture, erythrosine in neutral solution.
For the yellow picture, naphthol yellow—*S* in acid solution.
For the blue picture, genuine green bluish* in acid solution.

Regarding the last-named colour matter, it should be remembered hat under this name different green-tar-colour matters are on the narket, which have either no colouring effect whatever, or give a ifferent tone, and only the preparation made by F. Bayer & Company, f Elberfeld, is satisfactory, so far as I know.

One gramme of these colour matters is dissolved in 200 cubic centiietres, and is kept in stock as concentrated solution. For use, this is iluted with ten to twenty times its volume of water, and, to the yellow nd blue liquid, from five to ten drops of glacial acetic acid are added to ach 100 cubic centimetres; to the yellow liquid also a few cubic centiietres of saturated chrome-alum solution may be added. The more concentrated the colour-matter solution is, the quicker it will act, but the picture will also become so much flatter. A very diluted solution should be left to act for several hours, but it will furnish then very brilliant pictures with rich details. If the coloured picture is treated with water, or, better, with a very diluted borax solution, the colour matter will again be removed from the gelatine and the least coloured parts will bleach first. Supported by these facts, it is therefore in the operator's power to impart any character to the pictures, and to change them until they show the desired effect when laid on each other.

* Echt blau-grün.

The gelatine picture to be coloured is laid upon a horizontal glass plate after drying, and flowed with the colour-matter solution in such a way that this covers the whole picture. Small pictures are put into a dish filled with the solution. If, after a few minutes, the whole design appears pretty strongly and almost evenly coloured, the solution is diluted with two to three times the volume of water, and then it is left to renewed action. If the colouration was already very intense, the picture is washed for a short time, and then the colouration is continued with a diluted solution. In this way the operation is continued until the picture possesses the desired character, when it is rinsed in water, to which are added a few drops of acetic acid. The remaining liquid is removed with blotting-paper, and it is then left to dry.

With a correct condition of the negative and suitable printing time, the colouration will mostly be completed in one bath without the necessity of any extra manipulations. After about an hour the picture will have the desired appearance.

When the pictures are put together by way of trial, this should be done carefully, of course, being governed principally by the appearance of the grey scale, but it must be remembered that the colouration of the gelatine changes considerably during drying. The blue picture assumes a more greenish tint, and the red picture will have a more bluish tone. Only the yellow picture remains almost unchanged. It is therefore advisable to proceed in the following way:—

First the blue and red pictures are coloured in such a way that, after drying, the grey scale will show in all grades a uniform blue colour, which is complementary to that of the selected yellow. This is the colour of an alcohol cyanine solution moderately diluted. The third picture is then coloured yellow, in such a way that it will be supplementary to the blue scale in grey.

After drying, the films are cut from the glass plate, and mounted one on top of the other in a suitable way upon a new plate.

This process, as described, differs essentially from that worked by Dr. Selle, but the results of both methods with regard to the reproduction of the colours may be considered to be the same.

Finally, I might remark that all the colours in these pictures will change in a different illumination. A picture toned by daylight will, with yellow illumination, show essentially different tones. This appearance is particularly observable with the grey, which, in lamp light, has a yellow-brown appearance.

A. Freiherr von Hübl.

MY METHODS OF MAKING LANTERN SLIDES.

[Read before the Manchester Amateur Photographic Society.]

A month ago I was requested to demonstrate before you my method of producing lantern slides; so, when I got home, I got out my note book and fountain pen, thinking that I could make a really good paper out of the subject; but, whilst I was wondering where to begin, I remembered that there were three others to follow me, and far better slide-makers than I could pretend to be; and then again I bethought me that possibly they might come before me; and so all the wind would be taken out of my sails and my grand paper might sound like an old, old story. And, again, as most successful slide-makers work on much the same lines, it would perhaps be better not to write anything very elaborate, so I just jotted down a few stray thoughts, and will leave the demonstration to speak for itself.

The first thought that came was a remark I once heard or read that "in the making and exhibition of lantern slides is more promise of practical use and pleasure to the greatest number than in any other photographic process whatever," a remark with which I entirely agree, for an ordinary print or transparency may give pleasure to a select few, but a good lantern slide may give pleasure to hundreds or even thousands at one and the same time.

I have heard it said that there are *no* pictorial possibilities in lantern slides—that when projecting on the screen they are altogether too ephemeral to be classed with prints on paper. Of course, they cannot, that I acknowledge, but they form a class of their own, and I confess that many slides that I have seen live in my memory, and always will live, and are a constant source of pleasure to me, such as no print I have ever seen is.

The quality of the slide depends in a very great measure on the excellence or otherwise of the negative, both technically and artistically, from which it is made. It is difficult, if not impossible, to make a good slide from a poor negative. What is the best kind of negative for this purpose?

I should say, from my own experience, one that will give a good print in cold-bath platinotype will give equally good lantern slides—that is to

say, one that is correctly exposed and developed so as not to give excess of density in any one spot, and is at the same time fairly sharp and full of half-tones and detail.

At the present time, owing, no doubt, to the extensive use of gelatino-chloride papers, there is a tendency to produce rather thin, weak negatives; though that kind of negative is not the best for lantern-slide work, a great deal may be done by altering the exposure and developer. For this, fully exposed negatives, cutting down the exposure somewhat and using a strongish developer, will help to produce a crisp result; or from a somewhat hard negative a better result will be obtained if a full exposure nearer to the light is given to the plate and a little weaker developer is used.

I cannot tell you of anything new in slide-making; in fact, I don't think there is anything new to be told. My method is, I believe, almost identical with that of many of our friends; but, as I have never had the pleasure of seeing any one else make a lantern slide, perhaps my method may be different in some minor points.

I may say that, although I have been fairly successful, I am not a very prolific producer of lantern slides, for the reason that almost all my slides are produced by reduction in the camera by daylight and I have very little spare time whilst that light is available; but I can say that I firmly believe that by reduction we get better results than by contact printing, for this reason, in all negatives there is always a certain amount of granularity, more especially in negatives produced on very rapid plates; so, of course, this granularity must of necessity be transferred to the lantern plate when printed by contact, whereas, by reducing the size of the picture, you also reduce the size of the grain in the negative.

I have brought my very primitive home-made apparatus with me to show you that you need not spend much money in that direction. It consists, as you see, of a wooden box, with the ends taken out, fixed on one end of a board, and at the other end is an old quarter-plate camera. It is attached to the board by an ordinary mill-headed screw, which moves backwards or forwards in a slit cut for the purpose in the board; so you see that, if you have time while there is daylight to make your slides, the expense need not be great—lantern plates are cheap, the apparatus is cheap, and the chemicals amount to a mere trifle.

I occasionally work slides by contact, as it sometimes happens that a small portion of a negative is better than the whole, and for this process I find a special printing frame is advisable. The one I use is made by Middlemiss, and cost three shillings. It is well worth the money, as by its use I can most accurately render the part I wish to reproduce and have no fear of the light creeping in round the edges of the plate and so causing fog, as it will do when an ordinary printing frame is used; and another advantage I find is that there is no danger of scratching, and so utterly ruining, what may be a very valuable negative.

Having selected the negative I wish to print from, I next consider whether the slide is to be made by contact or reduction. If I wish to include all that is on the negative, there is no alternative, it must be made by reduction, whether the negative be a quarter-plate or a 12×10 one; but, if only a small portion of the subject is wanted, then I may decide on making it by contact. Supposing that I decide on the latter, I carefully spot out any pinholes there may be with Indian ink, and, when that is dry, as carefully dust with a flat camel's-hair brush and then adjust it in the frame, and, after dusting the lantern plate also, just drop it in position, turn up the gas, and expose at a distance of twelve inches from the light, for from thirty seconds to three or four minutes, according to the density or colour of the negative. I then proceed to develop, having previously made up the following solutions:—

1.	Hydroquinone	160 grains.
	Sulphite soda	4 ounces.
	Citric acid	80 grains.
	Bromide potash	40 ,,
	Water	20 ounces.
2.	Hydrate soda	160 grains.
	Water	20 ounces.
3.	Ammonium carbonate	1 ounce.
	Water	10 ounces.
4.	Potassium bromide	1 ounce.
	Water	10 ounces.

If I wish the slide to be brown, I now take

No. 1	½ ounce.
No. 2	½ ,,
No. 3	30 minims.
No. 4	30 ,,
Water	2 ounces.

But, to produce black tones, I only take

No. 1	½ ounce.
No. 2	½ ,,
Water	2 ounces.

I now see that my dishes, &c., are properly clean, and then take out the lantern plate and again carefully dust it, place it in the developing dish, and pour over it the solution, seeing that every portion of the plate is covered by it as quickly as possible, and rock the dish gently.

And now that most difficult problem faces me, when to stop development; and I am sorry to say that all I know about that is that I stop when I *think* the density is about right. No infallible rule can be laid down. But I would advise all who are without experience to beg, borrow, buy, or st—— them! At least, by some means, get a really good technical slide and keep it for comparison. I generally develop until it appears to be a trifle more dense by transmitted light than the finished slide ought to be; in fact, I develop until the high lights just begin to show signs of veiling over, as it loses somewhat in the fixing bath. If the high lights veil over before density be obtained, it is a sure sign of over-exposure. When the critical time has arrived, I give it a good rinse in water before placing in the usual hypo bath, as, if this be not done, stains are very liable to result. The slides remain in the fixing bath (4 or 5 ounces hypo to 20 ounces water) for at least ten to fifteen minutes, and then wash in a siphon tank in constantly running water for about an hour, and finish off with a good swill under the tap. At the risk of appearing wearisome, I would emphatically repeat, that to be sure of getting permanent results the fixing and washing must be thorough and well done.

T. Morley Brook.

BINOCULAR VISION.

[Photographic Times.]

Probably the most perfect example of the photographer's art is the stereoscopic picture when the subject is well chosen. Prints made in the forms of transparencies, on glass, and viewed in a proper instrument, the resulting impression on the mind comes nearer to that of the actual scene than any other process yet discovered, and it is a source of congratulation that interest in this method of picture-making seems to be awakened.

I have mentioned a stereoscope as one of the apparently essential elements in the combination above which goes to make up the successful result upon the mind of the observer, and gives to the flat pictures the relief and perspective of nature. Such, however, is not the case. Stereo pictures may be viewed by the unaided eyes quite as successfully as with the aid of the stereoscope, and the power of controlling the necessary muscles of the eyes to accomplish this result is easily acquired by any one who will take the trouble to read this article.

The principal function of the lenticular stereoscope is to enable the right eye to see the right-hand picture, and the left eye to see the left picture. Incidentally the lenses may magnify a little, but that is not essential. This being the case, we may discard the instrument, and all we need to do is to look directly at the right picture with the right eye and the left picture with the left eye, and we have exactly the same relief and perspective that we get when using the stereoscope.

The ability to do this involves the power to control, by direct action of the will, muscles which we ordinarily use automatically, and therefore unconsciously.

When we fix our eyes on a single letter of this printed page, held at the ordinary distance for reading, lines passing through the axis of each two eyes converge and meet at a point, say, twelve inches distant. When we raise our eyes to the sky, the lines passing through the axis meet at infinity, and the rays are practically parallel; we have simply rotated the axes outwardly. Now, this is exactly what we want to do to see a stereo picture in relief; we must hold it at a convenient distance from our eyes and look at it as if it were at an infinite distance.

Many persons will find that they can do this at will; others will require a little practice. Stand in front of a window, moisten a bit of paper a quarter of an inch in diameter, and stick on the glass opposite the eyes. Looking past the paper at the scene outside, one becomes conscious that there are two bits of paper; that is, the parallel rays from each eye take cognisance of the spot. Place a second bit on the glass at a horizontal distance equal to the interval between the eyes, say 2½ inches; then, looking at the distant scene, the eyes take cogisance of four spots. By-and-by the two middle ones coalesce and seem to melt into each other, and this is the image which, when pictures are substituted for the bits of paper, forms the relief, or image in perspective.

Substituting for the bits of paper a stereo picture, and using the eyes as we did before the glass, we get as the result a picture exactly similar to that produced by the stereoscope.

Most stereo pictures are wider between centres than the normal distance between the human eyes, and to see them successfully necessitates the eyes being rotated outwardly, so that the rays are not parallel, but diverge. This requires practice, but, when the control is once acquired, it is very pleasant to look over a collection of stereo pictures without the necessary dependence upon the stereoscope.

All this is old and elemental, and I have restated it in order to call attention to the fact that two prints from the same negative, viewed in this way, present a relief and perspective, it seems to me, quite as marked as if produced by two lenses.* Take duplicate cabinet heads and look at them as suggested, and you will be surprised to find that the image detaches itself from the paper, steps out to the front and assumes a plastic form which carries a charm no flat picture is ever capable of, and one is conscious of new and undiscovered beauties in the work, and, alas! defects also.

A. Sawyer, U.S.N.

[* Not so.—Eds. B. J. P.]

ACTION OF LIGHT ON PLANTS.

[Scientific American.]

It is well known that most animal organisms need the direct influence of sunlight for their proper development, and in the same way plants, and, in fact, all life on earth, depend on the action of this wonderful agent. The beautiful structure of plant cells, the study of which constitutes the most interesting part of plant biology, has never been properly understood until now: but men like Liebig and others have determined the peculiar use of the cells in the life of plants, and have also included in their investigations, as of equal importance, the processes of nutrition. Present knowledge shows that plants take from the atmosphere what is needed for the formation of the cells, and also throw off useless material through the leaves. Thus carbon is taken up by the leaves, which transform, under the influence of sunlight, the carbonic acid taken from the air and through the roots into carbon and oxygen. Water and salts are also taken up by the roots of the plants.

The various ways in which the sunlight affects the leaves and blossoms, and consequently the whole development of a plant, must be considered in the study of plant physiology.

It is well known that sunlight has a decided influence on the colouring of the leaves, which look sickly and pale when the plant has only a little sunlight, whereas strong sunlight increases the amount of chlorophyl, thereby giving the leaves a richer colour. Referring to the influence of sunlight, we may with propriety speak of the rays that work chemically, others which act simply as dispensers of heat, while still others are simply light rays, even though there is not actually such a division in nature. The chemical action of the sun's rays can be best understood by the wonders of photography, and we certainly cannot go astray in assuming that certain rays of the sun's spectrum also have a special influence on the plant cells, which will, doubtless, affect the plants of the different species differently, for the conditions of light and heat impress themselves clearly on the character of the plants.

Former observations have already proved that certain rays of the sun's spectrum have a harmful effect on plant organisms, while, on the other hand, others accelerate the circulation of the sap and the assimilation of nourishment, thus promoting the growth of the plant. A recent experiment made by the well-known French physicist, Camille Flammarion, at the Agricultural and Climatological Experiment Station, at Juvisy, indicates plainly the effect of different-coloured light upon plants, and the result is of special value, practically and theoretically, to plant physiologists and climatologists. It has been clearly shown by the various experiments that ordinary "colourless" light is represented by natural sunlight, because, when exposed only to it, health and natural growth reign. Coloured light, according to the particular colour used, causes either one-sided acceleration or retardation of the development of the plant. In his most interesting experiment, Flammarion adopted the plan of exposing sensitive plants (Mimosa sensitiva), which he raised from seed, to different coloured light. These plants are specially sensitive to the effect of light and to touch, and were therefore well adapted for Flammarion's experiment.

He planted a number of seeds, and the seedlings, after they reached a height of about one inch, were planted in pots, in pairs, and placed in a hot-house, where each pot received the same quantity of light, and an even temperature prevailed, so that the plants were subjected to the same conditions. But the experimenter placed over some of the plants bells of green, red, or blue glass, while others received the sunlight through the plain glass of the hot-house window. The effect of the coloured light was soon perceptible in the development of the plants, and the more they developed the plainer this difference became, until, at the end of two months, the plants under the red glass were sixteen inches high, those under the green glass measured only five inches, and those under the blue glass were only one inch high, while the plants that had been left in the "colourless" light were four inches high.

The red light forced the plants most, for those subjected to it blossomed five weeks after the seeds were planted, and the stems were much longer than the stems of the other plants. The difference between them and those exposed to the blue light was most marked. The leaves of the latter were, indeed, dark green, while the leaves of those subjected to the red light were pale, poor in chlorophyl, but the plants themselves seemed unhealthy and stunted; they had gained nothing in height since they were placed under the blue glass. Therefore it was proved that the blue light was not only an impediment, but an actual injury to vegetation. The effect of the red light was noticeable, not only in the growth of the plants, but also in their sensitiveness, for even the slightest touch, a breath, was sufficient to cause the leaves to close and the little stems to droop. The plants exposed only to white light were not so easily affected, and those raised under blue glass were not at all sensitive. Those raised under white light must be considered normal. They were more stocky, and showed a greater tendency to bud, but the buds did not open.

Flammarion extended his experiments to other kinds of plants, such as geraniums, strawberries, &c., but in all cases blue light proved injurious to vegetation, and plants that were exposed to its influence for months showed no development. All the functions of the plant organism seemed to be suspended. The fruit of strawberry plants developed under bells of different colours, but varied considerably in size and quality, as in some cases the leaves were developed at the expense of the fruit, and in other cases, as when the plants were exposed to blue light, growth was impeded in every way.

By making these investigations Flammarion has given an impulse to the study of the subject, and new results will be obtained which will be of practical use in gardening and the propagation of plants.

LANTERNS IN CHURCH.

In a recent number of the *Guardian*, the Rev. J. Howard Swinstead, of Church House, Salisbury gives his experience of lantern services:—

"My services conducted with the lantern have been four in ancient churches, seventeen in mission rooms, and 102 in schoolrooms, *in the open air*, or in a consecrated mission tent. The subjects were always sacred.

"On no occasion has any building been injured by such use; because a Norman arch is covered temporarily, it need not be disfigured, any more than by hiding your face you deface it. Once a drunken man was, foolishly, admitted, but his ejection was rapid and effective as soon as he opened his babbling lips.

"Once again I was warned that irreverence was likely from young dissenters in their teens and corduroys, and I prefaced the service by saying:—

"'It is usual for magic-lanterns to provide amusement; this is not the case now. Those who have come to be entertained or amused will do well to quit the building, for, if they stay, they will be disappointed.'

"No one left, and no one interrupted.

"These happy consequences are not at all due to slackness of discipline. Not even my worst enemies could accuse me of that. Indeed, the attentiveness at a lantern service (so long as it is kept going with a swing, and is not muddled) is far more silent, and the silence far more reverent, than in the sombre formality of some ecclesiastical trillings.

"Of the legality of lanterns in churches I know little, but presume that one artificial light is as lawful as another, whether standing on a pedestal, supported by a bracket, or suspended from a chain.

"If it is not illegal to light up a church and see a picture in stained glass from the outside, why should the same, or a better, picture be illegal on a screen? To the screen stretched across an arch we may find a parallel in any other curtain suspended similarly; and the slides, coloured or otherwise, are no whit different from coloured windows, but immensely superior in many cases, both in design and execution, and by their possibility of rapid removal when they displease or teach amiss.

"The system of teaching by pictures has always had the approval of the Church from the first days of the institution of types, through all parabolic teaching, and by means of miracle plays and *tableaux*, in spite of Mr. Browne's assertion about forefathers not utilising such methods.

"If we are now told that, because people *can* read sacred books, they do so, or that, because we preach sermons, all our congregations listen, we boldly reply that we are incredulous of these astounding statements.

"When to the eye as well as the ear appeal is made, two channels to the mind are opened. Opponents do not commend their own sincerity when they speak of 'expedients to amuse people' in church, for no one believes a lantern would be brought into church for amusement's sake. But it is a plain fact that the lantern does attract a certain class of people, whom conventional services do not."

THE MERIDIANAL PRISMATIC GLOBE.

Numerous contrivances have been devised from time to time for increasing the illuminating capacity of the various means of artificial light. Some of these devices are on the market, and consist of reflectors and variously shaped or curiously cut globes. The latest of these contrivances to make its appearance in our midst, says *Invention*, is unquestionably the best by a long way. This is the meridianal prismatic glass globe, which we have just had the opportunity of inspecting in use, as applied both to incandescent gas mantles and electric glow lamps. Nothing could be more simple than this globe, and nothing more ingenious, and at the same time more original. The globe is made with a series of prisms, which form vertical angular ribs on its interior surface, the exterior of the globe being perfectly smooth. The prisms are so arranged that each bears throughout its entire length the same relation to the enclosed light that all the others bear. These prisms are relatively arranged like the meridian lines on a terrestrial globe, the width of each prism being greater at the middle of its length than at its ends. As the prisms bear a uniform relation to the enclosed light, the rays are diffused and reflected uniformly throughout the surrounding space into which they are projected. Placed over a gas jet, an incandescent gas mantle, an electric glow lamp, or any other lamp burner, the effect is most remarkable. The flame is softened and its volume enormously magnified,

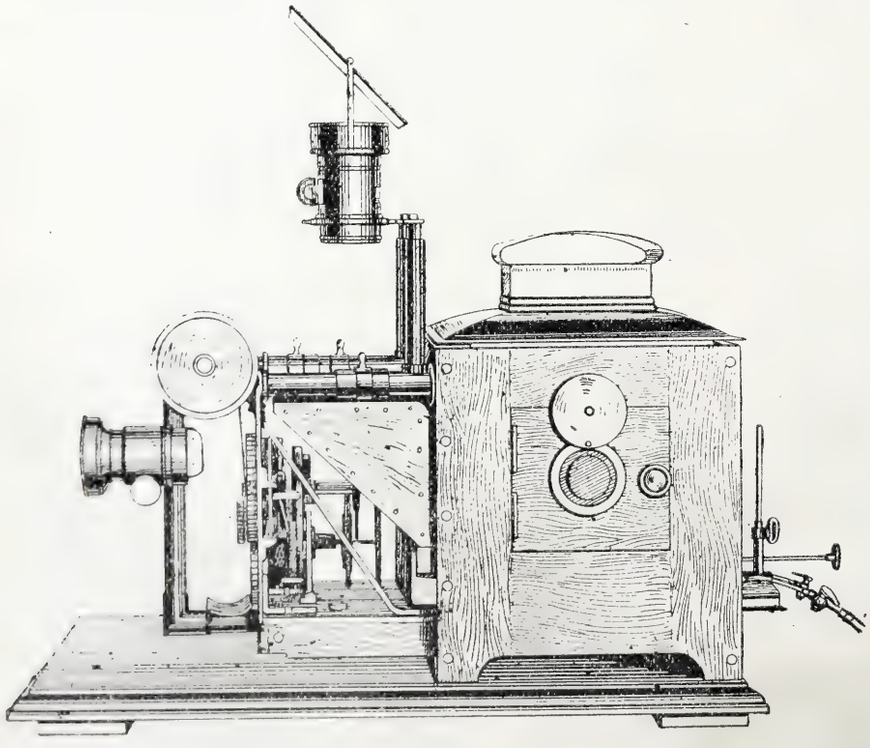
the flame apparently nearly filling the globe, whilst its wide diffusion and the increase in its illuminating power are very remarkable. The distribution of the rays takes place, not merely upwards and in the plane of their source, but downwards, where light is as a rule chiefly required. We are informed that these globes, which are made by special appliances, can be produced at a cost which will allow of their being sold at a price which will bring them within the reach of every one, and yet leave a good profit to the manufacturers.

Although the meridianal globe is not yet on the market in this country, it has been in satisfactory use in the United States, which is the land of its birth, for some time past. It has there been tested photometrically by Mr. J. W. Cowles, the electrician of the Boston Electric Light Company, and whose name is well known over here. That gentleman pitted it against globes of other kinds, placed over electric glow lamps, with remarkably satisfactory results. With an ordinary globe a 16 candle-power lamp was reduced to 10·2 candle power, showing a loss of 36 per cent. With the meridianal prismatic globe there was a gain in photometric power of no less than 41·6 per cent., and with other kinds of globes the gain was in proportion. Photometric tests of gas-burners with the prismatic globes, against the same burners with ordinary globes, show a similar relative gain. Another well-known American expert, Professor E. E. Cary, of the School of Technology, Boston, U.S.A., has also carried out an elaborate series of comparative tests with prismatic globes with similarly satisfactory results, which point to the economy resulting from their use. Far more valuable from a practical point of view perhaps is the testimony of Colonel W. E. Barrows, President of the Welsbach Light Company of the United States. He certifies that they have been buying prismatic globes in large quantities, and he commends them very highly for their excellent diffusion of the light. For our own part, we are greatly taken with the invention, which we consider to be the most strident advance yet made in the direction of substantially improving the illuminating power of a given source of light. We were highly pleased with this globe, both as regards its use over a Welsbach mantle and over an electric glow lamp, the light being well diffused, as well as restful and agreeable to the eyes. We saw it tried with the electric glow light at the show rooms of New and Mayse, Limited, Bridge-street, Westminster, and the contrast between its light and that of an adjoining lamp—both of 16 candle power—enclosed in an ordinary cut glass globe was very great.

NAISH'S CINEMATOGRAPH.

[J. W. L. Naish & Co., 12, Carnegie-street, Edinburgh.]

The makers claim that this cinematograph is different in construction to all others. There are no rollers, no drums, no sprocket wheels, no springs. The pictures are steady from start to finish, the flicker is scarcely seen and it is impossible to tear the film. Whilst a new film is being put in,



other pictures can be shown on the screen. Titles or descriptions of the next films can also be shown. The mechanism is very simple, and not liable to get out of order. It is driven by a small handle, but a motor can be used if preferred.

ASHTON-UNDER-LYNE PHOTOGRAPHIC SOCIETY.

January 26.—Mr. Charles Lord lectured on the Dolomites. He said some people had a very hazy notion about them. They associated the Dolomites with the Amorites, and Hittites, and Jebusites, but they were wide of the mark. We confess the word looks something like the name of a new religious sect, or a fresh division in the Irish party. But these suppositions, too, are futile guesses. The Dolomites are certain groups of mountains in the Austrian Tyrol. They are the most remarkable among the Alps for the singular beauty snd fascination of their colours, particularly when seen in bright sunlight. It recalls to the mind that entrancing picture of the New Jerusalem, whose walls are "garnished with all manner of precious stones." They give an opportunity for photographing in the natural colours. Here is what we find in a brief description of these mountains: They are formed of magnesium limestone, a rock named after the geologist Dolomieu. They attract many tourists on account of their grand fantastic outlines, and the weird splendour with which they are lit up at sunset, when their crests take the semblance of transparency. Mr. Lord's views were exceedingly good, and the large audience were much indebted to him for the great treat he afforded them. Practically, they enjoyed much of the pleasure of foreign travel without any of its discomforts. In a little more than an hour they reaped no small share of the results attending many days of toilsome trudging and laborious climbing.

Keeping Limes.—"Here is something that may help some lantern operator. We all know," says Mr. Charles A. Black, "how treacherous limes are, and I have found many who believe their slacking without notice is a necessary evil, but I do not agree with that opinion. I forget where I learned the trick, but for years I have saved money, patience, and limes by rubbing a little tallow on the threads of the lime canisters, and screwing the cap down tight on a soft rubber ring, such as is used on fruit jars. I have just used some that I bought over a dozen years ago, and kept in this way, the box being opened as occasion demanded, and I find them as good as when first bought, so I have had every chance to see how the plan works. When I have been using the limes in a damp atmosphere, I generally empty the whole boxful on a newspaper, and place them in an oven until they are thoroughly hot and dry, then pack them away as described. On election night I noticed that the ends of the limes in the holders had slacked and swelled a little, due to the very moist atmosphere, something I never noticed before. But it must be remembered that they were eight hours in use. While speaking of tallow, I may say that a piece of raw tallow is one of my lantern accessories, as I have not yet found anything to equal it for lubricating taps, &c., although I have tried several other substances."

Technical Education Wanted.—Professor: "What are elementary physics?" Overdosed Student: "Brimstone and treacle, and salts and senna."

We cull the following interesting correspondence from the *Indian Photographic Society's Journal*: "Acetylene Gas Generators in India. To the Editor.—Dear Sir,—For the information of the readers of your *Journal* you may like to warn them against ordering acetylene gas generators from England, lest, like myself, they should be supplied with the generator but no calcium carbide, which, I fancy, is *not* procurable in India. (*N.B.*—Bathgate & Co. cannot supply it.) The enclosed post-card will explain the difficulty in shipping carbide. Can you advise me how to obtain the much-needed carbide, without which the generator is useless?—H. E. Goodwyn. Dear Sir,—You will, no doubt, be wondering why the generator, &c., has not yet arrived. We will explain. It was sent by Pickford to your agents, as you wished, September 24. About ten days afterwards, Messrs. Woolley sent for it. Messrs. Pickford tried to ship it, but it was refused as containing explosives, and returned to us with a charge of 4*s.* 7*d.* on, which we had to pay. Messrs. Woolley refused it, and now we have had to take out the calcium carbide, and Messrs. Woolley took it away yesterday. We do not refund money for calcium carbide, as we have had to pay the 4*s.* 7*d.* You will, however, be able to get that in India at wholesale druggists'. Trusting you will receive goods quickly and safe, We beg to remain, yours faithfully, Thorn & Hoddle. [All new chemicals are looked upon by shippers with much suspicion, but this will pass away. There should be no difficulty in getting calcium carbide in India, seeing that it is made largely in America and shipped to England. Messrs. Thorn & Hoddle, who supply the generator, will doubtless find out a way for you. If calcium carbide is obtainable in India, perhaps some reader may be able to help Captain Goodwyn.—Ed.]"

MONTHLY SUPPLEMENT

) THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*March* 5, 1897.

THE LANTERN RECORD.

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CARBIDE OF CALCIUM: ORDER IN COUNCIL.

consequence of the growing importance of carbide of calcium, the fact that the contact of moisture with this material causes evolution of acetylene, the Home Secretary has caused inquiries e made into the subject, with the result that an Order in Council made on February 26, under the fourteenth section of the Petron Act, 1871, bringing carbide of calcium within the operation of that . Accordingly, from the date on which such Order comes into e, viz., April 1, 1897, it will be unlawful to keep carbide of ium except in virtue of a licence to be obtained from the local hority under the Petroleum Act. Any local authority to whom lications may be made for a licence to keep carbide of calcium , if it so desires, obtain, on application to the Home Office, a norandum showing the character of the risks to be guarded inst, and containing suggestions as to the nature of the pretions likely to be most effectual for securing safety.

LANTERN NOTES AND NEWS.

art department, with a number of skilled assistants under the erintendence of an honorary worker of great experience, is v in full working order at the headquarters of the Church Army Edgware-road. This new departure has been rendered necessary ough the extraordinary hold taken by the magic lantern in church mission services throughout the country. Every week several usands of slides are sent out on loan by the lantern department, although this department has been repeatedly enlarged, it is only h great difficulty that the applications from clergy and mission kers for lanterns and slides can be met. The new art department lertakes the painting of lantern slides, the designing and execution lluminated texts and banners, and other similar work.

* * * * *

DR. K. BIERBACH, of Berlin, has made a material modification of ordinary Bunsen burner, says the *Progressive Age*. The Bunsen ners now in use suffer from too great rigidity of form, which kes it impossible to use the burner for certain purposes. A lateral ting of apparatus can be accomplished by the ordinary Bunsen ner with difficulty only, while in some cases it is entirely out of question. Yet it is frequently a necessity, for instance in the tilling of liquids possessing a very high bursting point, or of those ich are violently agitated by boiling; or it is desirable for other sons to place the burner not under but beside the apparatus.

The improved burner is so constructed that its flame can be moved in every direction like the stream of a fire engine. The burner consists of a mixing tube for gas and air bent in a right angle so as to form a long shank and a shorter one. The long shank is so arranged in a ring provided with a screw that it can be turned and moved in the ring. The ring can be turned around the axle of a vertical joint which rests upon a flat, plate-shaped foot. By this triple action the knee tube can be put into any position desired, and the mixture of gas and air can be conducted through it in both directions by means of an adjustable rubber tube. When the gas is conducted through the lower shank, the burner can be placed under the lowest apparatus; when it flows into the shorter shank, the position of an ordinary Bunsen burner is obtained; by inclining it, lateral heating can be accomplished.

* * * * *

I READ somewhere, a few years since, says the editor of the *Photo-American*, a good plan of keeping lantern slides in their indexed order in a box. It is so simple and has proved so satisfactory to me, that I give it here. Arrange the slides in the exact order required, quite filling the box with them, and then, with a straight edge and a brushful of colour, paint a line diagonally across the tops from end to end. As the line will be broken if one is replaced wrongly, it will be seen that this point is of the greatest assistance in keeping lecture slides in correct position.

* * * * *

WRITING of the amount of powder used in flashlight work Mr. Dundas Todd, in the *Photo Beacon*, says: Nearly all my exposures are made at a distance of about six feet from the sitter, and by actual weighing I find that, when using a fast plate, the lens working at *f*-8, there must be used from 10 to 12 grains of powder (Smith's Condensed Light is the brand I have been using). In actual practice I do not weigh, but measure out with a metal mustard spoon which holds about that quantity. When the light is at a different distance, I calculate the quantity necessary by the law of inverse squares, for, as every photographer knows, the intensity of light varies with the square of the distance from the source. For instance, suppose the lamp to be nine feet away, then I square both 6 and 9, which gives 36 and 81, or a ratio of 1 to $2\frac{1}{4}$, so that, if no other condition is required to be considered at nine feet with stop *f*-8, one must use $2\frac{1}{4}$ times 12 grains. But, so far as the lens is concerned, the source of light is the sitter, and the same law applies here, so that these figures must be doubled, consequently our 12 grains at six feet must be multiplied by twice $2\frac{1}{4}$, giving 54 grains of powder at nine feet as compared with 12 grains at six.

* * * * *

Mr. TODD continues: This result is apt at first to be rather startling, and it was so to myself. At the very outset I allowed for the distance from lamp to sitter, but was at a loss to account for under-exposure until I remembered the other factor, since when I have had no trouble. The following table shows the amount of powder necessary at different distances, the lens supposed to be working at

f-8. With *f*-11 one must, of course, double the quantity, and with *f*-16 it must be quadrupled. Smaller stops than *f*-16 are practically inadmissible in flashlight work.

6 feet	12	grains.
8 „	42	„
10 „	66	„
12 „	96	„
15 „	⅓	ounce.
20 „	½	„
25 „	1	„
30 „	1½	„

In my own experiments the farthest away from the subject that I have yet been was thirty feet, and on that occasion I used one ounce of powder. The negative was fair, but it would not have hurt any had I used more powder.

* * * * *

ACCORDING to the *Bolton Journal*, at the conclusion of the performance of *The Mikado* by the members of the Amateur Operatic Society at the Grand Theatre on Thursday evening, February 25, arrangements were made for taking a number of photographic views of the stage by Mr. N. S. Kay, of Knowsley-street, but were unfortunately interfered with by an accident, which, at the time, was thought would be fraught with serious consequences to Mr. Kay. He was employing the flashlight for the purpose of photographing a group scene, when the compound exploded, seriously damaging the camera, and causing a severe shock and injuries to Mr. Kay. Indeed, at first it was believed the explosion had blinded him, and great alarm and excitement prevailed among the members of the company. Dr. Brown was soon in attendance, and Mr. Kay was removed home; but his injuries, happily, are nothing like so serious as was at first anticipated, burns on the hands being the most serious result of the accident.

LANTERN MEMS.

"THERE was no faking." Such were the expressive words used by Captain Abney in reference to the demonstration of M. Chassagne's method of producing photographs in colour, which took place in his presence at King's College, when he was in company with Sir Henry Trueman Wood. Knowing what wonderful feats of deceptive skill are performed by the Fakirs, this phrase put the question of *bona fides* at once at rest in the minds of the majority of the audience assembled at the Society of Arts to hear Sir Henry Wood's paper on *Colour Photography*.

* * * * *

CAPTAIN ABNEY was opening the discussion after the paper when he used the above words, and, coming from such an undoubted authority on colour, the audience generally must have been convinced of the genuineness of the work, notwithstanding their predisposition to scepticism. So many times has the invention of colour photography been announced during the past ten years that it was as well, in the interests of science, that Sir Henry Wood decided to read a paper on the latest development, and at the same time give a *résumé* of work previously done. While giving the premier position, as far as brilliancy and purity of colour was concerned, to M. Lippmann's results, he could not do otherwise than state they were removed from the practical, on account of uncertainty of production and the fact of the colours only being visible by reflected light.

* * * * *

MR. IVES'S three-colour projections (always beautiful) met with the approbation they deserved, but the audience had come to see the "new" colour photography, and were all attention for the projection of the results: first, of M. Chassagne; and, later, those of Mr. Bennetto. As Sir Henry explained, the examples sent from Paris were not technically good as lantern slides, for the varnish used was not suitable, and the subjects chosen not as good as those examples in larger transparencies exhibited in the library of the Society of Arts and the paper prints which adorned the walls of the lecture hall.

JUDGING by the applause that greeted the projection of the colour transparencies by Mr. Bennetto, the palm most certainly was carried off by the Englishman for results up to date, and, whoever in the end comes to the top, there were no examples in the Frenchman's work to equal the charming sunrise that wound up the series of English photographs, while the figure studies were remarkable for the evenness of the colouring and natural appearance. To be quite fair and impartial, even these have not yet been produced to give the brilliancy of a really A1 lantern transparency coloured by a first-rate artist; but when were first efforts perfect?

* * * * *

THAT the colouring by the Bennetto process is something more than can be done by the greatest master in the art of glass-painting was verified by the marvellous metallic sheen portrayed in the glass stereoscopic slide on view. In this the gold leaf over the neck of the champagne bottle (forming part of the subject, with dessert, fruit, &c. was most natural, as also was the gold or metallic braiding round the costume of the female figure in another transparency. This latter brought the ejaculation, "Wonderful!" from Captain Abney, after examination with a magnifying-glass.

* * * * *

MR. BENNETTO tells me he has no doubt whatever of being able to produce very shortly transparencies where the colour only shall be on the glass, and therefore no degradation of colour truth, richness, or transparency, which is at present due to the photographic base. From what he has already done, I willingly give him credit for the necessary ability to do so, especially as I know some lantern slide artists who are able to produce the desired designs on glass by photography, which, on being coloured, cannot be detected as having a photographic base, and so pass as hand-drawn and painted subjects.

* * * * *

SOME people ask how is it a photographic artist, in an out-of-the-way Cornish town, can have alighted on such a discovery, or obtained the necessary experience to experiment and carry out what must be extensive investigations. Mr. Bennetto has not always been in Cornwall, but has had fourteen years' experience in first-class West-end studios, and it was only when his health broke down through over-work that he went to that Riviera of England, Cornwall, to recruit, and eventually settle there. His investigations in colour photography have, I believe, extended over a period of six years, and, if his ideal of being able to produce a life-size portrait enlargement in natural colours is shortly realised, as he expects, he will be more heartily congratulated than he has already been.

* * * * *

A VERY distinguished company assembled at the Grafton Gallery the night before the lecture at the Society of Arts, to witness the private view of Mr. Bennetto's colour photographs, and, although a few were at first sceptical, I think they went away convinced of the fact of a distinct advance having been made in photography, and fully appreciating the beautiful results. The *Times*, as a rule, is reluctant to give new inventions notoriety, and, in fact, I believe always requires verification by authorities of the particular subject referred to; but, following Sir Henry Wood's article on M. Chassagne's method, their own on Mr. Bennetto's colour photography has, I think, given the official stamp of genuineness to the inventions.

* * * * *

EXIT acetylene, as far as lanternists are concerned, for the re insurance companies have decided not to insure premises where is used unless the generator is placed in a building detached at least ten feet from the nearest point of any other building. This, while making it difficult for photographers and general users to arrange, does not entirely taboo it for places permanently occupied; but where a lanternist has to travel, he cannot arrange such things with certainty, and, moreover, proprietors of halls and institutes will not now permit its use, especially as the companies say "they agree not to admit liability for explosion of acetylene gas occurring elsewhere than in the building which is, or the contents of which are, the subject of the insurance."

No doubt, that acetylene gas gives an excellent light, and one, under proper control, of great value, but the decision of the companies and the Home Office with regard to the storage of calcium carbide has been brought about by the recommendation of the Committee which recently inquired into the subject, and which, to a certain extent, was foreshadowed by a statement made by an expert when giving a series of lectures on gas-lighting, at which he said, "If you don't of your own will keep acetylene generators out of the house, the fire insurance companies will take good care you do." He also said that ninety per cent. of the generators constructed for the market were bad, if not positively dangerous. At some future time, perhaps, its use may be permitted, but it will be well for all pattern generators to be tested and bear some official mark of satisfactory design and construction.

* * * * *

Giant aphengescopes have been in use before, but I recently was present at a private exhibition of something much more ambitious than anything previously attempted, and which is understood to be on the lines of an apparatus said to be giving satisfactory results in Paris. The inventor is a French optician, and places the "subject" in a very strong light, and projects the image on an immense ground-glass screen. In the instance referred to, the light from fourteen powerful arc lights was concentrated on a figure at the back of the stage some twelve or fifteen feet away from the lens, which was fixed in a high framework, and the resultant picture on the ground-glass screen was—well, what might be expected—very feeble and disappointing.

* * * * *

Those that have had to do with aphengescopes or opaque lanterns know what a very small quantity of the light concentrated on the object can be utilised for projection, for, being reflected in all directions as well as the one on which the lens is placed, very few of the light rays reach it, and this when the object is as close as possible to the lens. Now imagine the distance increased to fifteen feet, and the lens one of three or four inches diameter, and then it will be understood how much of the light is lost. If, instead of a full-length figure and accessories, a head and bust had been illuminated, and this placed in a position, say, at most, three feet from the lens, an image bright enough to be seen by 200 or 300 people might have resulted, but to get enough illumination to enable the projection on a ground glass to be seen in a large public hall would mean a light sufficient to blind the subject. In the instance referred to, I quite sympathised with the young woman who posed as the subject. This leads me to the thought of how the eyes of the living picture subjects are affected by the tremendous glare of light, night after night, and it would be interesting for some oculist to, if possible, examine the eyes of a person just starting on this work, and then, say, after three months' posing.

* * * * *

The apparatus was ingenious as having some optical arrangement for showing the image erect instead of inverted. This, I concluded, was the "patent" of the apparatus; any way, I did not inquire "how it was done," but since then have been thinking it out, and concluded it is by a large inverting prism of the order frequently mentioned in this Journal and the Almanac. Now that powerful lights in the shape of the electric arc can be readily obtained, I think that the subject of opaque object projection will pay well to develop; at any rate it will not fail to be an interesting study.

G. R. Baker.

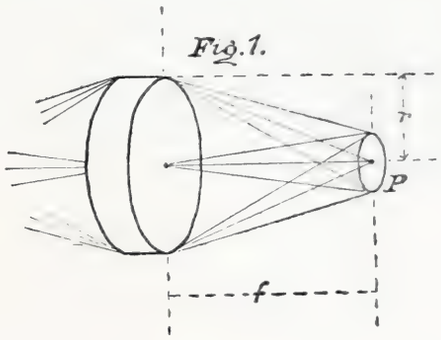
THE CALIBRATION OF AN ENLARGING LANTERN FOR EXPOSURE.

The sale of enlarging lanterns has, of late, become very considerable, and this class of apparatus is much in use during the winter months, both for making enlargements on bromide paper and for making lantern slides by reduction in camera.

All manuals and text-books which give instructions concerning the use of these lanterns carefully explain that, in estimating exposures the square of number of diameters must be taken as a factor. This rule is evidently based on two assumptions, viz., (1) that the total quantity (or flux) of light received by the condenser is always the same, and (2) that the whole of the light is transmitted through the objective.

Neither of the above assumptions is, as a rule, correct. With regard to the first assumption, in order to obtain evenly illuminated discs on the easel, it is necessary to vary the position of the radiant for each and every ratio of enlargement or of reduction. Now, it can easily be shown, either graphically or analytically,

Fig. 1.



that the quantity or flux of light received by a condenser of radius, r, from a radiant at a distance, f, and consisting of a *flat* source of light, is $\pi \times P \times \frac{r^2}{r^2+f^2}$, where P is the candle power of the source (see fig. 1).

Now π, P, and r being constants, and f only being a variable, it is evident that the flux of light received by the condenser will vary as $\frac{1}{r^2+f^2}$. Taking the case of a six-and-a-half inch condenser, the distance of which from the radiant may vary, say, between five and ten inches, it is easy to see that this flux will vary between limits proportional to 100 and thirty-three. In other words, by doubling the distance of the radiant, the flux is reduced to one-third. If the "disc areas" covered and the relative values of the fluxes received by the condenser alone entered into the consideration of the illumination of the discs thrown on the easel, it would simply be necessary to graduate the lamp slide with a scale of factors which, multiplied into the squares of the ratios of enlargement or reduction, would give a series of exposure factors.

Such is, however, unfortunately not the case, for the second assumption above mentioned can only be true when the source of light is of very small dimensions, and when the aperture of the objective is of considerable diameter. The lantern being properly adjusted, the image of the radiant is thrown somewhat in advance of the optical centre of the objective. The size of this image depends upon the relative distances between objective and condenser, and between condenser and radiant.

When the ratio of enlargement is great, the image of the radiant will be small, and then, with a large objective, the whole of the light received by the condenser *may* be transmitted to the easel with such losses only as will be due to absorption and reflection.

As the ratio of enlargement decreases, the distance between condenser and objective increases; the distance between the radiant and the condenser decreases, and the dimensions of the image of the radiant increase, whilst the aperture of the objective remains constant. Consequently the beam of light from the condenser gradually overlaps the objective more and more, and, as the ratio of enlargement decreases, the loss of light, cut off by the front board of the lantern, becomes greater and greater.

The inherent imperfections of the ordinary commercial condensers are sufficiently great to place the amount of this loss beyond the sphere of calculation, but happily a few simple photometric observations will yield the materials for forming a series of exposure factors, and the following example may be of interest.

A six-and-a-half inch enlarging lantern was set up (see fig. 2) so as to project the image of a quarter-plate negative into an enlarging

camera. The radiant was a "duplex" paraffin lamp, and the objective a Wray 5×4, five and a half inch, R. R., stopped to *f*-8.

A cardboard diaphragm was fitted to the ground-glass focussing screen of the camera, so as to cut off all light except that which

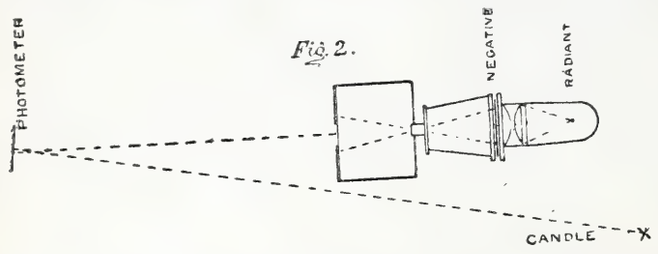


Fig. 2.

passed through the screen and through a circular opening, three inches in diameter, cut in the centre of the diaphragm. A series of observations were then made as follows:—The negative was carefully focussed on the ground-glass screen, the camera and the negative were then removed, and by means of a calico screen stretched on a child's hoop, and placed in the position formerly occupied by the focussing screen, the lamp was adjusted to give the best possible and most evenly illuminated disc. The camera was then replaced with cardboard diaphragm in position. A good sperm candle was then placed in a suitable position behind the lantern, and the shadow of a rod thrown by it on a (white paper) photometer screen was carefully compared with the shadow of the same rod, thrown on the same paper screen by the light issuing from the three-inch hole in the cardboard diaphragm.

By moving the photometer screen, with its rod, to and fro along the optical axis of the lantern and camera, the balancing of the two shadows was an easy matter. The following distances were then measured: photometer screen to focussing screen, photometer screen to candle, radiant to condenser, negative to focussing screen. The ratio of the squares of the two first distances gave the candle power of the three-inch "spot" of light in centre of cardboard diaphragm. The last distance gave the ratio of enlargement.

As ground glass is an excellent diffuser of light, the candle powers of the three-inch "spot" may be assumed to be proportional to the actual axial illuminations of the focussing screen.

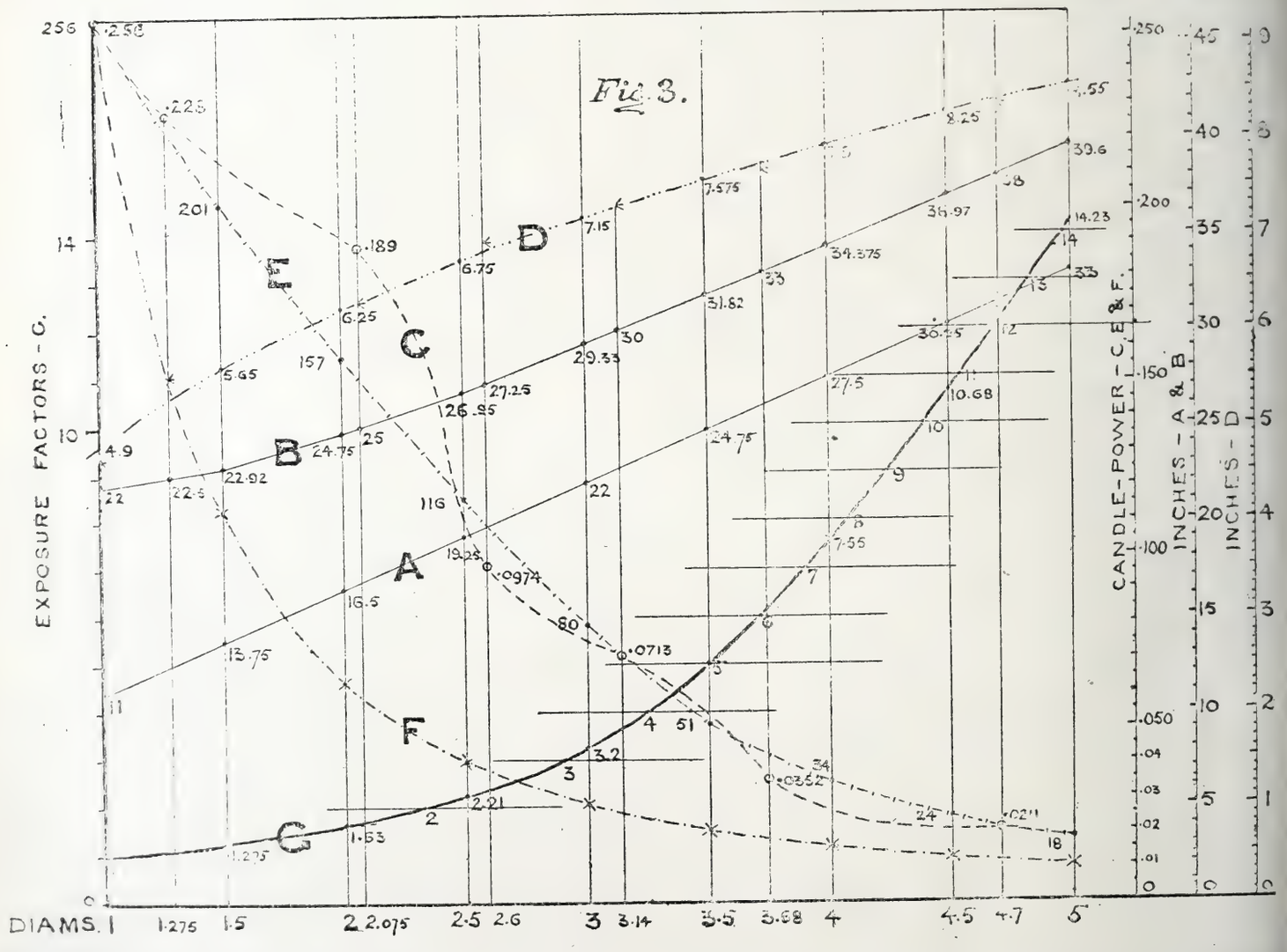
The results are plotted in the diagram (fig. 3).

Curves A and B (A is, of course, a straight line) give the respective distances of lens and negative from the focussing screen.

Curve C gives the candle power of the three-inch "spot."

Curve D gives the distance of radiant from condenser (these distances do not now enter into our calculations, but are given as a matter of interest).

The irregularities of curve C are possibly due to errors of observation, and it is probable that a curve such as E would represent on a



suitable scale, more accurately, the proportions, between the actual illuminations of the focussing screen in its various positions.

Curve F is given simply to show how the illuminations would vary if the "disc areas" covered alone entered into consideration. Curve G is obtained by taking the quotients of 256 and the values given by curve E. This gives a curve of *exposure factors*, the factor being unity, when the ratio of enlargement is unity.

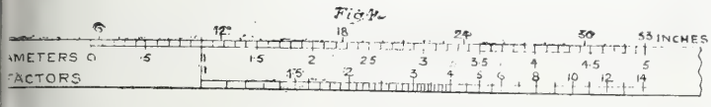
It is regretted that time at disposal did not admit of the extension of this curve of factors for enlargement ratios up to one to ten and for reduction ratios down to three to one.

The application of these factors is, of course, extremely simple. From curves G and A, a lath can be graduated with scales of enlargement ratios and of exposure factors (*vide* fig. 4). When the picture

properly focussed and the lamp adjusted, this lath, applied to the stance between easel and objective, will show both the enlargement tio and the exposure factor at a glance.

For convenience, trial exposures should be made at unit ratio of largement. If, for instance, 24 seconds be found to be a suitable posure at this ratio and with an an *f*-8 stop, then $\frac{24}{4}=6$ seconds ay be termed the "equivalent exposure" with an *f*-4 stop, the U.S.

Fig 2.



umber of which is unity. An enlargement of three and a half ameters being then required, using say an *f*-11 stop, the actual posure necessary will be: *equivalent exposure* × *exposure factor* × *U.S. No. of stop*, or in this case $6\times5\times8=240$ seconds or 4 minutes.

The methods described above might, of course, be improved upon, at there would seem to be no reason why makers should not alibrate their lanterns before delivery to customers, and supply the tter with a properly graduated scale. Much time would then be ained and much expense of wasted sheets of bromide paper saved.

It is hoped, however, that the foregoing is sufficiently clear to nable any intelligent owner of a lantern to work out a scale of xposure factors for himself.

ARTHUR H. BAGNOLD,
Major, R. E.

PAUL'S APPARATUS FOR PROJECTING KINETOSCOPE PICTURES ON THE SCREEN.

[R. R. W. PAUL'S invention relates to an improved apparatus for producing representations of moving scenes, figures or objects, by projecting n to a screen in rapid succession, by means of an optical or magic antern, or other suitable projecting apparatus, a series of photographic ictures of such scenes, figures, or objects, taken in rapid succession, so s to represent the various changes in the appearance of such scenes, gures, or objects.

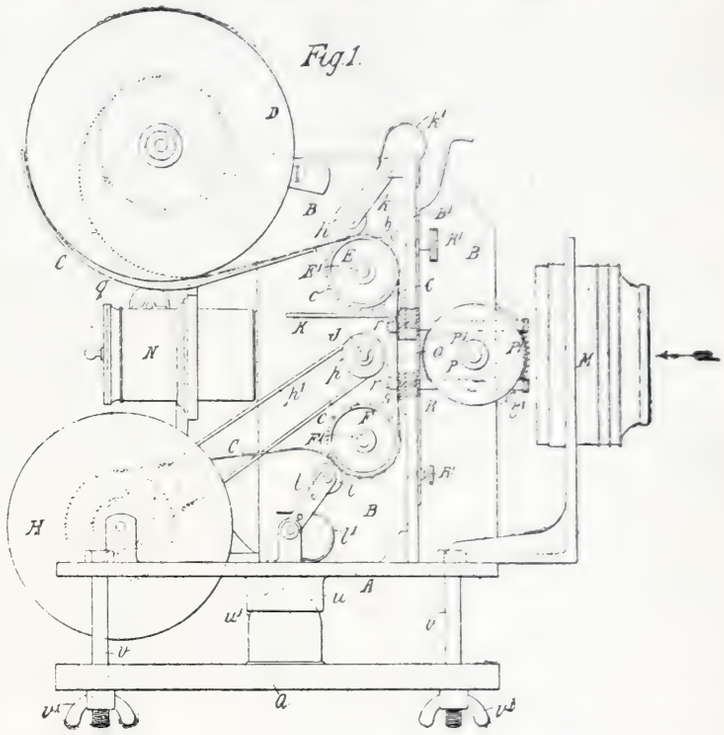
In some of the forms of apparatus heretofore devised for this purpose, band or film has been employed which is intermittently fed over rollers hrough the optical system of a projecting lantern, the light being shut ff by an intermittently moving shutter whilst the film is in motion. he means employed for effecting these motions have, however, been mperfect in the following particulars, *viz.*, they have not held the film erfectly flat and taut and in a fixed position during exposure by ositively controlling its motion both in advance of and in rear of the pening or window through which the light shines to project the picture; onsequently the pictures successively projected do not accurately egister with one another, and they do not lie exactly in the same plane while being projected, and, further, the film is liable to curl or assume a urved form, with the result that the effect obtained on the screen is lurred and unsteady.

"Now, the main object of my present invention," says Mr. Paul, "is o ensure that each picture, while being projected, shall be kept perfectly lat and taut and be rigidly held in accurate register with the preceding icture or pictures, and in exactly the plane which the latter previously ccupied. For this purpose I employ two driving wheels or drums for eeding forward the film or band bearing the photographic pictures, one f which wheels or drums is arranged immediately in advance, and the ther immediately in rear, of that part of the film through which the light hines, and which wheels or drums are adapted to be rotated simultaneusly about their axes by means of suitable intermittent gearing so constructed as to hold the said driving wheels or drums rigidly and correctly n position whilst the pictures are being projected.

"To more effectually ensure the keeping of the said film or band in a lefinite position relatively to the optical system of the apparatus, and revent slackness of the said film or band between the said driving wheels or drums and the spools for supplying and receiving such film or band, I prefer that the said film or band should be continuously pressed gainst a frame around the aperture or window through which the ictures are projected, by means of a series of spring-pressed pads, which, whilst holding it against the said frame, permit of its sliding freely past he same as required. I also prefer that slackness of the film between he second driving drum and the receiving spool or roller should be prevented by a continuous rolling-up tension exerted on the said spool by means of a loose or slipping band which exerts a continuous turning movement on the said spool. The motion of the spool from which the ilm is unwound should also be controlled, in this case, by means of a rake-pad pressing thereon. The tension on the film will then remain pproximately constant whatever may be its position relatively to the pools.

"In the accompanying drawings fig. 1 is an elevation, partly in vertical section, showing one side of my improved apparatus, the parts being illustrated in the positions which they occupy when the film has

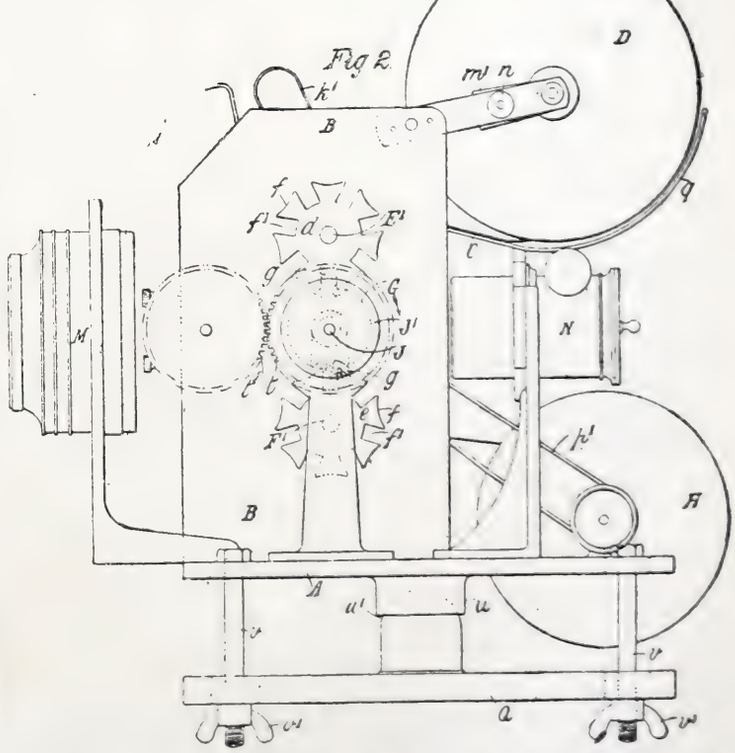
Fig 1.



been moved through one half of the distance requisite to effect a change of the picture.

"Fig. 2 is an elevation, showing the opposite side of the said apparatus.

Fig 2.



"Fig. 3 is a diagram, showing some of the parts in the positions which they occupy when the film is at rest and a picture is being projected on to the screen.

"Figs. 4 and 5 are views, illustrating details of construction, and

"Fig. 6 is a side elevation, illustrating a slight modification of my invention.

"Like letters indicate corresponding parts throughout the drawings.

"A is the base of the apparatus, and B the frame thereof. In the part,

B¹, of the said frame, is provided an aperture or window, *a*, through which the light shines, and in front of which the film, or band, C, of pictures is intermittently fed as hereinafter described.

"The film, C, is provided with perforations along its edges as at *b*, and before use is preferably wound on a spool, or roller, D, and is suitably supported in the frame, B. From the spool, D, the film, C, passes over a driving roller or sprocket wheel, E, the pins or teeth, *c*, of which engage in the perforations, *b*, of the film. After passing in front of the window, *a*, the film is conducted over a second driving roller, or sprocket-wheel, F, the pins, or teeth, *c*, of which engage in like manner with the film. The wheels, E, F, are mounted on arbors, E¹, F¹, which turn in suitable bearings in the frame, B, and which are provided at their outer ends with specially formed gear wheels, *d*, *e*; the teeth of these wheels, *d*, are curved at the ends, *f*, to correspond to the curvature of a disc, G, mounted on the main driving shaft, J, of the apparatus, to which continuous rotary motion is imparted through a pulley, J¹, or in any other suitable manner. The disc, G, is provided with teeth, or projections, *g*, which are adapted to simultaneously engage in notches, *f*¹, in the gear wheels, *d* and *e*, respectively, as shown in fig. 2, and thereby turn the wheels, E, F, through an angle corresponding to the pitch of the consecutive pictures on the film, C. When this motion is completed the wheels, E, F, are immediately locked in position by the engagement of the periphery of the disc, G, with the curved surfaces, *f*, at the ends of the teeth of the

Fig 3.

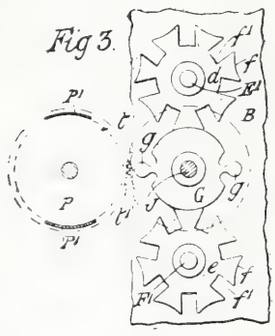
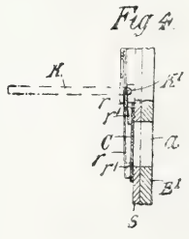


Fig 4.



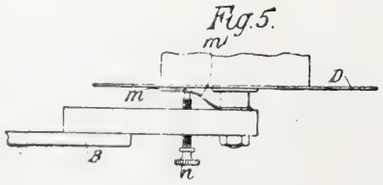
gear wheels, *d* and *e*, as shown in fig. 3, and thus the immovability of the film, C, during the projection of each picture, is ensured.

"After leaving the feed wheel, F, the film, C, is wound on to another spool, H, which is continuously driven from a pulley, *p*, on the main driving-shaft, J, by means of a loose or slipping band, p^1; or the spool, H, may be dispensed with, and the film, C, allowed to descend into a basket or other convenient receptacle.

"In order to retain the film, C, in contact with a sufficiently large portion of the circumference of each of the wheels, E, F, to enable the said film to be fed along without undue pressure on the walls of its perforations, *b*, I provide guide rollers, *h*, *i*, provided with suitable grooves to clear the pins or projections, *c*, and mounted on pivoted frames, *k*, *l*. These frames, *k*, *l*, are acted upon by springs, k^1, l^1, so that the guide rollers, *h*, *i*, can be either pressed against the film, C, on the wheels, E, F, as shown in fig. 1, or held away therefrom, to facilitate the insertion or removal of a film into or from the apparatus.

"The motion of the spool, D, is controlled by means of a brake pad, *m*, mounted on a spring, m^1 (figs. 2 and 5), and pressed against the side of the said spool by means of an adjusting screw, *n*. By this means, any over-running of the spool and consequent slackness of the film, when the said spool is set in motion by the said film, is entirely prevented, the tension of the said film being regulated, as desired, by means of the adjusting screw, *n*. A guide, *q*, covered with velvet or other soft material,

Fig. 5.



is also provided, to receive the film whilst being adjusted in the apparatus and prevent its coming into contact with parts thereof liable to injure it.

"The part of the film, C, passing before the window, *a*, is maintained in a constant position relatively to the optical system of the apparatus, by its being kept taut by the two sprocket wheels, E, F, and also by means of springs, *r*, provided at their ends with presser pads, r^1, which bear against the borders or edges of the film, C on either side of the picture and press it against a frame, *s*, arranged around the window, *a*. The pads, r^1, can be withdrawn from the film, C, by the cam lever, K, which, when turned about its axis, causes the springs, *r*, to be pressed outwards by the cams, K^1 (fig. 4); the film can then be readily removed from the apparatus and another film substituted therefor.

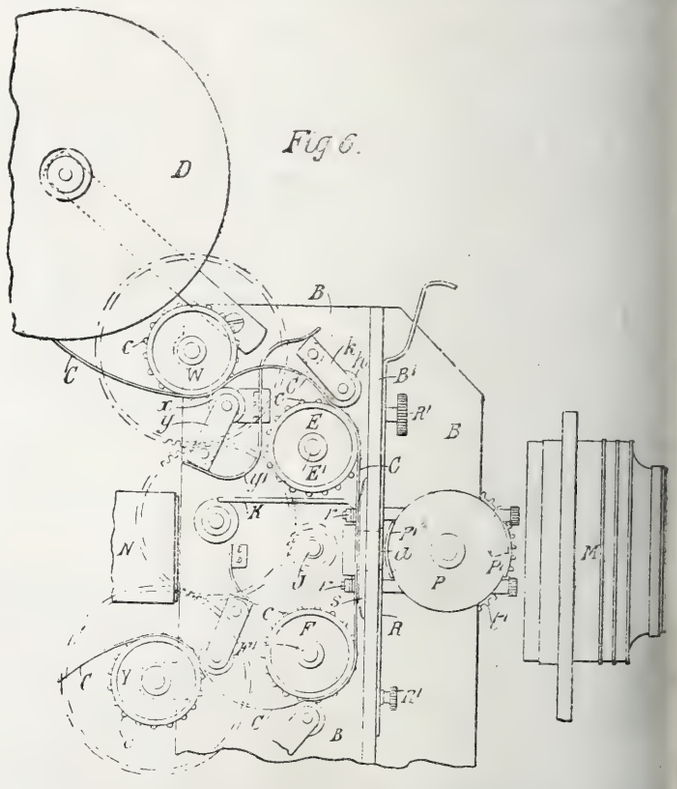
"The optical system preferably consists of a condenser, M, and objective, N, which may be of any suitable construction, the light passing in the direction of the arrow in fig. 1 from a suitably arranged source, such as an electric arc light, an incandescent cylinder of lime, &c.

"The light is cut off during the motion of the film either by means of a flat disc shutter having two apertures or slots, or by means of a rotating shutter, P, comprising two curved plates or segments of a cylinder, P^1, and preferably arranged between the window, *a*, and the condenser, M; it may, however, be arranged in any other suitable position. The segments, P^1, shut off the light as shown in fig. 1, while the film is being moved, but allow the light to pass between them, as shown in fig. 3, while the film is at rest. This shutter is mounted in suitable bearings in the frame, B, and is continuously rotated through spur gearing, *t*, t^1 (fig 2), from the main driving shaft, J. A perforated slide, B, fig. 1, capable of being fixed in any desired position by means of adjusting screws, B^1, is provided for varying the position of the window or aperture, *a*, as required.

"I also provide means whereby the inclination of the apparatus may be varied so as to obtain the best effects on any given screen. For this purpose the base, A, of the apparatus is provided with a cup-shaped seat, *u* (fig. 1), resting on a hemispherical surface, u^1, and is secured at any desired inclination relatively to the supporting table, Q, by means of bolts, *v*, provided with wing nuts, v^1, and passing through holes or slots in the base, A, and table, Q.

"In using the apparatus, the film, C, is inserted into the same so that the pictures register with the window, *a*, and the main driving shaft is turned in the direction indicated by the arrow in fig. 2, by means of an electro-motor or by hand, or by other convenient means whereby an equal turning movement may be obtained; the pictures will then be projected on to the screen in rapid succession, the window, *a*, being closed

Fig 6.



by the shutter, F, during each movement of the film and being open while the film is stationary, and the rate at which the film is fed being arranged so as to produce the best effect.

"Instead of connecting the upper sprocket wheel, E, directly to its axis, I sometimes mount it loosely on its axis and connect it therewith by a spring tending to press the wheel against a stop on its axis but which will yield under a predetermined pressure, so that the said sprocket wheel is capable of a small angular movement independently of the sprocket wheel, F, to compensate for variations in the pitch of the holes in the different films or bands, thus obviating any liability to either over-stretching or undue slackness of the film between the two sprocket wheels, E and F. The apparatus constructed as above described I sometimes use as a camera for producing the photographic pictures on the films or bands, in which case I prefer to use a shutter of disc form instead of the shutter shown in the drawings.

"To more effectually ensure the accurate operation of the apparatus, I sometimes employ, in conjunction with the two sprocket wheels above described, another sprocket wheel, W (fig. 6), which also engages with the film or band, C, and which is arranged to be driven continuously from the driving shaft, J, at a lower speed than the sprocket wheels, E,

which are, as above described, rotated intermittently. This auxiliary sprocket wheel, W, serves to continue the drawing of the film from the spool, D, while the wheels, E, F, are at rest, so, that when the latter again begin to rotate, a portion of the film or band of sufficient length will be free to be fed forward by the same. In combination with the wheel, W, I provide a presser roller, x, mounted on a pivoted arm, y, acted upon by a spring, y^1.

"In some instances, I also provide another auxiliary sprocket wheel, Y, similarly arranged between the sprocket wheel, F, and the spool, H. By these means I make the apparatus reversible, so that, after the film has been unwound from the spool, D, and wound upon the spool, H, its motion can then be reversed so as to exhibit the pictures successively in inverse order. The mechanism can in this case be rotated alternately in either direction, either by hand or by a suitable electric or other motor.

"The claims are :—

"1. An apparatus for the purposes above specified, comprising intermittently rotating sprocket wheels engaging with the film or band both in advance and in rear of the opening through which the light shines.

"2. The combination, with the intermittently rotating sprocket wheels, engaging with the film or band both in advance and in rear of the light opening, of a frame surrounding the said light opening, presser pads for pressing the film or band against the said frame, and means for temporarily withdrawing the said pads from the film or band.

"3. The combination, with the intermittently rotating sprocket wheels engaging with the film or band both in advance and in rear of the light opening, of a spool for receiving the film after use, arranged substantially as hereinbefore described so as to continuously exert a suitable tension on the said film.

"4. The modification of my invention, in which the intermittently rotating sprocket wheel in rear of the light opening is mounted so that it is capable of turning about its axis through a small angle, and is held against a stop on its axis by a spring.

"5. The combination, with the intermittently rotating sprocket wheels engaging with the film or band both in advance and in rear of the light-opening, of an auxiliary continuously rotating sprocket wheel also engaging with the film or band.

"6. An apparatus for the purposes above specified, provided with intermittently rotating sprocket wheels engaging with the film or band both in advance and in rear of the light opening, which apparatus is so constructed that the film or band can be fed through the same alternately in either direction."

THE MANUFACTURE OF ACETYLENE.

Since the explosions of acetylene gas that took place some time ago in Rue Championnet, Paris, in Lyons, Berlin, and other places, says the *Engineer*, the advocates of the employment of this new illuminant have had some difficulty in reassuring the Continental public as to its safety. The most convincing reply to the arguments of detractors has just been made by M. Raoul Pictet, who was the first manufacturer to insist upon the merits of the liquid gas, and the blowing up of his works has not shaken his belief in the future of compressed acetylene in the slightest degree. He gives the results of his experience with liquid acetylene gas extending over a period of more than three years, and says that he is prepared to prove every one of his statements by actual experiment. After pointing out that two processes are necessary, first in manufacturing the calcium carbide and then the acetylene, he says that there is no danger in the production of the carbide, which only needs a furnace of varying form and dimensions, according to the method employed, and the only dangers to be feared are those inherent in electric currents and the possibility of combustible matter in the neighbourhood of the furnace catching fire. These dangers, however, may be avoided by ordinary precautions. Once the carbide is manufactured, it has to be kept dry by enclosing it in a metallic case which is perfectly airtight. Unless the case be damaged and water is thrown upon the carbide, there is no possibility of accident, either when kept in stock or in the course of transport.

Acetylene is manufactured by the direct contact of water with the carbide. In gradually increasing the quantity of water, the temperature of the carbide is raised, and the chemical reaction becomes complicated, with the result that the acetylene is impure and mixed with other bodies. This raising of the temperature may be sufficient to cause spontaneous combustion of the acetylene. This, says M. Raoul Pictet, undoubtedly constitutes a danger. After proving this by numerous experiments, he affirms that he has discovered the means of completely eliminating the danger. All that is necessary is to drop the carbide into cold water, and remove from the water the quantity of heat equivalent to that caused by the chemical reaction of the carbide when it is dropped in. The process of cooling the water is very easy, and in this way there is no danger whatever in the manufacture of acetylene, which is, at the same time, remarkably pure. After purifying the gas by chemical products, it is left so pure that it is capable of being liquefied at from six to eight atmospheres. During this stage of manufacture the heat naturally caused by the compression of the gas is entirely avoided. M. Pictet asserts that he has obtained several thousands of kilogrammes of liquid acetylene under constant pressure in his apparatus without ever having the slightest accident. The liquid acetylene is then introduced into steel cylinders, which undoubtedly constitute a danger in the event of their being left in a building that may catch fire; but in such a case they, of course, merely add to the elements of the fire already existing. Exactly the same conditions prevail with the carbonic acid cylinders, which circulate by hundreds of thousands on all the railways throughout the world, and it only remains to be seen whether these inconveniences are more considerable than the advantages.

Before an accidental explosion can take place, it is necessary that the temperature at any point inside the steel cylinder should be raised above 500° C. in order to decompose the liquid, and it is very improbable that this could take place in the ordinary employment of the gas. The accident in the Rue Championnet, which has been made so much of as proving the dangers of liquid acetylene, was due, says M. Pictet, to two mistakes. In the first place, the workmen thought the cylinder was empty, whereas it appears to have been full, and was returned by mistake among a lot of empty cylinders from Belgium, where they had been employed for public lighting. Then the workmen employed great force in unscrewing a nut carrying the tap by means of a long spanner, and this work was entirely prohibited upon cylinders containing acetylene. The effort employed raised the temperature inside the cylinder, and caused the explosion. In future this nut is to be soldered on to the cylinder, so that the workmen will have no excuse for touching it. We confess that we have some difficulty in following the explanation, as we cannot understand how unscrewing a nut could make it red-hot; and, according to the statement quoted above, a temperature less than 500° C. would not bring about an explosion.

The acetylene thus manufactured, continues M. Pictet, either as a gas or as a liquid, presents only one danger, that is to say, an accidental escape of gas, which, mixing with the air, may, on ignition, cause an explosion. This danger exists in the same degree in ordinary gas, so that he does not think that this would warrant any suppression of acetylene for illuminating purposes. He claims, moreover, that it is not so poisonous as ordinary gas, as, being deprived of carbonic oxide in the course of manufacture, it does not cause any inconvenience. The liquid acetylene is especially applicable for the lighting of railway trains, tramcars, carriages, &c. Contained in a small volume, it has an enormous reserve of illuminating power, and M. Pictet asserts that he has carried out thousands of public and private lighting contracts without ever having a single accident from this new system. For towns, villages, and mansions, however, where pipes are already laid, he says that it is preferable to employ acetylene in the form of a gas. An inflammation of the gas at any point is purely local, and does not extend throughout the whole system of pipes. M. Pictet is convinced that acetylene is destined to take first rank among illuminants for public and private use, and he is prepared to prove to competent authorities the absolute safety of the gas by an exhaustive series of experiments.

COMBINED PHOTOGRAPHIC AND COLOUR-PRINTED PRINTS: SCHMEER'S METHOD OF PRODUCING.

Herr Wilhelm Schmeer says that in certain branches of photography, such as the production of costume pictures, of stage actors, naval and military officers, and the like, wearing uniforms or fancy costumes, it is not always convenient for the person to appear in the costume in which he would prefer the figure of the body to be reproduced, and various methods have been adapted to overcome this difficulty, amongst which is the production of a large quantity of body pictures without the head, and afterwards adding the head thereto by pasting one on to the print. Another well-known method is to photograph the head or other part of the body on to an existing photograph, and print copies of the whole as one entire picture.

This invention refers especially to the production of pictures in which several figures or colours may or are required to be introduced, such as fancy-dress costumes, soldiers, and like uniforms where the head only is required to give an individuality or true likeness of the person or persons photographed.

This new process or method consists in a novel combination of printing and photography, and may be accomplished in the following manner: Before the paper on which it is intended to take a definite positive picture has been sensitised, or otherwise prepared by the usual photographic process, the paper is submitted to one of the usual printing processes for either black or colours, for the body portion of the picture, a blank space being left for the head, or, if more figures are on the same pictures, a corresponding size of space or number of spaces are left for the heads.

The paper is then treated in a manner to sensitise same for photographic purposes, and afterwards placed in the frame for printing the head or heads.

It will be obvious that only that part of the paper on which the head or heads to be photographically printed is to be sensitised, or that a special plate be prepared in such a manner that the light cannot penetrate or pass through the plate except the portion or portions of the negative containing the head or heads, thereby, on exposing the sensitised portion to the light through the prepared negative, the head or heads and such

parts only is or are printed on the paper or the like required to complete the picture for giving an individuality or true likeness of the person or persons dressed in the costume or uniform desired.

Photographs taken on paper prepared in this way result in an entirely even picture, rendering it difficult to detect the joining between the printed and photographed portion of the picture, and, as the greater portion of the picture is prepared by colour or other press printing, the expense for photographic plates is considerably reduced, they being only required of such size as to be large enough for the head or heads.

Glass or other material which can be printed or photographed upon may be utilised, by subjecting the said material to the same combined process, by which process the producing of quantities of pictures may be obtained which are only partly identical with each other, by first printing the parts in which they are identical on paper, glass or other material, and afterwards treating a portion of the material to one of the usual methods of rendering it sensitive to the light, and photographing the vacant part for completing the print.

The claim is :—

The method of producing prints, in which one portion is prepared by the ordinary process of black or colour printing, and treating the remainder or head unprinted portion of the paper or the like by the photographic process of sensitising and printing.

FRAMES FOR INSERTING PHOTOGRAPHS, PICTURES, PRINTS, AND THE LIKE THEREIN: BUTE'S IMPROVEMENTS.

The following is Mr. George Butes' method of inserting from the front photographs, pictures, prints, and the like, under glass in a frame, or frame fixed on or attached to, a box or the like, such photograph, picture, print, and the like, to be seen through the glass, E F, the glass being shut down on top of, and next to, such photograph, picture, print, and the like.

A. Attaching one edge of the glass, E F, to the frame, D, by a hinge or pivot of any material "A" fig. 1 (back view) keeping the glass, E F, in position, and shut down on the photograph, picture, print, and the like, by means of a spring or springs, or other wedge or wedges, B, fig. 1 (back view), the glass being released by pressure from the back, thus

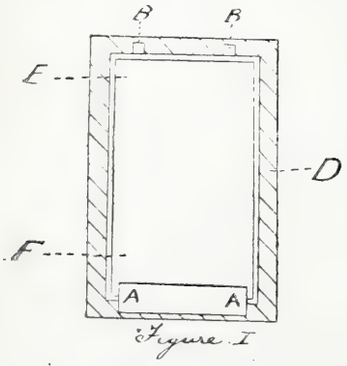


Figure 1.

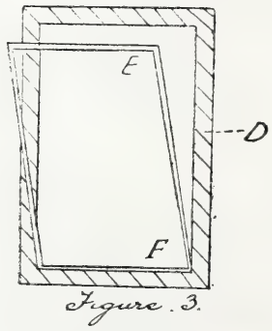


Figure 3.

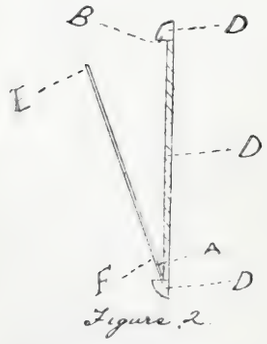


Figure 2.

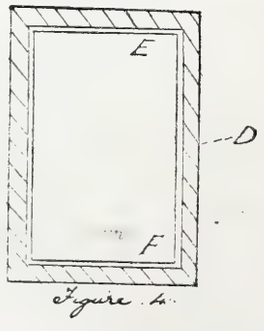


Figure 4.

allowing it to be turned outwards on its hinge or pivot, A, as in fig. 3, sheet 2, of the accompanying drawings for the placing of the photograph, picture, print, and the like, immediately under and next to the glass, E F, the glass, E F, being replaced and secured in position as shown in fig. 4, sheet 2, by like action from the front.

B. By fixing glass in a rim and attaching such rim to the frame in manner and action described in section A.

The claim is :—

Fixing of the glass in frames so as to allow the glass to open frontwards on hinge or pivot and the like, for inserting photographs, pictures, prints, and the like, the glass being held in position by means of a spring or springs, or wedge or wedges, being released or replaced by pressure as described in section A.

PANORAMIC-VIEW CAMERAS: JEFFERY'S IMPROVEMENTS.

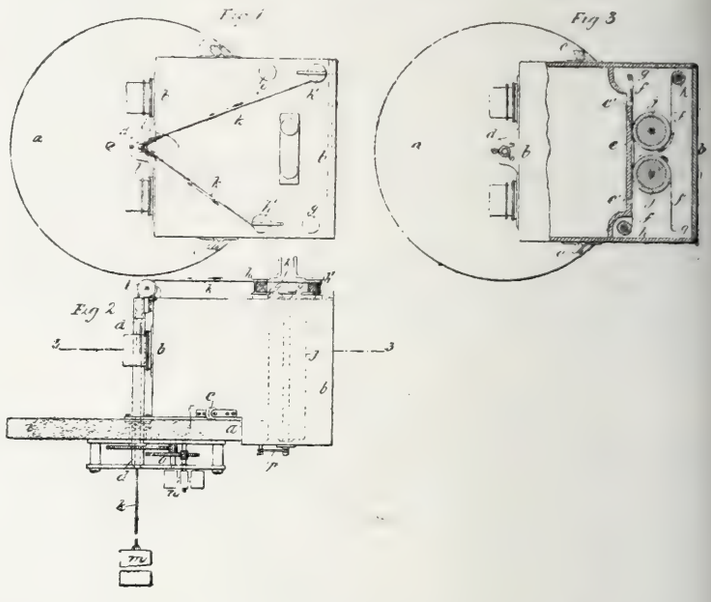
The object of Mr. L. Jeffery's invention is to provide a photographic camera which can be utilised to take panoramic views.

To do this, he mounts the camera on a stand, with a circular top, around the centre of which the camera can be turned at a uniform speed by a suitable clockwork arrangement.

While the camera is making its revolution, the sensitive film on which the picture is taken is passed in front of an aperture in a diaphragm within the camera, which aperture may be adjustable to expose the film for a longer or shorter period, as may be necessary.

Fig. 1 is a plan, fig. 2 a side elevation, and fig. 3 a horizontal section on the line, 3—3 (fig. 2), of a double camera, constructed according to this invention.

a is a disc, having a roughened edge, and supported on a stand or legs, which are not shown; *b* is the camera, supported on rollers, *c c*, running on the disc, *a*, and by the hollow vertical shaft, *d*, which works in a bearing at the centre of the disc; *e* is a diaphragm in the camera, and e^1 e^1 are slots in it; *f f* are the sensitive films, which, when the camera is in use, are wound off from the bobbins, *g g*, on to the bobbins, *h h*, passing around the rollers, *j j*, covered with indiarubber, and past the slots, e^1 e^1; h^1 h^1 are reels or pulleys at the top of the bobbins, *h h*, upon which the cords, *k k*, are wound. These cords pass over pulleys, *l l*, at the top of the shaft, *d*, down through the shaft, and are connected to a



weight, *m*. This weight, in falling, turns the bobbins, *h h*, winding up the films, *f*, on them, and the films, being nipped between the rollers, *j*, and the roughened edge of the disc, *a*, drive the camera around the disc, and one of them is also strained tight between the roller and the bobbin, *h*, by reason of the revolution of the camera being retarded by a fly, *n*, driven from the shaft, *d*, by a train of clockwork, *o*, or it might be from the edge of the disc. The other film is kept strained between the roller, *j*, and the bobbin, *g*, by reason of the friction of the latter in its bearings. The fly, *n*, is preferably made adjustable, so that the speed of revolution of the camera around the disc, *a*, can be regulated; *p* is an indiarubber spring, pulling the roller, *j*, towards the disc, *a*.

The diameter of the disc, *a*, is so proportioned that the image of any object shall travel at the same speed as, and therefore remain stationary relatively to, the film.

It will be seen that the invention is applicable, not only to single-aperture cameras, but also to double cameras for taking stereoscopic views, and it is especially useful for taking panoramic views suitable for the stereoscope.

The claims are for :—

1. Driving the camera by means of the film.
2. The combination with the disc of means for driving the film, for pressing it against the edge of the disc, and for retarding the revolution of the camera.

German Patents.—The number of patents applied for at the German Patent Office in 1896 amounted to 16,486, an increase of 1423 over the previous year. The most remarkable feature of the past year was the extraordinary increase in the number of patents applied for in connexion with the gas industry, the cause of which appears to have been the success that has attended incandescent gas lighting.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*April* 2, 1897.

THE LANTERN RECORD.

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LANTERN MEMS.

LANTERNISTS have reason to be proud of the use to which their favourite apparatus has been put during the last two months, especially as regards the lectures of "the lion of the season." Dr. Nansen has created a *furore*, and received such marked support as seldom falls to the lot of even the most successful explorer or traveller. From his first appearance at the Albert Hall, when he lectured to the Royal Geographical Society, and received at the hands of His Royal Highness the Prince of Wales the gold medal of the Society, until a day or two before he left the shores of England, it was one round of lecturing. I believe one week he gave no less than eight lectures, and each was attended to overflowing.

* * * * *

PERSONALLY I had two opportunities of hearing him, but was only able to avail myself of one, and that the last evening lecture at St. James's Hall. It was certainly an event to remember, the enthusiastic audience, the splendid specimen of manhood in the lecturer, his thrilling narrative, so modestly told, and last but not least his excellent photographic illustrations of *Farthest North* life, difficulties and pleasures. I have no doubt most people have read some account of the results achieved and the doings of the captain and crew of the *Fram*, and the wonderful performance of the vessel when "pinched" by the ice as no vessel was pressed before, and yet came out safely, so shall content myself with speaking of the apparatus and illustration.

* * * * *

GIANT screens have been the order of the day, for at the Albert Hall it was something like a thirty-eight feet screen, and at the Free Trade Hall, Manchester, about thirty-five feet. In the first case limelight was used, and in the latter the electric light. Of course, where audiences are so large, the size cannot be made perfect for all equally; for, while those seated at the middle and end of the hall enjoy the pictures in proper proportion, and with correct perspective and angle of view to give a natural scene, those near are at a disadvantage, and get exaggerations. It is impossible for managers to arrange so that all their clients have an equally good view, and they therefore err on the side of magnitude of picture, so that those at the farthest end of the hall may be able to see.

* * * * *

LONG-FOCUS lenses for the apparatus have been a necessity. At Manchester the lantern was one hundred and twenty feet away from the screen, and a lens of fourteen inches equivalent focus used. At St. James's Hall a special apparatus had to be engaged, with a front lens of eighteen inches equivalent focus. Notwithstanding these great distances and length of lens focus, the light was considered satisfactory. It will be interesting to have some detail of the difficulties of photographing Arctic subjects, and the kind of apparatus most suitable for the work. The developing was, no doubt, left until the expedition returned to Europe, or at least to a more temperate climate than that found at 84° or 86° N. latitude. If, in order to get gloves and socks thawed and dried to put on next morning, Nansen and his only human companion (Johannsen) on his sledge journey had to place them on their chests at night, one need not ask about that section of the expedition; but probably those remaining on the *Fram* were more favoured as to temperature. I should think frozen gloves and under garments on one's chest at night were the nearest approach to "the icy hand of death" without losing vitality altogether.

* * * * *

BESIDES Nansen, we have had the Jubilee Commemoration lectures at the Crystal Palace, when Sir Robert Ball expounded on astronomical discoveries during Her Majesty's reign, and Captain Abney in like manner showed what progress had been made in photography in sixty years, including the latest development of "Colour Photography," illustrating same with examples by Mr. Bennetto. To show what marvellous assistance photography had been to astronomical science, Sir Robert Ball said that photography was as much in advance of visual telescopic observation as that was over vision by the naked eye; in fact, photography was ten times as great in sensitiveness as the most sensitive human eye.

* * * * *

ONE very telling photograph projected on the screen was from a negative of one of the plates forming a unit of the star map of the heavens, and this represented dots of light all over the surface, so that on a large screen (about twenty feet square) it seemed that not a place could be found to put a point without touching a star. It can be imagined how mighty is the universe, and the magnitude of the undertaking, when ten thousand similar plates at least will be required to complete the star map.

* * * * *

I HAVE several times mentioned large films in connexion with animated photographic apparatus, but it has been left to the Americans to show London audiences the most perfect results yet obtained. I had occasion to be at the rehearsal of "The American Biograph" at the Palace Theatre of Varieties, and the results were certainly an "eye-opener." The projections were on a very large screen, the size of the proscenium, and the illumination excellent. The apparatus, which I had an opportunity of cursorily inspecting, is much larger than usual in apparatus of the cinematograph type. The films are about 220 feet long for each subject, and the separate photographs making up the moving picture are nearly the size of ordinary lantern slides.

The press opinions on the "Biograph," now it has been put on the regular bill of the Palace, are of a distinctly complimentary character, while the management are so satisfied with its reception by the public that they have trebled the original engagement, and now all interested will be able to see the results, with periodical variation of subjects, for the next six months. The makers of the apparatus are Messrs. Marvin & Castler, New York, while the European agent is Mr. Koopman. Altogether twenty-six machines have been made, of which twenty-five are, I believe, in use in America. As a specimen of the go-a-headness of our American cousins, it may be mentioned that films of the presidential inaugural ceremony, taken on March 4, were reproduced, sent to this country, and shown to the London audience (at the Palace Theatre) on March 22.

* * * * *

The films used have no perforations, and the shutter is such that the minimum of light is stopped back and also the least possible amount of flicker. It passes over seven or eight rollers, and is got into register by a dummy piece of film, opaque or nearly so, that separates each subject. An electric motor drives the apparatus, and after it passes between the lens and the light at about forty exposures a second it is wound up on a large roller. The whole of the twelve subjects used for one entertainment are in one continuous length when joined to the blank pieces referred to, and so large does it look when coiled that, at first, one's mind runs to a coil of firemen's hose as a simile. I say at first advisedly, for it is not so large as that; but, after being used to the kinetoscope size of film, it does look immense.

* * * * *

By the time of the Diamond Jubilee there should be some good apparatus available for obtaining a record of this unique historical event, and if Queen's weather prevails, as some prognosticate and all hope, some good pictures should result. If ordinary seats to view the procession are fetching the high prices they are now, stands for animatographing, if on private property, will be prohibitory. No doubt, royalty, who are already much interested in this class of work, will, with their usual consideration and forethought, grant facilities for a limited number of "Animato-artists" to secure pictures. Positions suitable may be difficult to obtain, especially near St. Paul's where the light will be adverse for places directly in front of the Cathedral (on the steps) and in its precincts. G. R. Baker.

PHOTOGRAPHIC WORKERS AT WORK.

XIII.—Mr. Birt Acres at Barnet.

The Northern Photographic Works at Barnet is the scene where, for something like two years, Mr. Birt Acres has been busily engaged in cinematoscopic work. Cameras for taking continuous photographs of moving objects, the application of the same mechanical principle to the projection of the pellicular transparencies on to the lantern screen, the development of the many interesting negatives obtained of popular and notable scenes, and the production therefrom of the transparencies for exhibition purposes, have recently made Mr. Acres an extremely busy member of the photographic world. And not only may he rightly claim to have given in this country the first public exhibition of animated photographs, but his productions entirely emanate from his own works, the sensitive film being prepared and coated by his resident staff, so that he very properly boasts of his cinematoscopic pictures being, from start to finish, made at Barnet.

Last week we formed one of a party that journeyed to Barnet with the object of having demonstrated to us how cinematoscopic photographs are produced. The day was exceptionally bright and fine, and this fortunate circumstance enabled Mr. Acres and his assistants to obtain a very successful animatograph of the half-dozen gentlemen who had responded to his invitation. The photograph was taken out of doors, and it is highly probable that many of our readers may, before long, have the opportunity of scrutinising it upon the screen.

We may here say that Mr. Acres has accumulated a large and valuable stock of animatographs, taken in various parts of the world, and his alertness in securing fresh and attractive subjects was demonstrated to us by the exhibition of a negative obtained only a day previous to our visit. This was an animatograph of the Cambridge crew at practice on the river Thames. The operator followed the crew in a launch. The water wa lumpy, but a perfectly sharp result was obtained throughout the serie of tiny photographs, and we have no doubt that, on the screen, th journey of the boat's crew up the river, the approach of Hammersmit Bridge, and the passage underneath that structure will look strikingl effective.

Animated photography, thinks Mr. Acres, will not long survive as music-hall attraction, but he is firmly of opinion that it has a good futur before it as an adjunct to the lantern, and it is in this direction, we gathe that his efforts are now more particularly directed. Should his forecas prove correct, not only will animated photography be sure of a permanen place for entertainment and other purposes, but the public, to which i will appeal, will be practically unlimited.

The film used by Mr. Acres is, as we have already said, coated a Barnet. At present it is exclusively confined to home use, but w understand that it will shortly be placed on sale, and available to an workers of cinematoscopic apparatus having the standard gauge. W witnessed the coating of the film. As the emulsion sets, the filr is guided on to a huge wooden drum, inclined at an ang'e to th coating room, and is wound round the drum, in which position th emulsion dries in the course of a few hours. Several hundreds of fee are wound round the drum in this manner. Considerable novelty an ingenuity are brought to bear in the actual method of coating th celluloid, but of this, and of many other useful devices involved i the preparation of the film, it would not be fair to Mr. Acres to write Suffice it to say that, as the result of his experience, he has bee enabled to greatly simplify the manufacture of the film, so that it preparation has now become a matter of great ease and certainty, whil its use is unattended by difficulties or drawbacks.

The printing of the positive transparency from the negative film wa demonstrated. The plan followed appeared to be simple, effective, an ingenious. Artificial light is used, and it is completely boxed in, wit the exception of a small rectangular aperture, upon which the light i concentrated by means of a condenser. The pellicular negative is woun off by a series of wheel movements in front of the aperture, having i contact with it, film to film, the sensitive strip on which the transparenc is to be made. A uniform rate of speed is given to the films as they pas in front of the aperture, a metronome governing, as it were, the motio of the hand on the turning wheel.

The plan adopted for the development of the films is also strikingl simple. In two upwright wooden supports a rectangular wooden fram is swung so that it may be easily revolved. The top and bottom of thi frame are studded with small wooden pins, in which the films engage a the perforations. Upon this frame the film is wound, being held i position by the wooden pins, the film side being kept outwards. Th ends of the film are secured by small tacks, and when the whole of th frame has been covered you have a light wooden frame carrying a larg number of feet of film, held perfectly taut, and occupying a very sma space. For development, vertical trays capable of holding a thousan ounces of solution are used; the negatives are also fixed and washed i trays of similar construction. We noted that a grain of pyro per oun of solution was used, development being conducted slowly. This metho of developing continuous lengths of films appeared to be as effective as i is simple.

In conclusion, let us wish Mr. Acres the success he undoubtedl deserves. He has had two years' hard work at animatography, and w are sure our readers will join us in our good wishes.

FINDERS.

[Read before the Photographic Club.]

At the commencement of that season of the year when outdoor worl claims the attention of very many photographers, little excuse i perhaps needed for a paper which deals with a part of the apparatu that is of special use in very rapid photography, viz., the view-finder Considered particularly as an adjunct of the hand camera, its importanc is as obvious as its utility; and it is therefore permissible to expres surprise that so little endeavour is made to treat it with the same degre of scientific care as is bestowed upon other parts of the camera.

A view-finder may be defined as an instrument for enabling th photographer to judge, at the moment of exposure, of the position on th focal plane of the whole, or a portion, of the subject to be photographed Broadly speaking, therefore, it is a supplementary, or duplicate, camera and its uses are by no means confined to hand-camera work, as we shall subsequently see. With regard to the employment of finders in

hand cameras, we may now, I think, assume them to be generally admitted as indispensable, if it is desired to remove, as far as possible, the elements of uncertainty from the exposure of the plate. Doubt was formerly cast on their utility by many able photographers, to whose opinions on the subject, however, the verdict of experience has not been favourable. It takes an exceptional degree of skill to tell, without some such assistance as that of a finder, not only the amount of view included by the lens, but also the precise position of the principal objects on the plate.

My own experiences of attemping to take hand-camera photographs without a finder incline me to think that those who can successfully dispense with one are either very fortunate or extremely skilful in the manipulation of their cameras; and, as observation has shown me that photographers are frequently deficient in both these respects, you thus have, off-hand, an overwhelming argument in favour of the use of finders.

Non-lenticular Finders.

Finders are of two classes, (1) non-lenticular and (2) lenticular. In the first the camera itself fulfils, to some extent, the functions of a finder; in the second, a supplementary image of the view to be photographed is formed by an auxiliary lens. Probably the simplest form of finder is that in which, on the top of the camera, a line A B, equal to the focal length

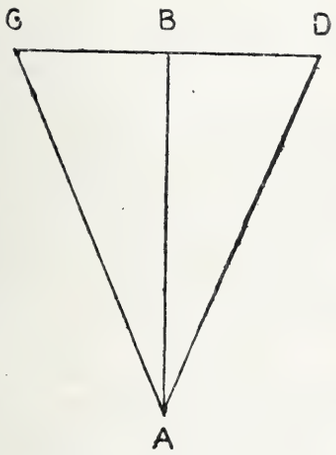


Fig. 1.

of lens, is drawn, and lines A C and A D are also drawn. If the camera be held so that the eye rests at A, the amount of included subject and the positions of objects on the focal plane may be estimated with a fair degree of accuracy. Mr. Chadwick, in his hand cameras, utilises this principle by placing brass pins at A, C, and D.

Both the plans mentioned necessitate the eye being placed close to the top of the camera, a condition also necessary with a third form of non-lenticular finder which is occasionally seen on modern hand cameras. This, which was described in Monckhoven's *Optics*, published thirty-one years ago, and has been since reinvented in Germany and elsewhere, consists in erecting on the front of the camera above the lens a folding square frame, the exact size of the plate, with cross wires, and a folding eyehole piece at the posterior end of the camera, that is, over the focal plane. The distance between the frame and the eyepiece must be equal to the focal length of the lens, and it is therefore obvious that, by looking through the eyehole to the upright frame, you get a measure of the view angle of your lens, while the cross wires enable you to locate the positions on the plate of moving or other objects. It is, of course, a direct view-finder. These three systems are unquestionably useful both for stand and hand-camera work, although in the latter respect the full extent of their usefulness would be more appreciated if hand-camera users, with greater frequency, held their cameras up to their chins when taking their photographs, instead of under their arms.

Double and Twin-lens Cameras.

Long before the hand-camera era an effective form of finder adopted was that known as the double camera—which is not, however, to be confused with the twin-lens camera. The double camera, as its name implies, consisted of two cameras superposed, and working by a common focussing motion, the lenses being of identical foci, and the ground glass of the upper camera allowing of an inspection of the image up to the moment of exposure. It is hardly necessary to mention that this excellent principle has long been availed of in opera-glass cameras and similar instruments, some of which, after the lapse of many years, are still popular.

A refinement of the double-camera system is that known as the twin lens, which is successfully applied to hand cameras. The ground glass of the upper or supplementary camera is replaced by a mirror inserted in the body of the camera at an inclination of 45°, and the image received upon it is reflected up to a sheet of ground glass let in the top of the camera, and shielded by a collapsible hood.

Of all view-finders this is undoubtedly the most satisfactory, for you see the image full size, clearly defined, and, as a rule, tolerably well illuminated, although in a bright light not even the presence of the protective hood can ensure as much brilliancy as could be desired. The drawbacks of the system are the increased size and dimensions of the camera, and the expense of the supplementary lens, a serious item if the working objective be of a modern type and it is thought desirable to duplicate it.

Reflecting Finders.

Twin-lens cameras, which give a reflected image for visual observation up to the moment of exposure, naturally suggest the possibility of obviating the employment of the second or supplementary lens, and of taking advantage of the reflector principle, pure and simple, in conjunction with the working lens, thus diminishing bulk, weight, and expense. There are, I think, several cameras extant constructed on this principle, of which I quote a short description in order to show how exceedingly simple it is to carry into practice. "A mirror, placed inside the camera at an angle of 45°, intercepts the rays from the lens, and serves the twofold purpose of preventing them from falling upon the sensitive plate at the back and of projecting them upwards on the focussing screen, which is fitted in the top of the camera, and upon which the operator watches the image, now in a non-reversed position. Touching a trigger at the fitting moment, the mirror, which is hinged upon a pivoted axis, flies upwards, covers the ground glass, and permits the light to fall on the sensitive plate, the lens being capped by an automatic movement or otherwise." This description applies to Sutton's reflecting camera, which was introduced in the year 1861, and modern makers of hand cameras embodying the reflector principle therefore have the satisfaction of learning that the undoubted excellence of this principle for giving a full-size view of the image at the moment of exposure—the ideal finder, in fact—was recognised tolerably early in photographic history, that is, thirty-six years ago.

Practicable, convenient, and simple though it undoubtedly is, the variety of forms the hand camera is capable of assuming and has to assume, and the exigencies of construction thereby involved, render the reflector principle impossible of universal adoption in the manner here outlined. Nevertheless, it is availed of, in some degree, in probably the greater number of hand cameras now made, the finders of which consist simply of small camera obscuras, in which, as you know, the principle of reflection also asserts itself.

The diagram shows the construction of the finder, A being a lens of simple form, B the mirror, and C the ground glass upon which the non-

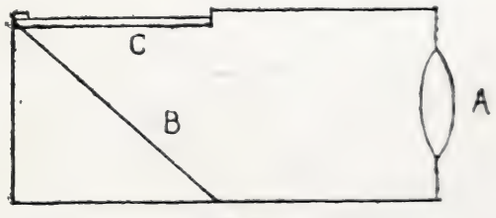


Fig. 2.

inverted image is received. It is usually sunk in the hand camera, and, when not so, is sometimes protected against extraneous light by a hood, so that a more brilliant picture is seen.

This form of finder has many faults and few virtues; practically speaking, it is only of comparatively little use. The lens is usually an uncorrected one of from one to two inches' focus, and therefore the image it transmits is ill defined, while, as regards included angle, the picture given by the finder lens is seldom coincident with the image transmitted by the lens of the camera to the sensitive plate, the loss of light by reflection is very great, and the centres of the two images do not coincide.

Supposing an achromatic lens were used, a diaphragm would obviously also be necessary, and thus the finder would still further cut off the light, so that, with improved definition, a corresponding disadvantage of loss of illumination would arise; nevertheless, this form of finder, as generally

used, notwithstanding its faults, would still be of service were a little trouble taken to adjust the focus of the lens in relation to the dimensions of the mirror and the ground glass, so that it embraced exactly the same angle of view as did the camera lens on the size of plate covered, thus assuring that both the reflected and the photographed images were coincident as regards included subject. This would be a great convenience to the hand-camera user, would be very little trouble to carry out, and is the one thing needed to make this form of finder in some degree effective. I think I am right in remarking that the adjustment of the foci I am here suggesting is not often made.

"Brilliant" Finders.

Greater luminosity of image than that yielded by the simple camera obscura, just described, has been obtained in a variety of ways, and is possessed by many commercial finders. The substitution of a total reflecting prism for the plane reflector, which obviates loss of light and throws the image on a brilliantly polished surface, instead of ground glass, is one of the best-known and oldest methods of increasing the luminous efficiency of the finder; and it will be obvious that, by making the front lens of greater area, more light is thereby got through; but, except in respect of increased illumination, these finders do not vary much, and at best, I submit, can only be regarded as so many compromises; they do not enable you to do what should be the function of a finder, that is, let you see at the moment of exposure an exact duplication of the scene you are photographing and facilitate your certain location of a moving or other object in the field of view on a particular part of the focal plane. This is entirely a function of focal length of lens in relation to the base line of the plate.

I might here mention that, by mounting on the front of the camera a double-convex lens of exactly the same focus as the camera lens, and placing the eye immediately over the focal plane, a simple form of finder is available, but a dark cloth or a fixed cardboard tube is necessary to exclude unnecessary light.

Telescopic Finders.

Telescopic focussing finders, for the photography of distant objects, have also engaged some attention. The late Mr. Traill Taylor employed a telescope affixed to the top of his camera for this purpose. The essential condition was that the focus of the object-glass of the telescope should be precisely the same as that of the camera lens. When the necessary adjustments were made, the telescope was attached by suitable means to the camera top, so that the racking in or out of the camera also operated the telescope. Manifestly this system was only applicable to long-focus work, for which, indeed, it was used.

About four years ago Mr. Dallmeyer worked out an interesting modification of the reflector principle in focussing finders. A mirror is placed outside the top of the camera parallel to the plane of the plate on which

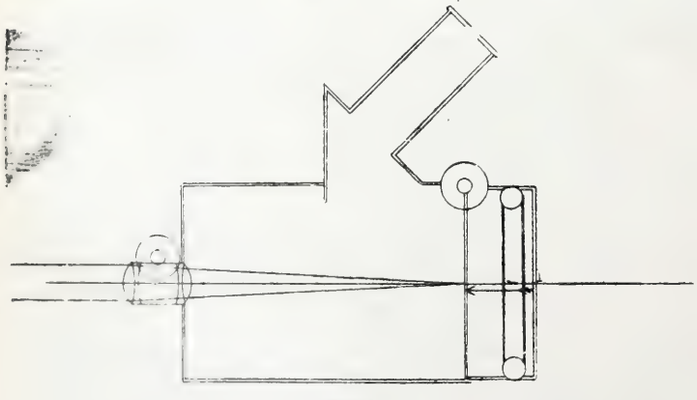


Fig. 3.

the image is received. At an angle of 45° to the mirror a removable tube is attached. On looking down the tube, the image is seen upon a whitened screen, which is actuated by a lever to remove it out of the way when it is desired to make the exposure by means of a blind shutter working behind this movable screen.

The telescopic focussing finder, which is fitted to the Naturalist's hand camera, an instrument designed for long-focus work, utilises the principle that "the photographic lens which forms the image on the screen is itself also the object-glass of a telescope, through which the object photographed is also seen." "A mirror is placed at an angle of 45° behind the back lens of the photographic objective. A second mirror, parallel to this, is placed on the top of the camera, and behind it is fixed a tube carrying a terrestrial eyepiece. Absolute registration of focus is made in the following manner:—The mirror behind the lens is temporarily removed, and some known object is focussed upon the screen. The mirror is then placed into position, and the terrestrial eyepiece is adjusted so that the same object is sharply defined. The terrestrial eye-

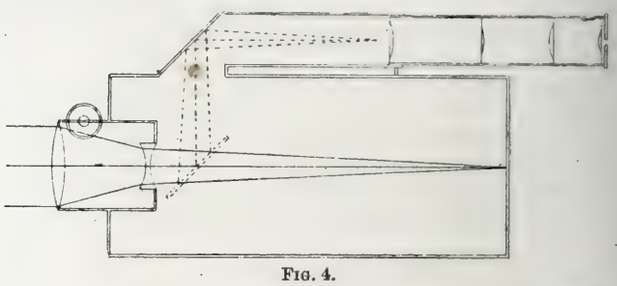


Fig. 4.

piece must then be fixed, and it will be found that, whatever object is in focus, made by the rack and pinion on the lens mount, seen through the telescope, will be in focus on the screen or sensitive plate."

The description of this interesting telescopic focussing finder is a quotation from a paper on tele-photography, read by Mr. Dallmeyer at the date named.

So far I have, I think, summarised the various forms of finders that have from time to time been suggested or employed, with sufficient fulness to enable you to judge of their comparative or particular advantages.

Experience and observation lead me to think that the position of the finder on the hand camera, that is in the front of the instrument, and virtually on the same plane as the lens, is not the best for enabling the photographer to examine the image, or to hold the camera in the most convenient manner, which I suggest is immediately in front of him and not under the arm. To persons with even good eyes it is difficult, with the camera held in front of them, to see the small-finder image, especially if it be unprotected by a hood, and this I take to be the reason why you so often notice the instrument worked from under the arm.

I raise this point for the opportunity it gives me of throwing out the suggestion that, if the image thrown by the finder were shown at the back of the camera above the focal plane instead of above the lens, greater convenience in its examination and in holding the instrument would be experienced by the photographer. And this leads me to the final suggestion, that the adoption of the tele-photographic principle in the formation of the finder image would not only enable the latter to be shown in the position mentioned, but, by imparting to the negative lens of the system the necessary adjustment for different distances, the hand camera which allowed the use of lenses of varying focal lengths would permit of the finder image for each lens coinciding with the image transmitted to the focal plane. Most hand cameras would, I think, permit of the slight modification of construction rendered necessary by the adoption of this suggested tele-photographic view-finder, which need not be more expensive to make than an ordinary "brilliant" finder. This, however, is only a suggestion that has occurred to me in passing, the practicability of which may be legitimate subject-matter for doubt or argument.

I am aware that I have by no means completely covered the ground suggested by the title of this paper, which, nevertheless, will have more than achieved its object if it raises a discussion and elicits the ideas of others on the subject.

Thomas Bedding.

THE CINEMATOGRAPH FOR ATTACHING TO THE LANTERN.

[Journal of the Camera Club.]

We have met this evening to consider an instrument whose action lies within one of the most deeply interesting branches of applied optics, for few optical phenomena have such a fascination as has persistence of vision; the eye can recognise its effect even without the aid of any special instrument, for the phenomenon is constantly exemplified in nature. Were it not for persistence of vision, the rain shower would be merely falling drops, not lines of water, the meteor in the skies would be bereft of its glory, being merely a fiery ball, leaving no glittering path behind it, and in man's imitation of a meteoric shower, a display of fireworks, the most elaborate catherine wheel ever designed would resolve itself into a few points of fire.

From time to time various optical instruments have been designed whose action has depended for their success upon this phenomenon, and most of them have been constructed with the object of conveying to the

a sense of motion, and adding a characteristic of animation to other- e uninteresting pictures. This class of instrument has been in stence for nearly a century; the earliest were crude, and, no doubt, fficient in their action, but the latest, which we submit to you this ning, will, I hope, demonstrate the really great strides which have n made in the art of again presenting to the eye movements, which have g since taken place, in all their life and vigour. That the reproduction these movements is now even possible we have to thank the knights of camera, whose intense interest in their work has caused the progress their art of making "sun pictures" to bear favourable comparison h that of any other branch of modern science, In this particular case only is the possibility accomplished, but the whole chain of operations, m the manufacture of the film and the recording of the movements to projecting of the "animated picture" upon the screen, is entirely hin the realm presided over by the photographer, and, in place of the ppet-like appearance of the figures in the early instruments, tantaneous photography supplies faithful representations of the ferent objects in motion. As these photographs spring into life we get thfully reproduced the bustle of a railway station, the execution of a llet on the stage, or the breaking of a tempestuous sea on a rocky ore.

Persistence of Vision.

Before we enter into details of any of the various instruments, let us a moment see what the "persistence of vision" is which controls the tion of them all.

As is well known, if an image falls upon the retina of the eye, the age appears to remain there for an appreciable time, and the eye some- nes perceives an image after the object which produced it has passed m the line of sight; this property of our visual organs has been termed persistence of vision." The "persistence" evidently takes place in the tic nerve, and, describing it to an electrician, I might speak of it as self-induction of the optic nerve." We find several analogies to this in ctrical matters; for instance, the "persistence" of the arc in an dinary arc lamp is just the property which enables it to be run on an ternating current circuit, for the reason that in a direct current system e arc appears to exist for a short time after the current has been cut f, thus when run on an alternating system the arc is maintained during e period of reversal; should the period of alternation become longer an the persistence of the arc, the light fails. However, the whole ing is summed up in this, that when an image momentarily falls upon ie retina of the eye, under ordinary conditions, it gradually fades away, id an appreciable time elapses before it entirely disappears.

Professor Muybridge, of whom I hope to speak later on, showed that, wing to this faculty of retention by the eye when viewing objects in otion, the eye was liable to be deceived by the picture of the object in ie position falling upon the retina before the picture of the same object another position had faded from view, and hence the unnatural position ven to horses or other animals in motion by some artists. The pro- uction of faithful pictures of animals in motion is a triumph of photo- aphy.

There is another point that I should like to mention in connexion with ie working of our eyes, and that is, that a period of darkness is ppreciated by them to a very much less extent than is a corresponding riod of light.

And, now, how are the results we are aiming at produced? First, in ie preparation of our pictures, all that is necessary is to secure, either by awing or by photography, a series of pictures of a given subject, picting the moving objects in the positions they occupy at short and gular intervals, the smoother the action is to be when reproduced the orter the interval or the greater the number of pictures per given time, e maximum number of pictures needed in a given time being determined the design of the instrument by which they are to be viewed. The parent animation is now synthetically produced by a blending together these pictures, and it can be done by any apparatus which will give a ep-by-step motion to the series, whereby they are exposed to the eye in gular rotation, the step from one to another taking place during a period darkness, or with other means provided whereby the movement is con- aled from the eye.

The result is that picture No. 1 is retained by the eye until the eye ceives No. 2, and No. 2 until the eye perceives No. 3, and so on, the eed of reproduction equalling as near as possible the speed at which y were recorded, the whole producing apparent continuity of motion.

It is interesting to trace the development of the present machine, and note how it has been elaborated by successive inventions in the photo- aphic world being seized upon to assist in that development.

Early Instruments.

The first instruments possessed hand-drawn designs, and these were ways of a more or less simple character, and depicted a sort of cycle of ents, which seemed to possess no beginning or ending; there was the n running with an umbrella through a shower of pitchforks, the wind- ll with its revolving sails, the boy receiving correction at the hands of maternal parent, the man running with a wheelbarrow, and so on. ere was a characteristic about these *drawn* pictures which I am glad say has disappeared from the pictures of to-day, It was this, that, erever animal motion was depicted, this motion was rendered with un- natural smoothness; for instance, in a horse taking a jump there was absolutely nothing to show that it was any effort whatever on the part of the horse to clear barriers of a prodigious height, and a strong man or gymnast went through his evolutions without the wrinkling of a muscle, and appeared to handle enormous weights as if they were feathers. In fact, everything which moved did so with a grace of action as if it or they were constructed like the theoretical pendulum, which possesses no weight or dimension except length. As far as I have been able to discover, the first instrument displaying animated pictures was the "Thaumatrope," said to have been produced about the beginning of this century. Then came the "Phenakistoscope," by some one named Platteau, who is said to have been a blind man. Then came the familiar "Zoetrope," and an "Alethorama," said to have been exhibited in London about 1845. About 1869 or 1870 came the "Praxinoscope," by Raynaud, an instrument which was of the same style as the "Zoetrope," only the pictures are seen reflected in revolving mirrors. At this time we also hear of a "Photoscope" by Mr. Talbot, in which microscopic views on glass were viewed through a lens as transparencies, and as they rapidly succeeded each other the effect of animation was produced; this appears to be the first instrument of the kind to take advantage of photography. Then we hear of a "Kinesigraph," by Mr. Donisthorpe, in 1887. Prof. Muybridge's photographs of galloping horses were first privately circulated about 1879 or 1880, and he then speaks of them as the result of years of experiment. In 1889 we find another specification by Mr. Donisthorpe. In the same year we get the work of Mr. Birt Acres and Mr. Friese-Greene's specification, issued from the Patent Office, with various comments upon it in optical and other papers. In 1893, we find exhibited in London the "Electrical Wonder," by Anschütz, of Germany, in which many of Professor Muybridge's pictures were used. The next year, 1894, bring us Edison's "Kinetiscope," which literally booms for a time, but falls altogether into the background at the advent of Lumière's "Cinematograph," the latest adaptation of which is the form it takes in the apparatus now under discussion.

The Zoetrope.

With your permission, I will select a few typical instruments from this list, and shortly describe them.

First, that with hand drawn pictures, the "Zoetrope," or "wheel of life." This consisted of a cylinder of cardboard, or perhaps metal, closed at one end and mounted on a vertical spindle, with its open end uppermost; the outside was painted black, and immediately below the top edge were cut a number of vertical slots. Inside, and resting upon the floor of the cylinder, was placed the band of pictures; these generally represented, as before stated, a cycle of events of a simple character, the whole cycle being represented by pictures of the same number as there were slots in the cylinder. A strip of these being placed in position, the cylinder was rotated, and, on looking through the slots, the various stages of the movement were blended by the change from one individual picture to another, each step taking place whilst the portion of the cylinder between the slots was between the eye of the observer and the pictures. The length of the cycle of events was limited by the circumference of the cylinder and other mechanical difficulties, but the whole thing gave endless amusement and no little instruction. May I say a few words about a device which is, no doubt, familiar yet to a good number of schoolboys? I remember we used to draw windmills upon the margins of the pages of our books, and, as the pages were held down by the thumb and allowed to escape rather rapidly, the sails of the windmill seemed to spin round in a pleasing manner. In this simple device we found that, the more steps the sails took in making a quarter of a revolution, the smoother and more natural was the effect. The scientific principle controlling the action of this device may have been of interest, but, as we found that the newest books and those with the stiffest pages best suited our purpose, the consequences were such that the development of the industry was prevented.

Muybridge's Results.

Now a few words on the work of Professor Muybridge, who was the first to successfully use photography in the art of recording animation. The method by which Professor Muybridge's pictures were taken was as follows: A track was provided down which the animal in motion, say a horse, was made to move; at one side of this track was a long building, containing a series of cameras twenty-four in number, with lenses all of exactly the same power; these were arranged one foot apart, and were focussed upon the spot where the horse would pass. As a background, and at the other side of the track, was a screen of muslin with vertical lines of the same distance apart as the cameras, and numbered consecutively. The shutters on the lenses were set in the usual way, and by doing so a strong spring was compressed on each; this spring was such that an exposure of about one five-thousandth part of a second was secured. To prevent vibration of the cameras, the exposures were made by the shutters being released electrically, the current being in its turn controlled by the breaking of a thread stretched from each camera across the track at about the height of the horse's breast, and so arranged that it would be broken when the horse was upon the spot upon which the camera was focussed; hence each camera would record his exact position at the moment of his flight past its lens, the whole series of pictures representing the consecutive positions occupied in passing over the twenty-four feet range of the instrument.

Here we see that twenty-four pictures only were taken of the object in motion, and each picture in a separate camera and from a different point of view. When these came to be combined, and projected by a lantern, the effect was rather curious, for, although there was motion of the horse or other animal, the horse galloped, but never got off the screen, as the background and other really stationary points in the picture appeared to flit past the view of the observer, and the small number of pictures, in order to make the display last a reasonable period, were made to recur several times.

Prof. Muybridge showed the results of his work to many an English and Continental audience, and wherever he went met with an enthusiastic reception, and, no doubt, inspired by these results, we soon find other workers in the field, amongst them Anschütz of Germany, who produced his Electrical Wonder. This was in the shape of a coin-in-the-slot device. The various subjects were mounted upon a flat disc, which was rotated upon a horizontal spindle so as to bring each picture successively opposite an aperture, through which they were viewed. Immediately behind the disc, and in a line with the aperture, was a vacuum or Geissler tube, which, by an electrical contact, was illuminated just as each picture was in position; the effect was not very startling, but some subjects lent themselves to this manner of being viewed better than others.

Edison's Kinetiscope.

The advent of rapid dry plates enabled Prof. Muybridge to secure good results, but the next step was rendered possible only by the introduction of the flexible film by the Blair Camera Co. This was made use of by Edison in his kinetiscope. The pictures were now reduced in size and more were recorded in a given time, the negative becoming a *strip* of pictures fifty feet in length.

I need not trouble you with a *résumé* of the stages through which Edison's experiments went; they were set forth in several magazines a few years ago, and, if any one would care to read it, they will find an article in the *Century Magazine* for June, 1894. The instrument, I think, we are all familiar with, with its peculiar cabinet-shaped case and funnel into which to look.

The two ends of the fifty feet of pictures were joined together so that the strip became an endless band; this was run over rollers up and down so as to use up the length and get it into the cabinet. Just under the funnel into which we look the "film," as it was at once called, assumed a horizontal position, and was illuminated by an electric lamp, so that it was viewed as a transparency through a magnifying glass. The film was fed forward at a uniform pace by an electric motor, and between it and the lamp was a disc revolving on a vertical spindle and having a section cut from it. The whole was so adjusted that the revolution of the disc synchronised with the position of the picture. Each time a picture was exactly in position to be viewed, the light passed through the disc and illuminated it, and during the succeeding period of darkness the film moved forward to the extent of one picture. The speed of this disc, and hence the number of pictures exposed, is about 2700 per minute. In experimenting, Edison determined the size of the picture most convenient to handle, and adopted as a standard a film of $1\frac{3}{8}$ inch in width, with the picture itself 1 inch wide and $\frac{3}{4}$ inch in height. The rest of the width of the film was needed for perforations, by which it was fed forward and its position positively determined; these were $\frac{3}{32}$ inch square, and there were four on each side of each picture.

These dimensions, I may say, have been adopted by other makers, and now form a standard. If the pictures are increased in size, the difficulties of working are increased tremendously.

The only differences between the kinetiscope and the cinematograph would be those necessary for the altered conditions under which the films are used if the kinetiscope possessed mechanism for securing a distinct pause as each picture came under view; but, since this is present in the cinematograph and not in the kinetiscope, the films do not behave equally well if exchanged from one to the other, and a kinetiscope film placed in a cinematograph cannot readily be run fast enough for proper projection, there being so many pictures per second that the movements are so slowly performed as to be painful to observe. The result is summed up in this, that a kinetiscope mechanism needs more pictures per second (there being forty-six) than the cinematograph, which has twenty.

Principles of the Cinematograph.

In the cinematograph the films are no longer a closed circle, but are wound upon a spool and fed vertically from the top past the point upon which the light is focussed as it comes through the condenser. In the kinetiscope the film ran its whole length without stopping, in the cinematograph there is a distinct pause of $\frac{1}{40}$ of a second when each picture is in position, and there are twenty pictures per second. The remainder of the time to complete the $\frac{1}{20}$, viz., $\frac{1}{40}$ of a second, is the period of darkness during which the film moves onward to the extent of one picture, or $\frac{3}{4}$ of an inch.

In designing these instruments, the difficulty is to impart motion to the film and bring it from a position of absolute rest to the speed of 30 inches per second, leaving it again at rest after moving only $\frac{3}{4}$ of an inch.

The film is a very fragile part of the apparatus, and the tug or pull is imparted to it by studs engaging in the perforations on each side of the picture. Should the edges of these perforations become worn or torn, the proper position of the picture relatively to the studs which hold it is not maintained, and we get the flickering or staggering effect so objectionable to most people. The refinement in the design of this part of the machine lies in the gentle and exact handling of the film by mechanical means. As regards noise in working, this is due to the fact that the parts in rapid motion strike upon parts absolutely at rest, and it is the force of this impact that creates the noise. The way to reduce this objection is, of course, to reduce the mass of the parts requiring intermittent motion, so as to do away with as much inertia as possible, and, if need be, add buffers where the blow falls.

The Lantern and the Cinematograph.

This is in general. Now allow me to say a few words about the form in which it can be applied to an ordinary optical lantern in particular, that is, the instrument now under discussion. I wish I had a slide of the instrument prepared, as from it you would see that one front tube has been removed, and the cinematograph device slid into guides upon the lantern baseboard; the reason for placing it thus is to secure as firm a foundation as possible. The whole is adjusted axially true in manufacture, so that the operator has only to centre his light in the usual manner. This can be done without the usual trials on the screen, as the stage being open, one can see that the picture is evenly illuminated.

The rolled-up film is placed upon the upper spool-holder, in such a manner that the pictures pass through guides provided for causing them to be perfectly flat and vertical where they cross the axial line of the optical system, and, of course, where they rest during projection. From this point they pass round a third of the circumference of a brass cylinder, which has studs projecting in such a manner as to engage exactly in the perforations along their edges; it is this cylinder which imparts motion to the films. They then pass on to the bottom spool, upon which they are wound. The use of this second spool materially decreases the liability of the film to be damaged, as it is at all times kept perfectly flat, and has no more than 12 inches or so unwound at any given time. Between the condenser and the film are two important parts of the apparatus; first, the alum bath necessary to absorb the heat rays from the light, and a revolving shutter which secures the period of darkness, during which the film moves forward. The spindle of this shutter projects beyond the side framework and carries a pulley; this pulley is driven by a belt from a hand wheel, and runs onward in a continuous motion. Geared to this spindle is a wheel, which converts the onward motion into a reciprocating motion, which is imparted to a lever which has a pawl engaging with the large teeth of a ratchet upon the axis of the studded cylinder. Thus the revolutions of the shutter and the intermittent rotary motion of the cylinder are perfectly synchronised, and are such that, when the shadow of the shutter is upon the film, the reciprocating motion is imparting a step forward to the film, and, when again the light passes the shutter, the cylinder with the film is absolutely locked at rest, whilst the reciprocating motion is taking the pawl back so as to again engage in the ratchet. At present the periods of light and darkness are equal, but the machines under construction will, it is hoped, give a period of light equal to twice that of darkness.

Owing to the design of this reciprocating motion the movement is imparted to the film comparatively slowly when first the step begins. It reaches its maximum speed when half the step has taken place, and then drops gradually to perfect rest just immediately before the light falls upon it; the result of this is very important, as it leads to the comparatively long life the films possess when shown in this apparatus. Some I have known to be passed through the machine 500 times and show no signs of wear, and still possess absolute registration upon the screen.

In conclusion, a few words about the latest form this particular apparatus has taken. I refer to an attachment for an ordinary optical lantern which can be used for either taking the negatives or projecting the printed films. In appearance it is exactly like the instrument now before us, and only needs to have an unexposed film placed on the spool, to be slid into its case, and the exposure secured by turning the handle; the film is then developed and printed. With the device on the lantern the projection can take place.

The possibility of taking one's own pictures is an important matter, for reasons other than the great interest they would possess for the taker, as the want of steadiness, or that staggering flickering defect in projection, is largely due to the manner in which the negative is taken. So far, most of the films come from France, and we have had to depend upon others for our pictures, and too often this defect is in *the pictures*, and no machine designing will eliminate it, but, with the usual care given by an amateur photographer in his exposures, negatives without this defect would be produced.

F. C. B. Cole.

Mr. A. Wrench, at the conclusion of the paper, demonstrated his apparatus, and exhibited an extended series of pictures. For the earlier portion of the demonstration, limelight, worked by Mr. Locke, was employed as an illuminant; but, in order to show the difference in the effect produced, the electric arc light, worked by Mr. Hepworth, was afterwards substituted.

Discussion.

Mr. J. E. Austin asked whether the effect would not be much more satisfactory if the apparatus were used for exhibition in a room of a private house, the size of the disc illuminated being necessarily much

naller than on the present occasion. He remarked that many of the ctures shown were marred to some extent by a number of vertical ack lines, and asked what was the cause of these markings; were ıey on the original negative, or did they appear only on the film upon hich the lantern transparencies were made? He also inquired the ıuse of the white flashes which were seen from time to time, as ıough portions of the film had been torn off. He understood that the lms used for the demonstration were new ones, and, if this were the ıse, the imperfections to which he referred were probably in the riginal negative.

Mr. Cole said that in a private house a more satisfactory result would e produced, as the flickering or staggering effect would be less apparent, wing to the magnification of the image being less than was necessary in large room. The white flashes might be due to either of two causes, iz., the flaking off of pieces of emulsion from indifferently manufactured lm leaving the film transparent, or in consequence of the omission to se an alum bath for the purpose of absorbing the heat rays, in which vent blisters would form on the celluloid film, and, when the tops of he blisters cracked off, the film would be laid bare, as in the previous ase. The vertical black lines were due to scratches on the transparencies, vhich were not new, as had been suggested, but had been selected for xhibition because they represented interesting subjects. When the film vas in the lantern, the sides of the scratches had a different refractive ›ower to the other parts of the film, and hence a black line appeared on he screen.

A member asked whether it was actually necessary that there should ›e a stoppage between each picture? In the old "wheel of life" the trips of pictures went round continuously, and the movement was airly consecutive. The chief difficulty in the construction of the modern ›pparatus appeared to be connected with the arrangement for the period ›f rest, and he suggested that it would be interesting to pursue experiments with a view to the use of the films without stoppages.

Mr. Smith asked whether, in taking the original negatives, the exposure was timed by some mechanical contrivance, such as a motor, or ›y turning a wheel by hand? It appeared to him that, to attain perection, the rate of interruption in the projection should be exactly the ıame as that at which the negative was taken. He had worked with Professor Vernon Boys in the photography of flying bullets, producing :esults somewhat similar to those shown by Mr. Wrench, though of a very feeble description, and had found that the point to be aimed at was that the rate of reproduction should be isochronous—if he might use ihe term—with that of exposure.

Mr. Cole, replying to the question as to the necessity for intermittent motion of the film, said an instrument had been devised for projecting :he image without a period of darkness; but, owing to the fact that the eye saw the motion, a sort of rainy appearance resulted, streaks of light passing down from top to bottom of the film throughout the time it was being used, and the apparatus was therefore unsatisfactory. In the kinetiscope the film moved onward regularly, without stoppage; but in that a disc was used with a slot cutting it, the light passing through the slot, and there was consequently very little light. For projection on to a screen there must be a powerful light, and hence the necessity for the stoppage, for, if the shutter were done away with, the rainy appearance would be caused. The photographs were taken by means of a device turned by hand, and it was surprising to find how regularly it could be actuated after a little practice. For theoretical perfection the use of some sort of governor, or electro-motor, would be preferable; but, practically, hand power was quite sufficient for the purpose.

A member said the photographs shown had apparently been taken with short-focus lenses, and he suggested that lenses of longer focus would yield better results.

Mr. Cole said that he did not think the use of these instruments had yet gone far enough to determine what the effect would be if long-focus lenses were employed; the photographs exhibited were taken with lenses of 1½ inch focus.

Mr. A. A. Campbell Swinton thought a very much more simple method might be devised for showing the pictures. As far as he understood, it was necessary that a very brilliant light should be passed through the film at certain regulated intervals. It was a very old experiment to place a newspaper on a rapidly revolving wheel, and to illuminate it by means of electrical discharges from Leyden jars, when it was possible to take a photograph of the wheel in which every letter of the newspaper should be perfectly distinct. It occurred to him that, if in the place of the ordinary electric lantern a pair of knobs were employed, with a very large battery of Leyden jars discharged at stated intervals between the knobs, a continuously running line of film might be used, and the light given by each discharge would last such a very short space of time—only a few millionths of a second—that practically the film would not have moved any appreciable distance during the discharge. At the same time, with a sufficiently large battery of Leyden jars, there would be an intensely brilliant light, the candle power being as high while it lasted as that of any electric lantern. He thought that, by means of a device whereby the jars could be discharged just at the right moment, it would be possible to arrange an apparatus which would show the photographs in a much more perfect manner than had hitherto been achieved.

Mr. Cole, in replying to Mr. Swinton's remarks, gave a partial description of Anschütz's Electrical Wonder. That instrument, he said, consisted of a disc revolving upon a horizontal spindle in a darkened chamber, the pictures being placed near the circumference of the disc. Projecting from the edges of the disc were little pins or studs, and, when the picture was opposite the aperture through which it was viewed, one of the pins made an electrical contact, and a discharge was secured through a vacuum tube, the period during which the discharge illuminated the picture being so very small that, relatively, the disc made no advance whatever. It was found, however, that the light was not sufficient to render the pictures distinct, and the Electrical Wonder was, therefore, not a success. A good many attempts had been made to convert it into a projecting apparatus, but they had all ended in failure.

Mr. Campbell Swinton said his suggestion was to substitute a Leyden jar discharge between poles in air in place of the vacuum tube, which gave a very mild form of light, and he thought the idea could be worked out to give exceedingly effective results.

Mr. Cole said Mr. Wrench informed him that many attempts had been made to project pictures on the screen without the step-by-step motion, but all had failed. Experiments had also been made in the projection of the actual kinetiscope pictures by means of prisms, but they had all been unsuccessful, simply because the film did not come to a dead standstill.

The Chairman said he thought that the most satisfactory device would be one in which the film should have a continuous uniform motion, and that there should be appliances—such as rocking prisms or mirrors—which would, by oscillation, cause an apparent standstill of each picture on the screen, and bring about a similar effect to that which had been shown to-night. He had not, however, come across any one who had made a complete machine on that principle, although he knew one inventor who had attempted to do so, but had given it up in consequence of the great difficulties which he encountered. He thought the thing was possible, but did not know that it would ensure better registration of the pictures than did the present apparatus.

A FLASHLIGHT MIXTURE.

My favourite flash compound is composed of one-third finely powdered permanganate of potash and two-thirds magnesium filings. The permanganate should be powdered in a mortar, and then mixed intimately with the magnesium on a blotter with the fingers. No chance of a spark should be taken, by mixing with a steel implement or in a mortar. I don't recommend it as the safest compound known, yet, with proper precaution, no accidents need happen. I have used it for about twelve years without accident, says the editor of the *Photo-American*, and during that time have mixed and exploded many pounds of it. The light is a very brilliant violet, and it gives a flash of extremely short duration. For dark interiors, where ample exposure was necessary, I have used it laid in a long train with excellent effect.

When the photographer desires to be included in a flashlight group or interior, unless quite elaborate apparatus is used for effecting the discharge, one generally has to hurry so after lighting the fuse that scant time is allowed to get in position and appear as composed as the rest of the group. The following "wrinkle" may be of service to those who have heretofore lit the fuse and made a wild dash for position, getting caught by the flash half the time probably before they were fit for publication, as it were.

Pour the flash compound where desired, and next to it a little pile, say, ten grains, of permanganate of potash powdered. Draw the slide, remove the cap, and, before seating yourself in the desired position, add a drop or two of concentrated glycerine to the permanganate. According to the quality and fineness of the permanganate, ignition will occur in a greater or less number of seconds. Of course, when the permanganate takes fire, it will explode the flash compound next to it. Coarsely powdered permanganate will not be fired by glycerine as soon as fine. By trying several grades by the watch, one may select the grade desired.

HUGHES'S IMPROVEMENTS IN PROJECTION LANTERNS.

In the drawings illustrating Mr. W. C. Hughes's improvements, fig. 1 is a perspective view of the reservoir of an ordinary three-wick lamp adapted to receive and hold a frame, fig. 2.

Fig. 2 is a perspective view of a porcelain or metallic frame adapted to fit upon the reservoir, fig. 1, after the manner shown by fig. 3, which is an end elevation of figs. 1 and 2 combined.

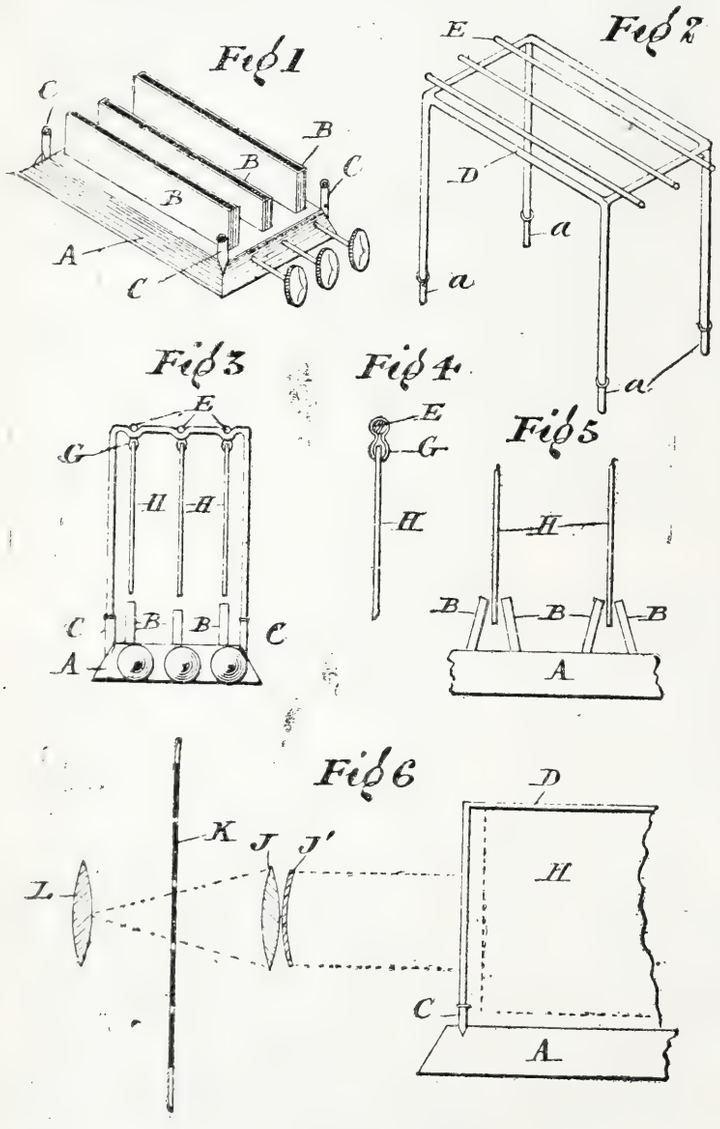
Fig. 4 is an enlarged detail hereinafter explained.

Fig. 5 is a diagram illustrating an alternative arrangement of the wick tubes.

Fig. 6 is a view illustrating the combination constituting the invention and its application in connection with the film of a cinematoscope.

For the purposes of my invention, says Mr. Hughes, I provide a lamp, the reservoir of which, A (fig. 1), may have one or more wick tubes, B (preferably three as shown), arranged parallel with each other, the said reservoir being provided with suitable means—such, for instance, as sockets, C—for receiving the legs, *a*, of a preferably rectangular frame, D

(fig. 2), substantially as at fig. 3, constructed of porcelain or any suitable metal capable of withstanding the heat to which it may be exposed. Upon the upper surface of the said frame I place the same number of porcelain or suitable metallic rods, E, as there are wick-tubes, B, one over each, and, in order to retain the said rods in this position, I may find it convenient to form, in the ends of the said frame upon which these rest, a like number of undulations, so that the said rods may rest in these, as at fig. 3. Each of the said rods may be provided with one long, or any



desired number of short, but suitable, spring clips, such as G, adapted to hold a curtain, fringe, or plate, H, of any material capable of being rendered incandescent by the application of heat, as shown by fig. 3, and more graphically by the enlarged diagram, fig. 4, the said curtains or the like being so suspended upon the rods, E, as to depend immediately over, and of such a length as to reach nearly to the wick tubes, B, so that the flames from the wicks may impinge directly thereon. Or I may arrange the said wick tubes in pairs, and at such an angle that each pair lean towards each other, a sufficient space being left between them to receive the incandescent curtains or the like, H, as at fig. 5, which provides that the flames from the wicks in the said tubes would impinge upon each side of the said curtains or the like.

The said lamp would be placed in such a position within the lantern that the said wick tubes and the incandescent curtains or the like would be presented endwise to the condenser of the lantern, a suitable reflector or reflectors being provided, by the means of which the back light would be reflected between the said curtains, or the like, to and upon the condenser.

A portion of my said improvements consists in the use of a condenser of unusually small diameter, that is to say, from one to two, or two and a half inches, and preferably consisting of a double convex lens, J, and a meniscus, J^1, placed in the order and position shown by fig. 6, so that the light may be concentrated directly upon the centre of the picture to be projected; and, assuming that my invention is employed in connexion with a cinematoscope, in which the pictures to be projected are very small photographs upon a travelling, ribbon-like film, K, I am enabled by the combined means of my said incandescent lamp and condenser, to concentrate the intensely bright light directly upon the said small pictures while at rest, and reflect these upon the lens, L, from which they would be projected on to the screen in the usual way.

Correspondence.

ACETYLENE.

To the EDITORS.

GENTLEMEN,—I note that in your issue of March 5 there appears a paragraph commencing "Exit acetylene—as far as Lanternists are concerned." Will you allow me to suggest that the writer is somewhat in error, or, at least, previous.

Those lanternists who have used acetylene, and appreciated the immense advantage of a really good illuminant that does not require attention when once set going, will not readily give it up. Those who really know something about the gas, and have a good apparatus, are not afraid to use it in any building, provided, of course, that they are allowed to do so, especially as not a *single authenticated case* of the explosion of an English pattern generator has been reported; in fact, the *only* case of *explosion* that I have heard of *in England* was caused by using a *naked light* when recharging a generator *kept in a cellar*. But, even if lanternists are not allowed to take their acetylene generator into the building, they need not give up acetylene altogether, when a few feet of indiarubber tube will convey the gas from *outside*. The present regulations of the insurance companies can thus be met with but little trouble, so that lanternists need not yet read the burial service over the best and most easily managed illuminant that has yet been invented for provincial and country amateurs' use. I do not, under any consideration, advocate the use of compressed acetylene, either indoors or out, as *all* the accidents (with but two exceptions) have occurred when using acetylene in this form; but with a reliable generator of fair pressure there is positively *no risk* whatever, except when using naked light when recharging or *discharging* gas-holder. I, therefore fancy that before very long the present rules will be so modified as to allow of the free use of such a handy illuminant.—I am, yours, &c.,

ACETYLENE.

PHOTOGRAPHIC SECTION (CROYDON MICROSCOPICAL AND NATURAL HISTORY SOCIETY).—On Friday the last Lantern Exhibition of the season was given in the School of Art Room at the Public Hall, Mr. Alfred Underhill being in charge of the Society's oxyhydrogen limelight lantern. In all, some 200 slides were projected on the screen, nearly all being greatly above the average, many coming in for a large share of applause. Among others may be mentioned a fine series of Croydon views by Mr. J. H. Baldock, F.C.S., taken on the occasion of the Royal visit to Croydon in May last, also views in Devonshire, Derby, Scarborough, and Brighton, four photographs of the sun by the same gentleman being greatly admired. Mr. Williamson showed a few choice Swiss scenes. Mr. E. G. Platts contributed a large number of excellent photographs of Wales, showing many picturesque mountain views and waterfalls, also some very beautiful floral studies, animals at the Zoo, and many miscellaneous subjects. Mr. Hode followed with a well-chosen series of the Norfolk Broads, many of the cloud effects being specially fine. Mr. Cart showed some excellent pictures of Horley and neighbourhood. The Exhibition concluded by a contribution from Mr. Underhill, consisting of photographs taken at Guildford, Dorking, and Ramsgate, also a few hand-camera snap-shots of cattle in Beddington Park, boats at Brighton, &c.

MANCHESTER PHOTOGRAPHIC SOCIETY.—On the occasion of the last Lantern Meeting of the present session, held on the 24th ult., the evening was devoted to an exhibition of members' slides, and nearly all present availed themselves of the opportunity of having their slides depicted on the screen. The first shown were by Mr. H. M. Whitefield, and were chiefly round and about the Norfolk Broads, including such interesting places as Norwich, with its quaint streets and fine Cathedral, and Yarmouth. Mr. W. G. Coote was represented by views of Fountains Abbey, and scenes in Shakespeare's country. Mr. W. Tomlinson showed several good figure studies, and also an effective sunset. Mr. T. Chilton had a number which, although not taken recently, were none the less interesting. Mr. F. W. Burton's were chiefly Scotch, although a view of *Worsley Boat-house* was very good. Mr. Harry Wade had many slides, the negatives from which they were made being taken on the Society's rambles. Mr. J. Wolfenden (Lanternist) had a large number of different parts of the country, including Matlock, Alton Towers, Ingleton, Tintern Abbey, and Worcester Cathedral. Mr. F. Edwards showed a fine set of architectural views in Normandy, and Mr. F. W. Andrew also, with views in almost the same district. Mr. J. W. Wade, one of the honorary members, brought with him several of his latest cloud and seascape effects, which closed a most interesting and instructive evening.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*May* 7, 1897.

THE LANTERN RECORD.

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LANTERN MEMS.

It almost takes one's breath away to think of the sums realised by a magic lantern. Some time ago I heard that 200,000*l.* had been made in two months by the sale of certain rights or concessions with respect to the cinematograph, and now we have the Paul's Animatograph Company floated with a capital of 60,000*l.*; not only so, but, if I am correctly informed, subscribed for three times over. Many persons acquainted with such undertakings expressed doubt as to this amount being forthcoming, but, personally, I felt sure, and stated that it would be subscribed. Why did I not have the courage of my opinions, and invest, so as to "make a bit," when the stock is quoted at a premium?

* * * * *

The prospectus offered a most tempting bait to investors, for 1200 per cent. profit does not often fall to the lot of business men and inventors, and when a plain statement of fact is published, even allowing for the first tide of success making the returns phenomenal, there was sufficient behind for the majority of those "making haste to get rich" to plank down the deposit money in the hope of getting shares allotted. Whether the competition of other "graphs" will affect the result after a while, time only will show. Any way, Mr. Paul is be congratulated on his business shrewdness in so successfully turning to account his improvements. How some of the forerunners of apparatus for showing animated photographs would like to have reaped a moiety of such a sum as 40,000*l.* for their labours.

* * * * *

Such is life and *luck*. One man spends seven years designing, constructing, and endeavouring to perfect an apparatus, and something almost uncontrollable prevents him making it, according to his idea, perfect, when another comes along and 'strikes oil.' I am not for a minute desirous of withholding just credit for improvements, but only wish to emphasise the fact, that very often the real and original inventor of the principle or of the pioneer apparatus fails to get what, morally, is his just reward. No doubt, the Patent Office specifications are being carefully noted by numbers of agents in the interests of foreigners, and by men in England with a "mechanical bump" to take advantage of anything that may be good in patents that are allowed to lapse, but in inventions, as in life, "the race is to the swift," and he who can by a novel combination or improvement first make a machine that produces results of a satisfactory nature, and at the same time is successful in finding a market for it, is entitled to what he gets.

I hear that another matter, in which all photographers are interested, has so far progressed that 100,000*l.* has been put down for it. I allude to Chassagne's process for colour photography. This is a large sum considering the debatable nature of the results and the opinion of experts as to the published specification. If the shade of Daguerre or Archer could see these figures, what would they think; and, as regards Messrs. Sayce and Bolton, if they had only protected their emulsion, and patented or "syndicated" it, whatever sum would have to be named for it, considering the amounts that are now quoted for "developments" of their work? I suppose the age is not sufficiently socialistic to give away any portion of a reward to those who freely gave to the public the particulars of processes *that helped* to make the later improvements possible, and without which there would have been no reward.

* * * * *

When only small sums of money are made, one cannot afford to be philosophically generous; but, when fabulously large sums like I have mentioned are obtained by, at times, something little more than an accident, I think, although no law can compel it, the moral obligation should prompt a generous treatment, and a money gift to the pioneer, if living, or some endowment of a fund for experimental work in the case of the real inventor of the principle involved being dead. People will say, Who shall say who is the real inventor? and I readily recognise the difficulty, for, in nine cases out of ten, the final improvement is due to several modifications or combinations that others have already worked at, but in the tenth case, where a man is known to be the pioneer, and really produced the first practical results of a principle, then I say, if fortune has not favoured him with this world's goods, those who benefit by his work should not forget him.

* * * * *

As an illustration of a real inventor I would name Professor Röntgen, for he first practically applied a principle, and obtained photographs by the X rays. I would also mention, in connexion with photographs portraying apparent motion by reason of rapid exposures, Professor Muybridge, who, by a series of cameras automatically exposed, was able to produce a remarkable set of animated photographs of animals, birds, and human beings in motion. Mr. Edison must also be adjudged an inventor in respect to the kinetoscope, for from this, if my particulars are in order, the whole of the "graph" tribe for projecting animated photographs spring.

* * * * *

One more paragraph on this subject and I am done; but I can't get out of my mind the six-figure amount, for I recently heard that another "graph" for producing animated photographs is to be floated as a company or syndicate to the tune of something like 150,000*l.* What a merry jingle, to be sure, and, if my friend Bennetto can only complete his arrangements and place his colour process on the market, we shall have to celebrate a record year in photography and lanternia as well as the Queen's record reign.

I AM afraid the ladies, at a recent meeting of a scientific society, had a difficulty in keeping themselves apparently interested in the subject of cathode rays, for, able as the lecture was, it could hardly be considered popular, and I suppose, outside the Council and the select ring of *savants*, there were very few that could follow the learned Professor with his formulæ. The theatre was packed with a distinguished audience, but "more fireworks" were evidently wanted, as a gentleman near me was nodding and one or two well-known men in the scientific world were yawning. This type of lecture enhances the reputation of the lecturer as a scientific man, but would hardly ensure a popular audience the next time it was announced, being, in my opinion, suited more for a technical meeting, and I mention it simply as a type, with the view of emphasising the importance of lecturers making their experiments and explanations suited to their audience understandings.

* * * *

PERHAPS I was somewhat disappointed at this particular lecture, because I hoped to see a further development of the X-ray results, having been trying my hand a little lately at this. Radiography is most fascinating, and has, no doubt, "come to stay." As our knowledge advances many things may be possible that are not apparently so now. It is curious enough, when using a four-inch spark coil, a focus vacuum tube, and a fluorescent screen, to see through each other's bodies, and be able to count the ribs and see the shape of the spine, besides seeing all the bones in the arm, wrist, and the foot (through the boot), &c.; but, when our knowledge increases, so that we can, with a moderate-size apparatus, see the heart beating and lungs inflating, much more will be accomplished. The management of the vacuum tube is a great item in successful results, for, if worked with the current the wrong way, it temporarily loses its efficiency, which can only be restored by reversing the current and warming the lamp by a spirit flame.

G. R. BAKER.

A HINT TO ANIMATED LANTERNISTS.

MEANING, of course, those lanternists whose lot it is to operate the fearful and wonderful machines which are employed to produce the phenomenon known as the "living photographs." Many and varied are these instruments; almost as many, and almost as various as their multitudinous and generally terrible names. They are complicated in construction, many of them. They might even be described as being nearly as complex in their inward parts as is the derivation of their baptismal cognomens.

Owing to the peculiar exigencies of the optical arrangements of these machines, it is necessary that they should be used in conjunction with as powerful a source of light as is at the disposal of the operator. In many places it is not possible to beat the lime light as an illuminant, for all the apparatus necessary to its production can be carried about by those in charge of the dashographe. Did I hear somebody ask for the derivation of that word? Well it has none. It has already been pointed out that the names—not to mention epithets—that have been given to the various adaptations of the old kinetoscope to projection, are as the sands of the sea for multitude, and this is the only one among them which is not derived from a foreign language. I have another and more potent reason for using it, however, besides this one which may be ascribed to patriotism. You may have noticed, in fact I do not think that you can have helped noticing, that the peculiar combinations of sounds by which the several machines of this nature are known to their respective inventors, and to some few others whose linguistic attainments are equal to the strain, are not of a kind that the average individual is able to undertake the pronunciation of with impunity. It is merely, therefore, out of deference to the health of the readers and a sincere wish not to "break the machine" on which THE LANTERN RECORD is printed that the present course has been adopted; for you see, if the name of one particular machine—say the cinematographe—were mentioned, it would be necessary, out of common fairness to the others, that they should have a turn whenever the wish to avoid the crime of tautology suggests that a departure should be made from the last-used form of speech. The terrible result of such an article to the nervous system of any luckless Lantern-Recorders who might chance to get their teeth into it are easier imagined than described. Please understand, therefore, that, for the purposes of this note, the word "dashographe" signifies one or all of the curious mechanical constructions for the projection of living photographs upon the screen.

At the moment when you interrupted, I was calling attention to the fact that the optical arrangement of these instruments is necessarily such as to demand the brightest available source of artificial light. Lime light can be used, and constantly is, but the pictures, if of any considerable size, invariably suffer from poorness of illumination, for this form of light is not sufficiently brilliant for the purpose. The only really satisfactory light is that afforded by the electric arc; but, unfortunately, this is not always available. However, its great superiority over the only other illuminant that is anywhere "in the running"—the lime light—has brought it into considerable prominence lately, and since it has been reckoned as a *sine-quâ-non* by some of the exhibitors of animated photographs, electricity is now on tap at many of the halls where until then it was only visible to the longing eyes of the intinerant lanternists through the unconvertible medium of the little glow lamps.

Now, since the very beginning of animated pictorialography—I didn't coin that word, it is one of those I mentioned just now—the operator has been faced with a difficulty. It must not be supposed by the laity that that unenviable individual has only had to encounter *one* difficulty of large proportions; but there is one that is isolated from the rest because of its peculiar nature. It is this, Animated photographs do not last for ever. At a matter of fact, they come to a very abrupt termination at the end of about thirty-five seconds or a minute or even a little longer, according to the length of the film to which they owe their being. Then, before a new picture can be started, there is a necessary interval of one minute, two minutes, or longer still, depending upon the ease or otherwise with which that particular machine in use can be manipulated and the dexterity of the operator. The difficulty is, How shall that interval be filled up? It is always unwise to leave an audience, however good-natured, in total darkness while the animated lanternist more or less dexterously puts a new film in position over the teeth of his sprocket wheels and makes other necessary adjustments: operations, all of them, that do not come easy to the coolest individual; to him who is at all flurried they are awful. Then, again, it is almost equally unwise to turn up the lights in the hall between the pictures, though this method has the advantage of giving the operator light to work by, for there never was a dashographe yet that had any light to spare, and to dazzle the spectators' eyes with decent illumination between whiles cannot fail to be detrimental to the appearance of the pictures that follow. It may be suggested that to steer a middle course will meet the difficulty, and that half a light is better than none, and likewise better than plenty: that is because the suggester does not take into count the very delicate and sensitive compound organisation that is presented by a mass of people gathered together for the purpose of being amused. The result of putting them in partial darkness will invariably be to put them, as a whole, in a bad temper, and again the pictures suffer, for I tell you there is not an animated photograph in heaven and earth, either good or bad, but thinking makes it so. Study the comfort of your audience and please them in these little matters, and nine-tenths of them will go home and swear your pictures were good even when they were execrable.

That is not the tip, however. I am coming to that now. The alternative to leaving your audience in full light or complete darkness or partial obscurity in the intervals between the pictures is to give them something to play with. One well-known operator claims that the people who come to his shows keep quiet between the views out of very gratitude for the beauty of those they have already seen. The moment one picture comes to an end he throws upon the screen by means of another lantern the title of the next, so you see the gratitude in this case is a lively sense of favours to come.

Where limelight is the source of illumination employed, it is almost as easy to run two lanterns alternately as it is to run the dashographe alone. Indeed, one of the very best of these machines may be obtained fitted to a biunial lantern so that the audience may be kept amused by the exhibition of ordinary lantern pictures while the films in the animated part of the apparatus are being changed. But, as I have already pointed out, for the best results, limelight must give place to the electric arc, and here we are met with a difficulty in running two lanterns at once.

The quantity of electric current that an arc light suitable for the projection of living photographs will consume is such as to make the hair of the electrician at the hall to stand upon end. It is not so much that the actual cost of the electricity is big enough to be perturbing to even the most economical of hall-keepers, but the wires required to carry this current to the point of consumption must be of ample diameter, and it often puzzles the electrician to find a point in the wiring of the hall where so large a current may be tapped with impunity, except at some almost

inaccessible place to which the wires the lanternist brings with him will not reach. I know of many operators who coolly demand 25 ampères for their arc light, and such is the craze for living photographs, they very often get it. One gentleman of my acquaintance runs an arc consuming at least as much current as this, and more if he can get it, while in the intervals between his pictures he throws the titles on the screen by means of a lantern illuminated by an electric incandescent lamp, which brings the consumption up to nearly 30 ampères.

But, for all that, the result is not at all satisfactory. The arc light part of the show is all right, but, directly the other lantern is switched on, it throws a light which is terribly yellow by comparison with the other, and far inferior in point of luminosity, while it makes the arc light appear quite blue by contrast afterwards. However, two arc lights, taking 15 ampères each, is an order that the most obliging of local electricians may be pardoned for regarding as too large, and it is not altogether practicable to switch from one to another in the manner which would be necessary for success, especially if the two lights are not to be burning together for a moment, except—ay, there's the tip.

It was quite by accident that I found it out, and, as I have never seen it mentioned, I take the liberty of bringing it under the notice of RECORD readers, my excuse being that I think, and hope, it may be useful to them.

I was trying, for a special purpose I had in view, and which need not have further attention bestowed upon it now, to run two arc lights on one circuit. The circuit was one of 100 volts, and, as all lanternists know, only something under 50 volts is required in an arc lamp, the other 50 being wasted in the resistance that must be used to keep the current under proper control. It is a matter of general knowledge that two good automatic arc lamps can be run in series on a 100-volt circuit, and the amount of electricity which they together will consume is no more than is required for one similar lamp. But it is not practicable to treat hand-feed lamps—which are almost invariably used for lantern work—in this manner; so, in order to carry out my experiment, it was necessary to split the current into two branch circuits, putting a lamp and a resistance in each.

Now, unfortunately for my purpose, there was only one resistance at my disposal at this time; but, as this was capable of carrying 20 ampères, whereas, I only required 7 or 8 ampères in each lamp, I thought it would serve perfectly well. My lamps are fitted with a special "quick-striking" apparatus, which makes it possible to establish the arc just when it is required, and practically instantaneously. The resistance being of the variable description, I first of all started one lamp at a current of 8 ampères, meaning to increase the current when the time came to bring the other into play. This was accomplished by moving the sliding contact over four or five of the points, whereby the ampèrage was increased to between 18 and 19; but, when I attempted to strike the other arc, it was perfectly successful as far as it went, but the first one was extinguished simultaneously with the lighting up of the second. Then, with the quick striker, before alluded to, I re-established the light in the first lamp, the other going out at exactly the same moment.

This to-and-fro business went on with perfect regularity, and every time I lighted one lamp the other went out. It made no fuss about it. It quietly, but firmly, extinguished itself at the very moment that the other lighted up, and, though it seemed to act more in sorrow than in anger, so to speak, no amount of persuasion, on my part, would induce it to behave differently. This persuasion took the form, among others, of striking the two arcs simultaneously, or as nearly so as I possibly could, but all without avail. Only one lamp would light up; the one, I suppose, was a tiny interval behind the other, though that interval was quite undiscernible.

All this, of course, was very annoying to me, but out of evil springeth good, as the poet hath it, and I hope it may be so in this case. The animated lanternist who wishes to run two lanterns alternately, using in each case the maximum current that he can get, but never going beyond that maximum current, will find, in my misfortunes, a way out of his own difficulties. This is his mode of procedure: Let him branch one of the wires which bring the current to the place where his lanterns stand, and lead each branch to one terminal—say the positive—of each lamp. The other wire goes to one terminal of the resistance, from the other terminal of which a branched wire leads to the negative terminal of each lamp. Thus, only one resistance, of the capacity to work with one lamp, is used, and the two lamps are connected from it in parallel. It is important that there should be some form of quick-striking arrangement on the lamps, in order that the change over from one to the other may be made without any spluttering or unsteadiness of the light, but it is not essential.

Let us suppose that the exhibition commences with a title slide in the lantern properly so called. The lamp in this lantern is lighted up first, no notice being taken of the fact that the other lamp is in connexion with the electric supply—it will not light up until the carbons are brought together—and, when it is seen to be burning properly, the lights in the hall may be lowered or turned out. Then the dashographe part of the apparatus is got ready, and, when all is arranged to start, it is only necessary to touch the striking mechanism of the lamp in the lantern belonging to it, and begin turning the handle. Towards the end of the picture the lanternist should place his hand on the striker of the lantern lamp, an assistant having meanwhile changed the slide, and, when the living photograph comes to an end, a mere touch starts the lantern and extinguishes the light that is no longer required.

Whether this phenomenon is due to the sudden rush of current when the carbons are brought together in one lamp, robbing the other for the moment of the wherewithal to sustain its light, and so breaking the continuity of the arc which is unable to re-establish itself, or to some other cause, I must leave to an electrician to explain. Probably the effect is very well known to those who know anything of electricity, but the lanternist, I think, is not familiar with it, and, as I have endeavoured to point out to him, it may be very useful. CECIL M. HEPWORTH.

THE ART OF MOVING PHOTOGRAPHY.

FOR the following excellent article, and the accompanying illustrations, we are indebted to our esteemed contemporary, the *Scientific American*: The art of moving photography had its origin, or, to speak more strictly, its first suggestion, in that ingenious little toy known as the zoetrope, which enjoyed such great popularity some thirty or forty years ago. This, it will be remembered, consisted of a cardboard cylinder about a foot in diameter, which was rotated on a vertical axis, and containing a series of vertical slots cut in its periphery. A strip of paper, on which were printed a series of moving figures, each one in a different position from its predecessor, was coiled around the inside of the cylinder, just below the line of slots or peep holes, the distance between the figures being equal to the distance between the slots. As the cylinder was rotated, the figures appeared to be in motion. The illusion is explained by the fact that the eye is capable of receiving and recording only a given number of impressions in a given time, and, if the successive pictures are presented to the eye too fast for their individual apprehension, they will blend, as it were, and produce on the mind the impression of a single picture.

The zoetrope had its day, and ultimately passed out of favour; but its very crude and imperfect moving pictures were full of suggestiveness. The optical laws by which the results were obtained in course of time attracted the attention of experimentalists in the then youthful art of photography. About ten years ago the French scientist, Marey, while at work on a flying machine, obtained photographs of birds in motion by means of a number of cameras, whose shutters were operated by the wings of the birds as they flew across the room. The idea was then taken up and further developed by Dr. Muybridge, of Philadelphia. At an earlier day than this Mr. W. K. L. Dickson had been experimenting in the same field, and, as the result of the subsequent joint labours of himself and Mr. Edison, the famous Edison vitascope was produced. The Lumière Brothers, a firm of French photographers, brought out the cinematograph in 1894, and this was succeeded shortly afterward by the biograph, which last device, and the 'mutograph' and 'mutoscope,' are the inventions of Mr. Herman Casler, and form the subject of the present article.

The machine, with which the original pictures are taken, is shown in fig. 1. It is known as the 'mutograph,' nearly following the Latin and Greek words signifying 'changing delineation.' The camera frame is mounted by means of three adjustable legs upon a triangular turn-table, which may be placed upon any suitable support. Upon the top of the frame is bolted a two-horse-power electric motor, which is driven by a set of storage batteries, that will be noticed standing at the side of the machine. The combination of the turn-table with the vertical adjustment before mentioned enables the camera to be shifted so as to take in the required field. In the front end of the camera is fixed a particularly perfect lens, capable of gathering a great flood of light and producing an image of exceedingly clear detail. Above this lens, on the front face of the camera, is fixed a photographic "finder," which gives the same sized image as the main lens, and enables the operator to determine when the subject is properly focussed. Inside the camera is a strip of gelatine film two and three-quarter inches wide and usually about 160 feet in length, which is wound upon a small pulley or drum. The length of the film varies for different subjects, and, in the case of a prolonged scene, it may extend to several thousands of feet.

The film is led through a series of rollers and caused to pass directly behind the main lens of the camera, and finally is wound upon a second drum. The object of the rollers is to cause the film to pass behind the lens with an intermittent instead of a continuous motion. At ordinary

speeds this would seem to be a matter of simple accomplishment; but, when we remember that impressions are taken at the rate of forty a second, and that the film, which is running at the rate of from seven to eight feet a second, has to be stopped and started with equal freq uency, it can be understood that the problem was no easy one to solve. The film comes to a rest as the shutter opens, a phase or image is deposited, and the film starts again as the shutter closes. The impressions vary in actual exposure between one-hundredth and one four-hundredth of a second. While the ordinary speed is forty a second, the mutoscope can take equally good pictures at the rate of one hundred per second if it is necessary. The higher speed would be used in photographing the flight of a projectile or any object that was in extremely rapid motion.

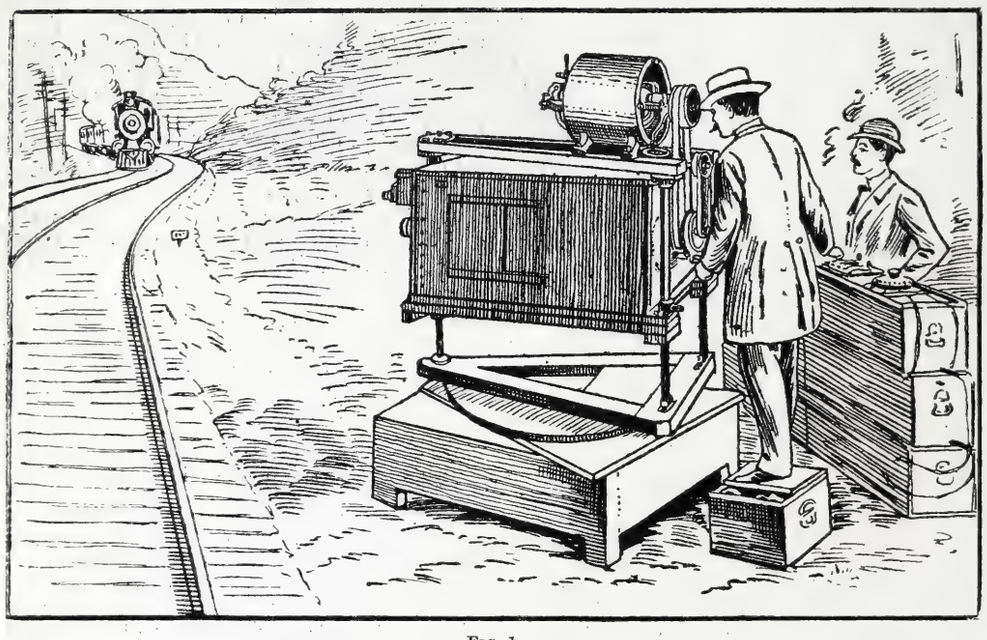


Fig. 1.

The mechanism within the cabinet is driven by belting from the motor above mentioned, and the speed of the motor is controlled with great nicety by means of a resistance box, which is shown in our engraving (fig. 1), mounted upon the storage batteries. The apparatus is here represented in the act of photographing the celebrated 'Pennsylvania Limited' while it was running at the rate of about sixty miles an hour. The mutograph is set up at the side of the tracks upon a solid platform; the stretch of track is properly focussed by the operator, and at the moment that the train comes into sight the current is turned on, the speed being regulated through the resistance box, as explained. By the time the last car of the train has flashed by, 160 feet of film has streamed past the lens, received its 1000 impressions, and been wound with its precious record upon the receiving spool.

After the mutograph has done its work upon the films, they are carefully packed and sent to the New York establishment of the American Mutoscope Company. Here they are taken to the dark room, the interior of which is shown in the accompanying engraving. Ranged along each side of this room is a series of troughs, above which are suspended large skeleton reels, three feet in diameter by seven feet in length, the axis of the reels being journalled in brackets attached to the ends of the troughs. The films are wound upon the reels, and subjected to the action of the various solutions for developing, fixing, &c., with which the troughs are filled, the reels being transferred from bath to bath, until the films are ready to go to the drying room. In this same department are prepared the positive transparent strips for use in the biograph, and the bromide prints for the mutoscope, as will be explained later in the present article.

The reels are then carried to the drying room, where the films are unwound on to large wooden drums, of about the same size as the reels, where they are carefully dried. At the far end of the room are seen the machines for cutting up the bromide prints, and here also is carried on the work of retouching the films and prints, and preparing them for use in the biograph and mutoscope machines.

The biograph (or life delineator) is similar in its general appearance and construction to the mutograph. There is a similar arrangement of rollers and mechanism for controlling the movement of the film, and the machine is driven, as before, by an electric motor, and controlled by a resistance box, which, in the engraving, is shown to the left of the operator. The chief difference observable in the interior of the biograph, as compared with the mutograph, is that the former contains a hand-regulated arc lamp of 5000 candle power, which is placed behind the lens. When a subject is to be thrown upon the screen, a spool containing the positive film is placed in the cabinet, and run with an intermittent motion through the controlling rollers, down between the lamp and the lens, and finally wound upon a receiving spool. In order to ensure that the best effect shall be secured, it is necessary to run the film at the same speed at which it was taken—a result which is obtained by the use of a tachometer. The biograph is at present at work in a New York theatre. The whole apparatus and the operator are enclosed in a cabinet which is located at the back of the balcony. A hole is cut in the cabinet for the lens, and there is a window for the operator. The pictures are thrown upon a large screen upon the stage, and the subject, such as an express train running at sixty miles an hour, is one of the most vivid representations of the kind ever attempted. The audience sees the cloud of steam, the whirring driving wheels, the splashing of the water in the track tank as the engine takes in its supply, the passengers waving handkerchiefs, and the workmen swinging their hats as the train goes by, and then the vacant tract, all of which is represented with a clearness of detail that is truly remarkable. The excellence of the results is due very largely to the relatively great size of the original negatives, which measure $2\frac{1}{4} \times 2\frac{3}{4}$ inches, and are therefore very much larger than anything that has ever been taken in this class of photography.

Perhaps the most novel of the three machines is the mutoscope (fig. 3), which, on account of its compactness, simplicity of operation, and the large size of its pictures, is certain to win great popularity. In this machine the bulk, the complicated mechanism, and the motor of the biograph are replaced by a simple, box-like apparatus, no larger than the cover of a sewing machine. The enlarged pictures, six by four inches in height, are mounted in close consecutive order around a cylinder, and stand out like the leaves of a book, as shown in the illustration. In the operation of the mutoscope, the spectator has the performance entirely under his own control by turning a crank which is placed conveniently to hand. He may make the operation as quick or as slow as fancy dictates, or he may maintain the normal speed at which the original performance took place, and, if desired, he can stop the machine at any particular picture, and inspect it at leisure. Each picture is momentarily

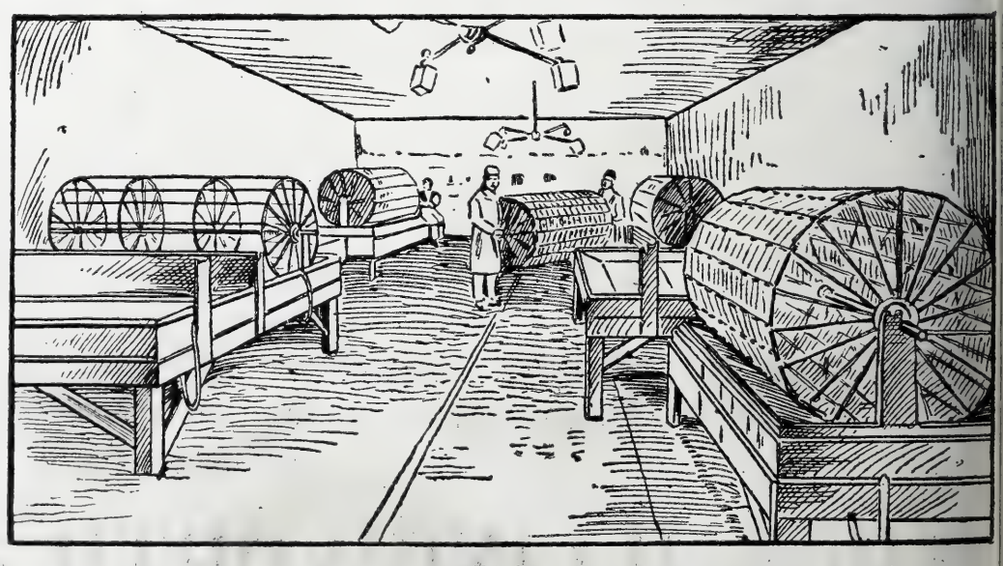


Fig. 2.

held in front of the lens by the action of a stop attached to the roof of the box, which allows the pictures to slip by in much the same way as the thumb is used upon the leaves of a book.

The capacity of the mutoscope is coequal with the camera. It reproduces in motion anything which can be photographed, whether motion of human bodies or movements in mechanism or nature. Thus, the Falls of Niagara, conflagrations, moving trains, animals in action, athletic games and sports, scenes from plays introducing prominent actors in favourite *rôles;* in fact, any scene can be reproduced with

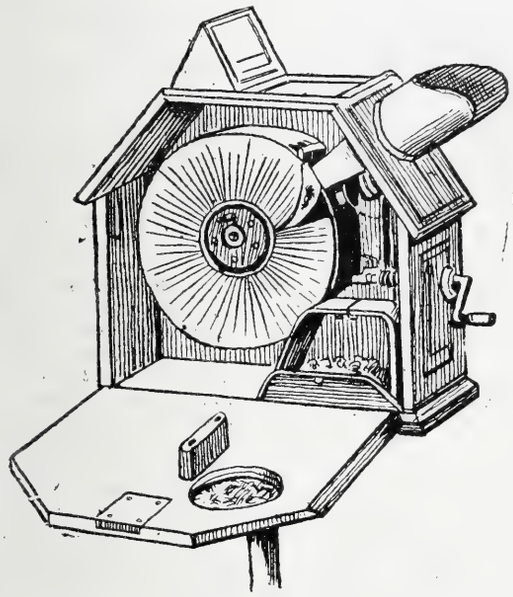


FIG. 3.

perfect fidelity to nature, and with the actual movements presented by the scene depicted in a most realistic way. Important events in public or private life can be perpetuated, such as parades, military, civic, &c., preserving for the years to come the movements and gestures precisely as the scene occurred at the time of its recording by the camera, although some or all the participants in the scene may have long since departed.

Upon the roof of the New York establishment of the company there has been erected a large movable stage for taking photographs of celebrated scenes from plays or of individual performances in which it is desired to reproduce the motions as well as the features of the subject. It consists of a floor of steel I beams which carries a series of three concentric steel tracks. Upon this rotates a massive frame, at one end of which is a stage supplied with the necessary scenery, and at the other end a corrugated iron house in which is located the mutograph. The stage is bolted to the frame, but the house travels upon a track, and may be moved to or fro from the stage as required. The frame carrying the stage and house rotates about the smaller circular track located beneath the house, and may be swung around so as to throw the light full upon the stage at any hour of the day.

ACETYLENE GAS.

[Read before the Edinburgh Photographic Society.]

ANY substance like acetylene, which, in the past, has been merely a chemical curiosity, becomes, when easily and cheaply prepared, practically a new *substance*. This was first effected by Willson in America, although Moissan, a Frenchman, also claims to be the discoverer of calcium carbide, from which acetylene is simply and economically prepared.

On analysis, acetylene is shown to be a compound of carbon and hydrogen. There are a large number of similar compounds of carbon and hydrogen, and they have the general term of "hydrocarbons" given to them. Acetylene, however, forms the commencement of one division of these hydrocarbons, in the same way as marsh gas and olefine are the beginnings of other series.

Confining ourselves to the acetylene family, the first of a series, *i.e.*, the illuminant we wish to speak about, we find it has a composition of C_2H_2. The exact relation between the carbon and the hydrogen is better shown, however, by writing it as $H-C\equiv C-H$. The bonds between the two carbon atoms show that it is what chemists call "unsaturated," and this is proved by the readiness with which acetylene combines with nascent hydrogen to form more saturated hydrocarbons.

As already stated, acetylene is an illuminant of the hydrocarbon family, and an interesting fact about it is that it can be made from wholly inorganic substances. From *it* many more complex organic substances may be produced; and this, with other examples, has been the means of breaking down the old impression of chemists and others that there was a distinct wall of partition between the inorganic world and the products of life functions, or organic matter.

Acetylene is a gas at ordinary temperatures, but with the application of forty-eight atmospheres of pressure, and a lowering of the temperature to 1° C., it may be liquefied. The gas has an unpleasant odour, and burns with a very luminous and sooty flame. When it is passed into ammoniacal copper or silver solution, it is absorbed, and forms compounds, which, when dry, are very explosive. This chemical reaction with the salts of the metals has raised exaggerated fears of the danger from using acetylene. Chromic acid oxidises it into acetic acid, and alkaline potassium permanganate into oxalic acid. Water dissolves its own volume of the gas; but, if salt be added to the water, the acetylene is much less soluble. When heated to a very high temperature, acetylene forms benzine or benzole (C_6H_6), which is the lowest of another series of hydrocarbon homologues.

Acetylene may be prepared in several ways. One method is to treat ethylene dibromide with caustic potash; another is to electrolyse a solution of maleic acid; another is to obtain the gas by striking back a Bunsen burner; but these methods are only of interest from a chemical point of view, and have been superseded by the manufacture of the gas from the comparatively cheap calcium carbide by acting on it with water. The carbide of calcium is made by fusing together, at the temperature of the electric arc, lime and coke, when we get $CaO+3C=CaC_2+Co$. A mixture of sixty per cent. of unslaked lime and forty per cent. carbon, in the shape of coke, is generally used. Charcoal and pure lime, of course, yield the best results; but, in practice, coke, as free from ash as possible, and lime with not more than three per cent. of magnesia are used. The electric furnace is the same as used for the manufacture of aluminium, and the current should be capable of giving 1000 ampères at 60 or 70 volts. The carbide of calcium fuses in the furnace, and is run off as slag, which, on cooling, solidifies into a very hard mass. This carbide is a dark-grey coloured substance of specific gravity of 2·262. It has to be kept free from moist air, as moisture decomposes it. At present this carbide is sold at about 28*l.* per ton, although, if the demand were greater, the price would probably fall to one-half or less, the electric current and the wear and tear of the furnaces being the chief cause of the present price. The Acetylene Company employ the water power of the Falls of Foyers for the electric current used in the manufacture of the carbide.

To generate acetylene gas from the carbide, water alone is necessary. The following equation represents the reaction: $CaC_2+2H_2O=Ca(OH)_2+C_2H_2$, and we have lime as a waste product.

We have before us all the apparatus required for the production of the gas on a small scale. (Mr. Irvine here described the generator and gas holder supplied by the Scottish Acetylene Gas Company, with which he was demonstrating.)

The gas is generated by a small flow of water being directed upon the carbide in the changing vessel, and is received into the gasometer, the generation being regulated automatically. Some difficulty, however, has been found in the generation of the acetylene to the best advantage and with perfect safety, and this has arisen from the attempt to produce too much gas at a time, and also by allowing too much water to act upon the carbide at once. One pound of English-made carbide gives about five cubic feet of gas. Swiss carbide gives about four and a half cubic feet, and German carbide only three and a half cubic feet. Another difficulty occurs when the wetted carbide heats up and forms polymeric products, such as those of the benzine group, which interfere by clogging up the pipes. This may be overcome by not using more carbide at a time than we wish fully to use up, or by allowing only as much water to drip on to the carbide as will be required to fill the gasometer with gas for immediate consumption. The gas prepared in this way contains ninety-eight per cent. of acetylene, with two per cent. of impurities, consisting of air and traces of sulphuretted and phosphuretted hydrogen.

The burner for use with acetylene is a Bray $\frac{5}{000}$. It requires more frequent renewal than a coal-gas burner, as the heat at the orifice decomposes part of the acetylene, and deposits carbon, which chokes it.

The light is highly actinic, and is now being used for ordinary portraiture and printing during the evening or dull days. Twelve sixty-candle burners have been used for drawing-room portraiture with good results. At a pressure of twenty-one and a half atmospheres at 0° C. the gas can be liquefied, and cylinders containing this liquid may in the future form a very convenient way of transporting it into country houses, and also for intermittent use, such as in portraiture. Acetylene gives a light which is from fifteen to twenty times more powerful than coal gas, and five times more powerful than oil gas. Another advantage in burning acetylene is the comparatively small quantity of the products of combustion, light for light. Acetylene gives only from a quarter to a fifth of the amount of carbonic acid product by coal gas.

As to danger. It has been proved that with dry acetylene, free from ammonia, there is no danger of combination between it and the metallic pipes of the apparatus. There is also less danger where a gas tap has been left open than there would be in the case of coal gas, because the acetylene would escape through the burner at the rate of one cubic foot per hour, whilst five or six cubic feet of coal gas would pass during the same time. The result, therefore, of leakage would be safer with acetylene, the reason being that the specific gravity of a gas determines its power of diffusion, and a light gas, like coal gas, with a specific gravity of

0·4 (air being 1·0) would diffuse more readily than acetylene, which has a specific gravity of 0·9.

As to price. If 1000 cubic feet of coal gas costs 3*s.*, the same volume of acetylene will cost 50*s.*, and the advantage therefore seems to lie with the coal gas; but, when we consider that the acetylene light is fifteen to twenty times greater than the coal-gas light, the advantage of the latter is very much diminished. For ordinary lighting it may never replace coal gas, but for lighting villages, railway carriages, large halls, and for photography, lantern projections, &c., it has a great future before it.

The most interesting and promising field for investigation in connexion with the generation of hydrocarbons from carbides has hardly yet been more than touched. The carbides of some metals give, with water at a slightly elevated temperature, other hydrocarbons and hydrogen. If such carbides be mixed with calcium carbide, a mixture of gases is obtained which may be made to approximate to the composition of coal or oil gas. A mixture of carbides of calcium and aluminium generate, on adding water, a mixture of marsh gas and acetylene, which burns without smoke. If manganese carbide be used instead of aluminium carbide, a mixture of marsh gas, hydrogen, and acetylene is obtained, and possibly such mixtures of gas may be found to be preferable for certain purposes.

R. Irvine, F.R.S.E.

TINTING LANTERN SLIDES: AN EASY PROCESS.

No little skill is required to apply colours to lantern slides in the regular way, as brush marks and other defects, although not noticeable when the slide itself is viewed, become glaringly so when the enlarged image is thrown upon the screen.

Thus, for fear of spoiling instead of improving slides that look very well as they are, says a writer in *The Photographic Times*, lanternists hesitate before experimenting in this direction.

But there is a method that is very easy, and in my hands, at least, has given quite satisfactory results. From the manner in which the colours are applied, I call it the "three-finger" process.

I do not work directly on the film of the photo image, but, without disturbing the make-up of the mounted and bound slide, I apply the paint to the outside faces. A good red, blue, and yellow are all the colours required, as secondary colours can be produced by applying coats of the primaries on opposite sides of the slide.

To illustrate: We will take a good uncoloured slide, which will be, for example, the well-known Bible view of Hofmann's *Sermon on the Mount*.

Our three colours, Prussian blue, scarlet lake, and yellow lake, all oil colours that are easily obtained, are spread on our palate, and the finger tip of the first finger charged with the blue.

Holding the slide with a piece of white paper so arranged behind it as to reflect the light through it to the eye, the colour is evenly stamped in a thin coating over the sky, and also over the foliage of the large tree in the shade of which Christ is represented as seated teaching the multitude.

The tufts of grass that are in the picture are also touched with blue, and also such of the clothing of the figures as is intended to be blue, green, or purple.

The second finger is now charged with yellow and the slide turned over, and on the opposite side the yellow is stamped on the foliage of the tree, which, with the blue on the other side, now transmits the desired green.

Also down the tree trunk, and over the grass, ground, and rocks. Also a slight tint to all the flesh that is in the picture. As we go along, the outlines of any colour that has overlapped in stumping can be worked into shape by that simple but effective little tool, the chewed end of a match stick. The third finger is now charged with the red, and on the surface on which the blue was stumped a thin coat is applied to the flesh, which with the yellow on the other side is now of the desired tint.

A little is also put on the tree trunk, ground, and rocks, which are thereby brought to the desired tints of brown. The costumes are then gone over with the different tints to suit the fancy, and the work is done.

The whole thing has taken but a few minutes, and, if on examination the effect is not what is desired, it can be rubbed off and tried over again. When the slide itself is viewed, the coatings of paint may seem to lack smoothness of texture, on account of the marks left by the roughness of the skin of the finger tip; but, as the paint is the thickness of the glass from the plane of the photo image, when the latter is focussed on the screen, the paint is enough out of focus to blend it into a soft and even tint.

Of course, slides prepared in this way must be carefully handled, as the paint being unprotected is easily scratched in handling; but, if scuffed or scratched, the paint can be wiped off with a little turpentine, and a new coating put on in a few minutes.

It should be remembered that slides intended for an oil-light lantern should be painted by the same coloured light as that by which they are to be shown—that is, either by an oil lamp or gas.

Slides painted by daylight show all right by lime or any other white light, but give disappointing results if thrown on the screen by a yellowish flame.

LANTERN SLIDES FOR COLOURING—RIGHT ONES AND WRONG ONES.

[Wilson's Photographic Magazine.]

After colouring lantern slides enough to make a "continuous show" all the year round, including every conceivable subject from the nebular theory of creation to President-elect McKinley, surrounded by a wreath of laurel infested with goldbugs, and "done" upon every conceivable basis from bare glass to dried coffee jelly, I have discovered a fact which I knew all the time, viz., that slides fit to be coloured are just as easily made as those coloured to be "fit." And yet it is the lamentable truth that not one slide in a hundred is made in the best way for the reception of colour.

The shortcomings of slides designed to be coloured may be either technical or artistic, or more likely both. A slide may be defective by reason of poor materials, hasty or unskilful making, accident, or the use of improper chemicals. It may also fail in matters of density, hardness of detail, use of non-orthochromatic negatives, and improper selection of subject, point of view, and illumination. The last three points are beyond the province of the present paper, which will indicate simply the qualities to be sought and to be avoided in making slides designed to receive and project the colours of nature.

Slides designed to be coloured may be made either by the wet-plate or the dry-plate process. Whatever may be urged in favour of wet-plate slides in black and white, I much prefer the *right sort* of dry-plate slides for colouring. Note the italics. I have to colour all sorts, and I get the right sort, from the technical standpoint merely, about once in six or seven times. Some have leather films, alum-tanned, that are about as easy to colour as a duck's back is to wet. Others have soup-stock films, which quickly dissolve under the brush; and still others, innocent seeming, possess latent powers of swift or slow destruction, or spotting or alteration of the colours laid upon their deceptive surfaces. Lastly, I am ashamed to say that sometimes slides are more or less embellished with nasty greasy thumb tracks, which might be highly profitable to "Pudd'n"-head Wilson" in the identification of criminals, but are quite useless to the slide colourist.

The selection of the plates to be used in making slides is of prime importance when it comes to colouring. With all the various methods of a host of brands, there are many that are not the best when they have to submit to the brush. I am not in the pay or devoted to the interest of any plate-maker, but I feel no hesitancy, in spite of that drawback, in naming the plate that makes the best slides (when properly handled) for my purpose. That is Carbutt's gelatino-albumen transparency plate; next the Seed plate and Riley Brothers' plates seem to give best results, but of these I speak from less experience. Most other brands seem to be too soft unless thoroughly alum-soaked, which greatly injures them for receiving even washes of colour. Of equal importance is the developer. I am somewhat suspicious of iron developers. Metol, rodinal, and amidol and their compounds are totally inadmissible, as they react upon the colours, destroying them in a few minutes at times, in a few days at longest. Hydroquinone, eikonogen, and pyro are safe developers, probably the best being the formula printed upon the Carbutt plate box. Cutting down or clearing with cyanide is to be avoided. It rots the films. Use plenty of bromide instead, or make another negative from the slide if weak, and intensify this negative to get a stronger slide from it. Hypo must be very thoroughly eliminated, or it will spot and destroy colours, and eventually the photographic image. Use as little alum as possible and avoid frilling. As often used, the colours crawl and take unevenly, unless the slide is macerated in some solvent that endangers the whole film.

Wet-plate slides are of two general kinds—albumen and collodion. The former are very clear and beautiful, colour well, and have only one great drawback, they are very apt to be full of pinholes. An old maker of these slides says that "the albumen, when setting, has a magnetic affinity for every particle of dust in the room." The slides made by Lévy, of Paris, are albumen plates.

Collodion slides were long my *bête noir*, as all possible abominations were wont to congregate upon a single plate. It is rare now that I encounter one that is unmanageable, but they are often troublesome from one cause or another. The worst I have ever met evidently contained free silver nitrate, as everything applied to them, in the way of colour, and even a resisting varnish, were soon attacked by black patches. Collodion slides should be made with old, ripe collodion, and be hard enough to stand moderate handling. Imperfect cleaning of glass before applying the collodion may cause scaling of the film. Intensifiers, if not well washed out, may react on colours. I have met with collodion slides which, from some cause, apparently chemical, produced myriads of minute bubbles in the colouring material, scarcely visible, not showing upon the screen, but yet not desirable. Sometimes such bubbles have been found beneath the film, and in such case might eventually cause a scaling.

Slides are often varnished. This should never be done. It greatly increases the difficulty of colouring, and may endager the coloured slide in the heat of the lantern, besides almost invariably holding dust specks, which show badly on the screen with the electric projection, which is coming more and more into use. For the same reason bubbles, scratches,

specks in either glass must be carefully avoided. Ragged and ly cut mats often sift dust and fibres between the two glasses of a . Mats, again, may be an unsuspected cause of deterioration of s, both coloured and plain, especially of collodion films. I have noticed a difference in surface where the mat had impressed the s, and many times a fading of the image, a yellowing or almost com- bleaching, has been found in the exact form of the mat. Free rine is the probable cause.

source of great injury to coloured slides is dampness, from which should be carefully preserved. They should also be kept away from ight, and all light, in fact, when not in use. Though permanent in lantern light, there are no transparent colours that will long survive ct sun rays, and diffused sunlight in the presence of the gases of the osphere cannot be especially beneficial. Sealing slides with balsam r undoubtedly is a preservative; but it is a tedious, dirty, and ex- sive process, and a source of continual annoyance to the lantern- ators from oozing out in the heat. To be quite successful, it requires e-glass slides and covers.

he artistic shortcomings of slides are many. Chief in the list stand use of non-orthochromatic negative plates and too great density in elopment of the slides. There is now no excuse whatever for the loyment of any but the best orthochromatic negative plates. If one bts their value, a comparison, for one minute of a bit of foliage and range-coloured flower, taken with an "old-timer" and an ortho plate, teach him the difference.

should always be remembered that the shades of the photographic are so much black and grey, or dirt, in the colours. Nature's colours pure, even if faint, blackness and mud having no place in them. h the majority of slides expected to be coloured there is more less (generally more) mud, that degrades the purity and injures truth and beauty of the result. This might all be obviated by less sity. If one has the skill, retouching of the negative or screening, local development, may be resorted to, so that less density will ear in the transparency. A perfect test of the best state of sity for a slide to be coloured is to place it film down a sheet of white paper. If perfectly right, it should show pure ite in light and detail through the shades, exactly like a print on er. Most slides, however, will be found to show only white in places, l the rest almost an unbroken silhouette. And yet it is expected that se blacks will come out delicate green and rose, and saffron, and even ite, as I can show by many a direction for colouring accompanying les suitable to illustrate Byron's "Vision of Judgment."

have stated that certain dry-plate slides are best, all things sidered, for colouring. There is one exception to be made, if alter- ons are required involving the taking out of portions, a collodion slide uld be made, as the gelatine film cuts or tears out poorly, and will w a line at the edge in the electric light.

For moonlight and night and storm effects, slides should be made, if sible, enough darker than usual to be about as dense as the effect ired, leaving only the colour to be added. I advise this, as all build- up with body colour is best avoided if possible, the photographic n having more transparency and less granulation.

Collodion plates, again, are best for these effects, as light, stars, moon, , can be readily taken out. The tone of a slide may materially assist e colourist. For landscape subjects a decided blue or cold purple tone desirable; for portraits and figures the tone may be warmer with vantage.

A. G. MARSHALL.

THE LARGEST SPECTROSCOPE IN THE WORLD.

ACCORDING to an American contemporary the largest spectroscope in the rld has just been completed by Professor John A. Brashear, of legheny, Pa. It has been made especially for Dr. Hans Hauswaldt, a althy scientist of Magdeburg, Germany, where it will be used in ysical research, and it is expected that many important discoveries ll be made with its aid. The two most powerful spectroscopes now in e are at the Royal University of Dublin, and the McGill University of ronto, Canada. These instruments were also made by Professor ashear.

The powerful concave grating instrument is 21 feet long, and will require room about 28 feet square in which to operate it. It is to be used for ysical investigations of a very high character, and the design and con- ruction were settled upon by Professor Brashear and Dr. H. Kayser, of e University of Bonn.

The grating to be used on the powerful spectroscope has a 6-inch erture, and is ruled with 110,000 lines. So accurately are these lines led that there is no difference any greater than three-millionths of an ch between any of them. This instrument is so powerful that, where ordinary spectroscope would show from 100 to 200 lines belonging to e spectrum of iron, it will reveal more than 2000. It used to be con- dered that a spectroscope that could show the sodium lines double was e of great power. The great instrument to be sent to Germany not ly shows each of these lines double, but with the sun low in the eridian as many as fifteen lines may be seen between the sodium lines. he new spectroscope has its greatest power, however, in the way of photography. The spectrum of the sun has been photographed to a length of over 60 feet, literally crowded with lines from one end to the other. It is so arranged that, no matter what part of the spectrum it is desired to photograph, the photographic plate is always in focus for every part of the spectrum.

"This large instrument is also valuable in making comparisons of anything that may be burning in the sun," said Professor Brashear, in speaking of his great work. "Suppose, for instance, we wish to determine if the metal calcium is in a state of gas in the light that is coming from the sun, we have only to turn the sunlight into the slit of this great spectroscope and photograph in the centre of our plate the centre of the sun.

"A bar is now placed over this part of the plate which has received the impression of the solar spectrum, and now we turn on an electric light, in which we have placed a small piece of pure calcium. In a very brief time the spectrum of the calcium is photographed above and below the spectrum that came from the sun. The plate is now developed, and here we have a picture of the solar spectrum, running as a narrow strip between the photograph of the metal we have taken. We can see at once the coincidence of the lines of the metal with any lines that may be in the sun. If the lines are in absolute coincidence, we may infer from the law of probabilities, which increases as the lines increase, that the metal we have burned in our electric arc is burning in the great fire of the sun.

"Many hundreds of these photographs have been taken, and we are now almost as certain of the elements that are burning in our great luminary as those that we burn in the furnaces of the metallurgists. So it is with the gases and, indeed, all the chemical elements. Yet, strange to say, while we here on earth recognise oxygen as the great supporter of combustion, the most careful researches with the spectroscope have failed to show the existence of oxygen in the sun. I have in my library an elaborate little manual giving Professor Draper's scientific reasons and proofs that oxygen is burning in the sun, but it has been strongly proved the opposite.

"Extraordinary care has been taken to make the instrument as absolutely perfect as is possible for human hands. The German physicists are the most exacting scientists in the world, and their tests of the great spectroscope will be most rigorous. Dr. Hauswaldt has established one of the finest laboratories of its kind in the world, and he has associated with him in his work the best German physicists of the day. He intends, I understand, to devote his fortune and the rest of his days in making advanced researches. His laboratory now far excels those in this country, and the instruments he is talking of adding to the equipment will make it even more admirable. I look for important discoveries in physical science from the famous little town. The circumstances and surroundings certainly favour it.

"It has been my great regret that I have been unable to photograph the instrument just made. I have tried, but it is so large that some part of it is always placed out of focus in an exaggerated fashion. A camera would have to be placed 50 feet away to get any results at all, and then they would be very unsatisfactory. I have always had to be satisfied with a mere recollection of the instruments made."

EXPLOSION OF AN OXYGEN CYLINDER.

MR. A. P. WIRE writes to a recent number of the *English Mechanic*: "Last autumn a 20-feet Brin's oxygen cylinder exploded during a fire at Leytonstone. The fire broke out at about one a.m. on Tuesday, August 11, in premises adjoining the headquarters of the Leytonstone Camera Club, and the following account of the explosion was given in the local paper at the end of the week:—

"'The fire brigade was soon there, and in ten minutes at work playing on the buildings. By this time, however, the fire had obtained a complete hold of the premises, and so fierce was the blaze that it forced its way into the headquarters of the Leytonstone Camera Club, this fact being emphasised at about a quarter past one by a loud explosion. The cause is attributed to the flames reaching some oxyhydrogen gas which was stored in the Club's room. The force of the explosion may be judged, when we state that it was heard all over Leytonstone and, it is said, as far as Canning Town. People were roused from their sleep, and came hurrying in fright to learn the cause of the terrible noise. The firemen present, who were busily engaged in playing on the burning shop (the neighbouring premises) at the time, had a narrow escape. The houses in the immediate vicinity were severely shaken, and the large fanlights over the doors of Mathon House and Poplar House were completely shattered. The force of the shock was so great as to blow out the street lamp opposite.'

"There is no exaggeration in the above statement, and nothing wrong, except that the steel cylinder contained only oxygen, not oxyhydrogen. At the time of the fire the bottle was nearly, if not quite, full of gas. I was away on holiday at the time, but our folk at home—and we live three-quarters of a mile away from the scene of the fire—were waked by the explosion. As soon as I returned I went to see the remains of our Camera Club's premises, and found the salvage corps in possession. The headquarters of our Club consisted of a studio and dark room built over a

short passage leading to a large room known as the 'assembly room.' As this studio was built of corrugated iron lined with match lining, with, of course, a space of about two inches between wood and iron, and with a grand supply of air from the passage beneath, nothing whatever could be more adapted for burning rapidly and fiercely, and the explosion really blew the studio to pieces, and so probably stopped the progress of the fire. The oxygen bottle stood in one corner where the fire first caught the studio. I asked the man in charge if he had seen the remains of the cylinder, and was informed that several gentlemen had been down, amongst them a chemist, and they said that the bottle had been blown to pieces, or gone away like a rocket, no one knew where—at all events, not a bit of it had been seen. Being a well-known member of the Club, I asked the owner of the premises and the salvage man to send the remains of the bottle to me if they found it among the *débris*, and pointed out the spot immediately underneath where it stood as the likely place to find it. I could not believe that a steel cylinder would go to pieces or be shot away like a rocket without being found somewhere not far off. My prediction was verified. The burst bottle was found exactly underneath the spot where it stood, and I have the bottle still in my possession, the photographs showing its exact state. Not a piece of the metal nozzle was left; but the mouth of the cylinder is filled with what appears to be fused metal. The force must have been very great to rend the bottle thus. It is certain that, as the bottle contained only oxygen, the explosion was mechanical, not chemical. It was caused by the intense heat softening, and, of course, weakening, the bottle, and in enormously increasing the expansive power of the confined gas. People here talked about the great danger of such cylinders; but this explosion in no way proves steel cylinders charged with condensed gas to be ordinarily dangerous. All the property and contents of the Camera Club studio were insured and the claims settled by the companies; but it was said that such bottles would, perhaps, not be allowed on insured premises at the ordinary premium."

[Reproductions of the photographs show the state of the bottle as described by Mr. Wire.]

LIESEGANG'S SLIDE-CHANGING APPARATUS.

Herr F. P. Liesegang's invention serves not only to release the pictures, but also to actuate one or several flaps or other devices adapted to intercept the light rays while the picture is being changed.

In the accompanying drawings,

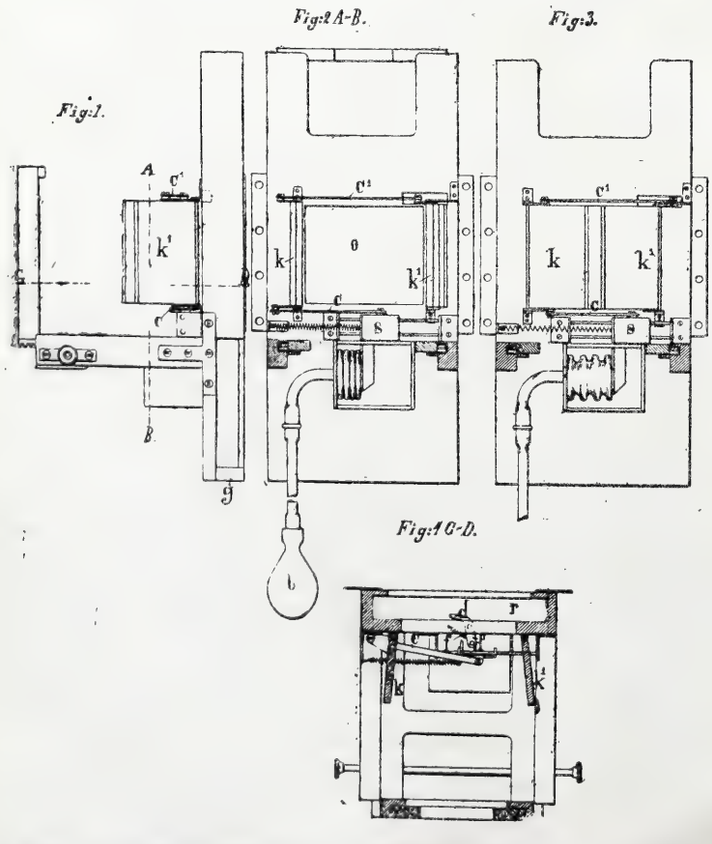


Fig. 1 is a side elevation of a projecting apparatus embodying the invention.

Fig. 2 is a vertical section along line A—B of fig. 1; fig. 3 is the same after the hinged flaps have closed the opening, o.

Fig. 4 is a horizontal section along line C—D of fig. 1.

The transparencies or picture slides are placed upright in a vert guide frame, r, so that they drop automatically when the stop or rete ing device is released. In the example shown by the drawings release of the stop and the closing of the flaps is effected by pneum pressure through a flexible pipe provided with an air bag, b, but the sa result could be produced by other known means.

The pressure on the air bag, b, sets in motion the slide block, s, wh in its turn, closes the flap, k, by means of the connecting rod, c. flap, k, is connected with the flap, k^1, by means of a rod, c^1, and acts the same, so that the flaps turn in opposite directions and close opening, o, simultaneously from both sides.

The slide block, s, has a flange or projection which, during its moti comes in contact with an arm, d^1, of a short lever, d, supporting transparency or picture slide, together with its frame. Consequently arm, d, which had been held in its place by an antagonistic spring, f withdrawn, and the picture slide which had been exposed to the ligh allowed to drop, and its place occupied by another slide which had b inserted above the same.

The exposed slide is caught by a lug, or cross piece, g, situated at bottom of the guide frame, and is taken out sideways.

In the example shown by the drawings, the supporting arm remains drawn back as long as the pressure on the air bag, b, contin but the arrangement may be modified so that a pressure on the ba will cause the lever, d, to recede for a moment only, after which it snap back without being influenced by the return motion of the sl The guide frame, r, may be adapted to hold several slides or image at the same time, in which case the latter are preferably supported on inclined race, so that their weight will not exert any undue influence the plate which has to be exchanged, and the said picture slide may off without injury.

Instead of flaps, k, k^1, other suitable shutters may be employed.

The Italian electrical journal, *L'Elettricista*, contains an articl Professor Mosso and Mr. Ottolenghi, in which they describe their researches made to test the poisonous action of acetylene on var animals, such as dogs, birds, frogs, and rats, &c. They found it to strong poison. A small quantity in the air, or inoculated in the bl is followed by death, and, even when the animals are resuscitated fresh air before death, they die afterwards. A mixture of twenty cent. of acetylene in the air is followed by death in one hour.

Brixton and Clapham Camera Club.—Thanks to Mr. G. C. Harri a lantern exhibition of about 200 coloured slides by native Japa workers was given at the above Club on Tuesday, April 27, and gave members cause to respect the photography carried on in that di part of the map. The appearance of the slides was very neat, being used for binding, while their photographic quality was of a high standard, and the colouring marvellously tasteful and delicate. subjects comprised landscape, studies of home life, employments, sp native warriors, &c., the whole being probably the most interesting, certainly the most novel, lantern show which the members have see some time.

Mr. T. H. Rumsey, of Sydney, writes to the *Australian Photogr Review:* "Knowing that many of your readers are interested in la work, I send you the following account of an accident that occurr me last week, which might have had serious results. I had received days before a cylinder of oxygen, and when it arrived I put o pressure gauge, and found that the cylinder contained about thirty feet. Before using the gas I again screwed on the gauge, to show of my assistants how much there was in it, and immediately I tu on the valve the gauge exploded with a terrific report, so loud th brought in a number of people to see if any one was hurt. It found that the spring tube had been broken, and the pressure co suddenly on to the dial had blown it out, and broken the glass fragments, a great deal of it into such fine dust that at the we thought it was smoke, only a few small pieces could be f afterwards, and the gauge was completely wrecked. I had seen time ago a bit of advice about using the gauges, and, fortunately fo I have always followed the advice—that, is never to have the face gauge turned towards you *while you are turning on the pressure.* the pressure is once on the gauge, there is not the same chance of an dent. If my face had been near it, I must have been blinded for li perhaps killed. As it was, my arm was caught by the edge of the e sion, and battered about a good deal. I thought at the time it was c by the flying pieces of glass, for it was cut and bleeding in a hun places at least, but now as I write I am more inclined to think it wa concussion of the gas itself that did the damage, as no pieces of were found in the wounds. They were not very deep, and now (a after the accident) the arm is nearly well. My assistant caught pieces of the glass in one of his hands. I should not trouble you this, only that I think it might lead others to be careful, as the nex might not come off so lucky. The gauge had been in use for about years, and was of the usual kind for the purpose made for oxygen and was indexed up to 2000 lbs. I have still its companion for hydro but you may be sure I shall use it very carefully in future."

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*June* 4, 1897.

THE LANTERN RECORD.

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LANTERN MEMS.

THE disastrous fire in Paris, like most catastrophes, has read to he civilised world some awful lessons. To the lanternist and ntertainer it points out the vital necessity of having, first of all, safe pparatus, and next that those in charge of it, or who have anything o do with operating, should be qualified or experienced, and under-tand the nature of the chemicals or gases they employ. Sulphuric ther, at the best of times, is a very risky thing to have anything to o with; but, when one man attempts to fill an ether saturator in a lark room filled with people, and another man holds a light, no vonder there is a blaze!

* * * * *

IT is not an enviable advertisement for the particular saturator ised on the sad occasion to be illustrated, both in perspective and ection, in the Paris technical papers; but, as any saturator would ave been unsafe if served in the same way, it would not be fair to ame this, although, as I believe I pointed out a year or two ago, ike others of its class, the provision for filling is, if not inadequate, t least awkward, so that, supposing there was sufficient diffused ight in the room to have seen to refill, I question, under the ex-citement of the audience waiting, whether any one could have done t without an overflow. It cannot be too well known that, with ether and a draught from an open window, the fumes will travel right across a room, and, if a naked flame is anywhere there or a fire burning in the grate, will become ignited, and travel back like a train of gunpowder, and reach the main supply almost in-stantaneously.

* * * * *

I THINK it will be necessary for apparatus and materials that are of the character of oxy-ether apparatus and sulphuric ether to be labelled indelibly "dangerous," in the same way as bottles containing poisonous substances are labelled "poison;" and special cautions and instructions for use should accompany each instrument, and be affixed to the box containing the apparatus, if it cannot be attached to the instrument. It might be as well to add, after the word dangerous, "not to be used without first reading instructions." I often feel that not enough pains are taken to see that the apparatus is properly understood by the purchaser on the part of some suppliers of these technically dangerous things, and in the hands of inexperienced persons it is no wonder they go wrong.

THERE was a time when the oxyhydrogen light was a somewhat risky light to use, when careless people had human weights to sit or stand on the gas bags; but now, with the oxygen gas in properly tested steel cylinders and automatic regulators of a reliable type, provided the operator knows his work, the chance of any accident is reduced to a minimum. It, however, should be a golden rule that some one person be made responsible for the proper arrangement of the apparatus, and that all details are in order. The oxy-ether is a beautiful and useful light; but soon after using it, some ten years ago, it was apparent to me that in the ordinary way it is not a satisfactory light for an amateur to employ, or for use in public exhibitions unless under very strict regulations. In the case of the apparatus used in Paris the saturator was of an English pattern and probably English make, but was supplied by one of the Paris lantern houses, and the illustration bears the name of such supplier Now, what is more likely than that the directions sent by the English house when executing the order were not translated, and so no special "caution" given to the purchaser or user? With the fearful responsibility on entertainers since panic and fire have recently been so disastrous, they cannot be too careful in the selection and use of their apparatus, and will do well to think twice before they send their orders to grocers, linendrapers, and other places of the store type for technical apparatus, for the sake of a possible five or ten per cent. saving, with a probable thirty or fifty per cent. loss by having an indifferent or damaged article, through want of knowledge and experience of the dealer in selecting it, or assistants in keeping the apparatus properly in order in stock.

* * * * *

THE Royal Society's *Conversazione* on May 19 was, as usual, a brilliant affair, and the exhibits interesting. The optical and lantern portions were perhaps not quite so telling as on some previous occasion, but there was plenty to see and take notice of. One missed this year, at the press view, the convenient arrangement of making a round of the exhibits, and the professor or exhibitor giving a short description or lecturette to the representatives collectively. It was thought by the management that it would be better for each representative to go round separately; but I don't think it was generally as well liked by the press, and it decidedly gave a great deal more trouble, or, at least, involved a lot more "talk" for the exhibitors.

* * * * *

MR. A. A. C. SWINTON demonstrated with the cathode and X rays, and showed how tubes could be made to vary the penetrative value of the X rays without altering the vacuum. First, by altering the distance between the cathode and ante-cathode; second, by varying the size of the cathode; third, by altering the position of the cathode relatively to the glass walls of the tube; and fourth, by means of a variable magnetic field. The tube for altering the distance between the cathode and ante-cathode was particularly practical, and permitted of the variation being made quite readily.

Professor Shelford Bidwell had some rotating discs for showing subjective colour phenomena, especially the "negative after-images," where a coloured object, under strong illumination, is caused to assume a tint complementary to its natural hue; thus a rose-coloured green and leaves painted red appeared to the eye as a pale red rose and green leaves. The apparatus employed was as follows: a disc, with about one-half of the surface made black, and the other half white, an opening being cut at the black and white portions. When the design is seen through this opening, on the disc being rotated (in this instance, by a small electric motor) and in a suitable light, the result is as above; or, if the design be in black lines on a white ground, the design appears red. This phenomenon, it is stated, depends on the fact that a bright object, when suddenly exposed to view, appears for a moment to be surrounded by a red border.

* * * * *

A most powerful Wimshurst electrical influence machine was exhibited by Mr. J. Wimshurst, and when the twenty-four discs, each three feet in diameter, were made to revolve, a spark thirty-four inches between the terminals could be obtained, and as much as twelve feet when used with a table covered with foil. The machine was furnished with three poles, so that one could be negative or positive at will, and the other two the reverse as desired, so that two separate streams of discharge can be simultaneously used. Sir Henry Trueman Wood exhibited examples of the Dansac-Chassagne process of producing photographs in colour, but there were no projections of the transparencies on the screen. Mr. Eric Bruce showed some paper prints of photographs taken of the subjects projected on his aerial graphoscope, and were interesting as showing that objects placed behind the revolving lathe can be seen through the transparent image or ghostly picture projected.

* * * * *

Professor Roberts-Austen's apparatus for micro-photography showed the possibility of obtaining photographs of metals and alloys under high magnification, and Mr. C. B. Butler had a beautiful diffraction kaleidoscope for showing the lovely spectrum, produced by simple gratings having 6000 lines to the inch, and combinations of gratings in straight and concentric lines.

* * * * *

A very useful piece of apparatus was exhibited by Mr. J. A. B. Carver and Mr. J. E. Barnard for assisting in the control of the electric arc for projection, and enabling the operator to select the best angle for the carbons and the most brilliant part of the arc, and have an index by means of which it could always be kept truly central. The method adopted was by means of a pinhole and screen glass fitted in a tube adjustable at the side of the lamp to get an image of the arc, a scale or gauge being on the ground glass to always show vertically and horizontally the position, so that, by means of the adjustments of the lamp, the arc can be instantly recentered. I believe many years ago a somewhat similar contrivance was used at the Society of Arts, when a series of photographs were being taken of the throat and the vocal chords for illustrating a book on "Voice Production," the electric arc light being used and passed through a bath of water so as not to burn the subject's throat. The greatest nicety was required in centering the light and keeping the illuminated area uniform, that a system of miniature projection was resorted to and a pinhole apparatus used to guide the operator in charge of the electric regulator.

G. R. Baker.

ARTIFICIAL LIGHT: MODERN METHODS COMPARED—ELECTRIC-INCANDESCENT, WELSBACH, ACETYLENE.

[A lecture delivered before the Franklin Institute.]

[The lecture was introduced by experiments to show the appearance of various colours when viewed by the different lights. Two surfaces of the same colour were held up at an angle between two sets of lights, each set containing eight lamps or burners. The two sets of lights to be compared were placed at a distance of about six feet from each other on the lecture table. Screens were placed in front of the burners, to shield the eyes of the audience from the direct glare of the lamps. In the space between lamps colours were shown on large pieces of cardboard, doubled over at the middle so that the two sides could be held at an angle to each other. This allowed one surface to be illuminated by one set of lamps, and on by the other. The audience could observe each surface at the same time and thus compare the colours as they appeared to the eye.

A second series of experiments consisted in viewing colours of a slightly different hue, which appeared of nearly the same hue when held in one position between two sets of lamps, and of a widely different hue when the colours were reversed so as to be lighted by the opposite set of lamps.

Many colours appeared of a different shade when viewed by the acetylene and by the Welsbach lights. Some of the colours appeared brighter under the acetylene light than under the Welsbach, and this especially so in the case of the lighter shades of pink, whereas the reverse holds true of some other colours. On holding the hand between the Welsbach and acetylene burners, the side of the hand illuminated by the Welsbach light appeared to be of a yellowish hue, and that illuminated by the acetylene exhibited the natural pink tint. The acetylene, therefore, made the hand appear more lifelike than the Welsbach light.

Ordinary gas, and the incandescent electric light also produced more lifelike tints when the experiment was made of holding the hand between them and a Welsbach lamp.

Experiments were described, which had been made before the lecture in which the apparent tints, when viewed by the different lights, were compared with the tints when the colours were viewed by daylight. The acetylene flame was found to show the light pinks or flesh colours much more nearly in their natural tints, or their colours when viewed by daylight, than the Welsbach. The same results followed for incandescent electric light and ordinary gas, when burned in a flat flame, both of which brought out the lighter shades of pink more truly than the Welsbach. The experiments demonstrated that there is a very slight difference in favour of the acetylene over the incandescent light in bringing out delicate shades of pink, and that ordinary gas burned in a flat flame burner comes next in this respect.

Some colours other than pink were found to appear more nearly as their true tints under the Welsbach than under the other lights in the experiments where the lights were compared directly to daylight.]

Candle Power developed per Cubic Foot of Gas. Electrical energy to produce the Electric Light and proportion of total energy transformed into Light. Also, relative Heating and Contamination of the Atmosphere by Carbonic Acid for equal Candle Power.

The figures for the various methods of illumination are given in Table I., in order that they may readily be compared.

TABLE I.

Kind of Light.	Candle Power of Gas on the 5 Cubic Feet per Hour Basis.	Gas required per Hour for 16 Candle Power in Cubic Feet.	Heat of Combustion of Gas in B.T.U. per Cubic Foot at 60° F.	Total Heat in B.T.U. for 16 Candle Power per Hour.	Percentage of Total Heat converted into Light.	Cubic Feet of CO_2 Produced per Hour per 16 Candle.
1	2	3	4	5	6	
Illuminative water gas { Flat-flame burner.....	20	4·00	700	2800	0·6	3
Illuminative water gas { Welsbach ...	70	1·14	700	798	1·9	1
Acetylene.....	200	0·40	1420	568	2·7	0
Incandescent electric.....	—	—	—	250	6 2	0

It will be seen, from the figures given in Table I., that acetylene gives ten times as much light as ordinary illuminating water gas when the latter is burned in a flat-flame burner, and about three times as much when the latter is burned in a Welsbach burner.

The percentage of the total heat of combustion of the gas transformed into light is also greater for the acetylene than for the ordinary illuminating gas. For a given illumination the atmosphere is vitiated by the carbonic acid formed in burning the acetylene to a slightly less extent than when burning the ordinary illuminating gas in a Welsbach burner.

The figure for the candle power of the gas on the basis of five cubic feet burned per hour, given in Table I., is from my own experiments. The figure for the Welsbach is derived from the results obtained in tests of both old and new mantles on the latest form of lamp, and is safer for ordinary practice, as it is nearer to that obtained with old mantles than to the results obtained with the new.

The candle power given in the table is an average of the candle power in a horizontal plane passing through the lamp centre. The spherical candle power is less than the candle power so measured, but the propor-

ween the spherical candle powers would be about the same as the pro-rtion between the candle powers measured in a horizontal plane, or thin the range of variation of the experimental results, so that com-rative figures may be obtained by using the latter.

Safety. Explosive Properties of Acetylene.

If 3 per cent. of acetylene be mixed with air, an explosive mixture is oduced. In the case of hydrogen 5 per cent. is required, and for coal s 8 per cent. The maximum amount of acetylene that can be mixed th air to form an explosive mixture is 82 per cent., and the correspond-g figure for hydrogen is 72 per cent.

It, therefore, appears that acetylene is more explosive than either ydrogen or coal gas. As the burners used for acetylene would discharge less amount of gas—say one-fifth that of an ordinary gas burner—the cidental opening of a burner would cause the atmosphere of the room, a whole, to be much less contaminated in a given time than with coal as. On the other hand, acetylene gas is so much more nearly of the ensity of air than ordinary illuminating gas, that it will not be diffused rapidly through the air in case of leakage, and will have a greater ndency to collect in a partly enclosed space, and thus cause an explosion case the gas were ignited.

[Experiments were made in which acetylene and ordinary illuminating as were exploded when mingled with air. The gas was allowed to scape from a burner into a tube placed at an angle. The explosion roduced by the acetylene was much more severe than that produced by ne illuminating gas.]

In regard to the explosive properties of acetylene itself, much may be aid. When carbon and oxygen unite to form the compound called cetylene, heat is absorbed. According to Berthelot, if gaseous acetylene, nder a pressure of about fifteen pounds above the atmosphere, or over, e ignited by a spark, or by a heated platinum wire, it will decompose xplosively without the presence of air. The explosion becomes more iolent as the initial pressure is increased. In exploding, the carbon and ydrogen are dissociated, and the heat absorbed in the original formation s set free. This heat, according to Berthelot, is sufficient to increase the emperature (provided the pressure be kept constant), about 5000 degrees Fahrenheit, or to increase the pressure to eleven times the initial (if the volume be maintained constant). At atmosphere pressure, however, Berthelot found that acetylene gas containing no air could not be exploded; for, if a spark were generated in it, or even if fulminate were exploded in it, there would be no decomposition into the elements of carbon and hydrogen, except near the point where the spark, or fulminate, acted on the gas.

Berthelot also found that liquid acetylene, as transported in tanks under pressure, would explode as readily as the gas. In one case he exploded liquid acetylene in an iron tank by means of fulminate of mercury, and shattered the tank to pieces. He also made experiments to determine if blows or shocks would start explosions in cylinders of the liquid. He found that a shock would not of itself start an explosion, but that, when steel cylinders of the liquid acetylene were smashed, the blow was usually followed by an explosion, probably produced by the sparks generated by the friction of the pieces of broken steel. He states that local elevation of temperature may produce compounds evolving heat, and finally cause an explosion, and also that the sudden opening of a stop cock may produce local heating and an explosion.

The investigations of Berthelot on the explosive properties of acetylene show how dangerous the gas is when stored under pressure higher than that of the atmosphere. That such is the case is borne out by the fact that a number of accidents have occurred where it has been used under such conditions.

In the Pictet Works, in Paris, acetylene is compressed in steel cylinders that have previously been tested to 250 atmospheres. A short time ago, a cylinder of this description, of large capacity, exploded at the Pictet Works, killing two workmen and injuring another. The two men were torn to pieces, and a part of the works was blown down.

There is another case on record where a cylinder of acetylene, fitted up to light a dwelling house, exploded and seriously injured a tinman and his labourer who were at work upon the premises.

An explosion of liquid acetylene, resulting in the death of four persons, took place in a Berlin suburb some time in last December. This explosion occurred at the time when a chemist named Isaac, who had for some time experimented with acetylene with a view of depriving it of its dangerous qualities, was preparing an exhibition of the results of his experiments, a record of which was to be presented to the German Emperor. The use of acetylene is prohibited in Germany, owing to its explosive character, and it was to deprive it of its dangerous qualities that Mr. Isaac made his experiments, and thereby met his death.

By an explosion of a cylinder of liquid acetylene at New Haven, in January, 1896, three persons were killed and four injured. The explosion occurred while experiments were being made on a regulator to reduce the pressure in the tanks to that required at the burners.

An explosion occurred in Jersey City, about one year ago, when it was attempted to generate the gas from the carbide under pressure. This shattered the roof of the building, the apparatus being in the upper story, and demolished the woodwork in the neighbourhood of the generator; but, fortunately, no one was near enough to the generator at the time of the explosion to be seriously injured.

All the above explosions are cases in which the acetylene was under pressure, and exploded in the same way as ordinary dynamite or gunpowder, that is, by the decomposition of its own elements without the aid of the oxygen of the air. There have been accidents, however, where it is probable that the explosions were caused by the mixture of air with the acetylene.

For example, an accident took place at Lyons, a few months ago, in a café lighted by acetylene generated on the premises. The explosion produced much damage, and killed two persons.

Another explosion—or, perhaps, it might be called a case of accidental ignition—of the gas occurred in Jersey City last January. The liquid acetylene was being blown from a tank into a felt bag in order to obtain solidified acetylene, or snow, in the same way that snow may be obtained from carbonic acid. An explosion of the escaping gas occurred, which set fire to the mass of solidified acetylene. One of the workmen was severely burnt about the face and hands.

In view of the above practical demonstration of the danger of acetylene gas under pressure, it would seem unwise to use it in that way; and, even when generated on the premises at atmospheric pressure, great precautions should be employed to prevent explosion on account of the admixture of air.

Relative Costs for Equal Illumination.

The costs per hour for a production of sixteen candle power of light, in the city of New York, are shown in Table II.

Table II.

Incandescent electric light at one per cent. per lamp hour		1·0
Illuminating water gas.	Ordinary burner, 4 cubic feet, at $1·25 per 1000 cubic feet	0·5
	Welsbach burner, 1·14 cubic feet, at $1·25 per 1000 cubic feet	0·17
Acetylene employed for Municipal distribution.	Calcium carbide, furnished to gas company and converted into gas for $40 per ton*	0·5
	Calcium carbide, furnished to gas company and converted into gas for $19·50 per ton†	0·17

The price at which calcium carbide would have to be furnished for domestic lighting, to be as economical as kerosene oil at eight cents per gallon, is $45 per ton. The compressed liquid acetylene would have to be furnished for six and a half cents a pound to be as economical as kerosene.

It will be seen from Table II. that, to compete with an ordinary illuminating water gas selling at $1·25 per 1000 feet in municipal distribution, the carbide would have to be furnished to the gas company and converted into gas for $40 per ton, to net the gas company the same profit, and to be as economical to the consumer as the ordinary illuminating gas burned in a flat-flame burner. To be as economical to the consumers as ordinary gas burned in Welsbach burners, it would have to be furnished to the gas companies and converted into gas for $19·50 per ton.

It is further shown that, to be as cheap as kerosene in domestic lighting, the carbide would have to be supplied to the consumer at $45 per ton, and the compressed liquid acetylene would have to be supplied at six and a half cents per pound.

The figure for the Welsbach burner in Table II. is obtained by adding to the cost of the gas 0·03 cents per hour per sixteen candle power to replace mantles, which are assumed to cost fifty cents, and last 500 hours on a lamp furnishing fifty candle power. The difference in cost in favour of the Welsbach will disappear, to a great extent, in practice; for, if ordinary gas burners are replaced by the Welsbach, the total amount of illumination, as a rule, becomes greater, and, if three times as much, the cost of gas to the consumer per month would be the same with the Welsbach as with the ordinary gas burner.

The figures for the acetylene are obtained in the following way:—

Assume a plant which is furnishing an illuminating water gas at $1·25 per 1000 cubic feet. If this plant were converted into a plant to furnish acetylene gas, there are certain expenses, such as the cost for distribution, including the maintenance of the plant, collection of bills, office expenses, &c., that would remain about the same per day for the acetylene as for the water gas. These constant expenses would practically be all other expenses, except those involved in making the gas and storing it in the holder. To simplify matters, let us consider a plant of any given capacity, say, 500,000 cubic feet of gas per day. Then we have:—

Paid by consumers per day, 500,000 cubic feet at $1·25 per 1000 cubic feet	$625·00
Cost of gas in holder, at 40 cents per 1000 cubic feet‡	200·00
Constant expenses per day, together with profit of gas company	$425·00

* To replace flat-flame burners.

† To replace Welsbach: cost of replacing mantles of Welsbach lamps, included in the estimate.

‡ The cost of gas stored in the holder is less than 40 cents per 1000 cubic feet in many large plants, and the price that the gas companies could afford to pay for the carbide would be proportionally reduced. For example, if the gas were stored in the holder for thirty cents per 1000 cubic feet, the carbide would have to be furnished to the gas company and converted into gas for $30 per ton to be as cheap as ordinary gas burned in flat-flame burners.

To furnish the consumers with the same amount of light that they obtained with the flat-flame burners and the ordinary illuminating gas would require one-tenth the volume of acetylene; hence one-tenth of 500,000, or 50,000, cubic feet of acetylene would have to be stored in the holder for $200, in order that there should be the same profit to the gas company. This 50,000 cubic feet would be produced by five tons of calcium carbide; hence the cost of one ton of calcium carbide, together with the cost of converting the carbide into gas, would be $40 to compete with ordinary gas at $1·25 per 1000 cubic feet, burned in flat-flame burners.

To compete with ordinary gas burned in Welsbach burners, the amount of acetylene stored in the holders would be in the ratio of 70 to 200 to the amount of ordinary gas required for equal illumination, or we would have to store 175,000 cubic feet in the holder for $200. In addition to this, the cost of the mantles replaced per day in the Welsbach lamps should be included, which would be $140, making a total of $340. To produce the 175,000 cubic feet would require 17·5 tons of calcium carbide, and it would have to be furnished at the gas works and converted into gas at about $19·50 per ton.

It may be claimed that to replace ordinary gas in an existing plant by acetylene would be making use of a plant much too cumbersome for the purpose, and that the interest on capital investment and depreciation would count more heavily against the acetylene than in a plant specially constructed for the purpose. On the other hand, in a plant specially constructed for acetylene, the system of mains for transmission of the gas would have to be laid with much more care than for ordinary illuminating gas, and special piping might have to be used, so that the capital investment of a specially constructed acetylene gas plant might be as much or more than for one furnishing ordinary illuminating gas.

If one-tenth as much acetylene were used for a given illumination as with the ordinary gas, then, if transmitted through the same system of pipes, the percentage of leakage, based on the amount of gas used by the consumers, would be increased about tenfold; or, if the percentage of leakage in a system had been five per cent. with ordinary gas, it would be about fifty per cent. with acetylene of the gas used by the consumers, or thirty-three per cent. of the gas stored in the holder.

The system of piping now in place for ordinary illuminating gas would not, therefore, be suitable for the transmission of acetylene gas. If special pipes were laid for the acetylene gas, they would be required to carry a less volume of gas for a given illumination, and could be made smaller; but it is probable that the care required to produce tight joints would make it just as expensive to lay them as to lay the pipes for ordinary illuminating gas.

Let us next consider the price calcium carbide must be sold at to take the place of kerosene in domestic lighting, where the gas is generated on the premises. Assume that the cost of labour to charge the gas generator and depreciation of the plant is equal to the cost of labour to fill and repair the oil lamps, then we have to compare the cost of the carbide with the cost of kerosene oil required to produce an equal illumination. It was found by my own experiments that to produce sixteen candle-power in an argand, or in a good flat-flame lamp, required about 0·022 gallons of oil per hour. At eight cents per gallon this would cost 0·18 cents. To produce sixteen candle power with acetylene requires 0·4 cubic feet of gas per hour, so that 0·4 cubic feet would have to be produced for 0·18 cents., or 10,000 cubic feet for $45. Hence the carbide would have to be purchased for $45 per ton to be as cheap, for equal illumination, as kerosene oil. As one pound of the compressed liquid acetylene produces about fourteen and a half cubic feet of gas, it would have to be sold for six and a half cents per pound to be as cheap for a given candle power of light as kerosene.

In some of the earlier literature on acetylene it was proposed to convert electric lighting plants into plants for the production of acetylene, and thus obtain economic results. This could not be done economically, for only about one-half as much light could be obtained from the acetylene as by using the electricity direct for incandescent lights. The results obtained at Spray show that two cubic feet of acetylene gas could be produced per hour per electrical horse power. This would furnish $2 \times 40 = 80$ candle power. If the electricity were used direct with incandescent lamps requiring four and a half watts per candle power, the light produced would be $746 \div 4·5 = 166$ candle power per electrical horse power, or about twice as great a light as would be produced by the acetylene, as has already been stated.

To be as cheap an illuminant as electricity, therefore, the carbide must be made at some point, say, a water power, where the cost of the power and attendance is much less than at the lighting station.

It has been shown that for an equal illumination the electric incandescent light costs twice as much as gas when the latter is burned in flat-flame burners. The incandescent electric light has, however, held its own against the gas light on account of its superior qualities, which are its brilliancy, cleanliness, and adaptability. The electric light is also preferable on account of the fact that it does not vitiate the atmosphere with carbonic acid gas, and that it produces a less heating effect than ordinary illuminating gas. It also eliminates the danger of asphyxiation through an accidental leakage of gas. That the incandescent electric light has held its own at a higher cost to the consumer for a given candle power is a proof that other elements enter into the problem of artificial lighting as strongly as the cost of a given amount of light. From this standpoint it may be argued that acetylene, producing as it does a more brilliant light than any now used for interior lighting, and having the quality of showing the complexion in life like tints, will have its own field, even should it be the most costly style of illumination.

Again, acetylene is now used in place of the calcium light for lantern projections, &c. Were it not for the explosive character of the compressed acetylene, it would be useful for cases of isolated lighting, such as for beacons and light buoys.

It has also been shown that the Welsbach lamp produces about three times the illumination for a given cost as ordinary illuminating gas burned in a flat-flame burner, but that it is deficient in showing the complexion in lifelike tints. For most classes of work this defect is not of great enough importance to outweigh the advantage derived from its great economy.

The whole situation may be summed up by saying that each system of lighting has its own field of usefulness, on account of properties peculiar to itself, which make it more desirable than the others for certain classes of work.

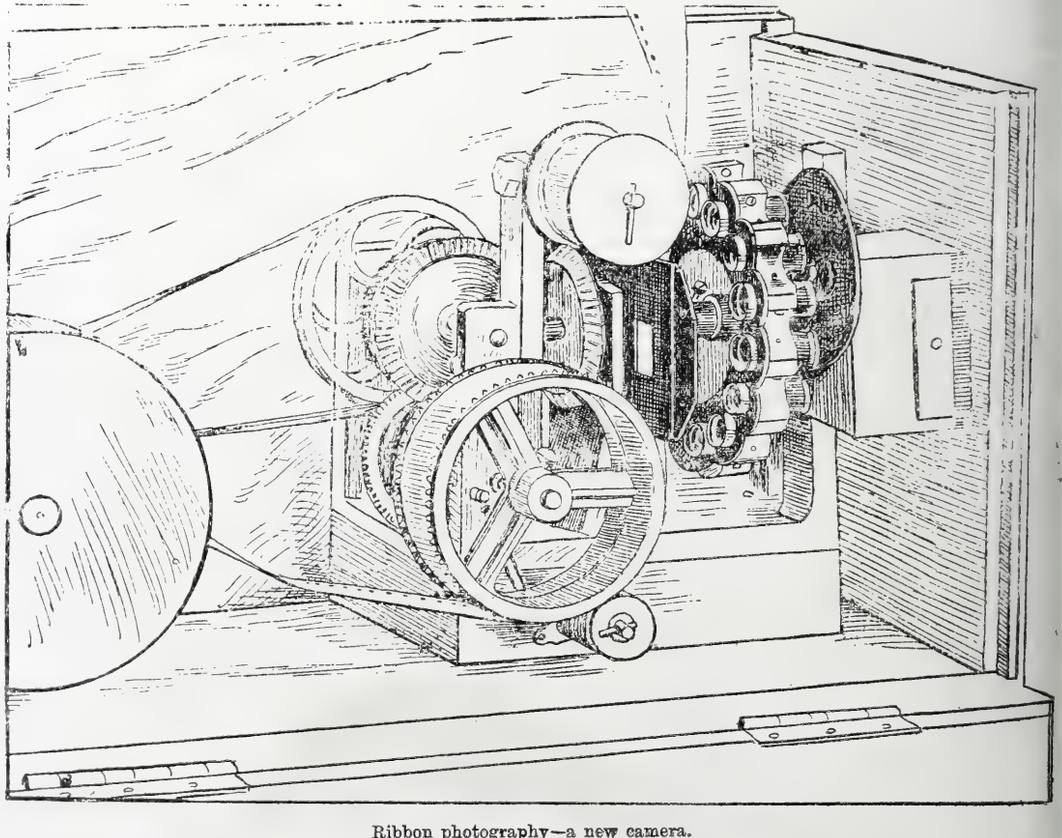
PROFESSOR D. S. JACOBUS.

A NOVEL CHRONO-PHOTOGRAPHIC CAMERA.

[The Scientific American.]

SINCE the introduction of ribbon photography, by means of which successive pictures are rapidly made of moving objects upon a long ribbon or strip of sensitised film, various devices have been invented, some complicated and others very simple, for the production of the pictures and the manipulation of the picture ribbon.

In the large engraving is illustrated quite a novel camera, the invention of G. Francis Jenkins, for making accurately the continuous series of pictures. Instead of using a rotary disc shutter with radia



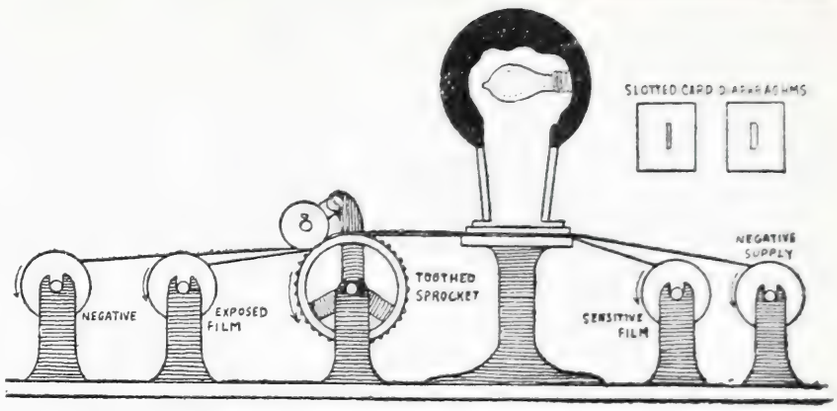
Ribbon photography—a new camera.

ertures and a fixed lens, this camera has a single opening the front, the size of the aperture being regulated at its ar end by a diaphragm disc having radial slots cut therein of rying widths. The operator is thereby enabled to govern the nount of light admitted to the lenses according to the subject be photographed and the length of exposure desired. This sc is rotated by hand on its axis like an ordinary stop in a ide-angle lens.

Back of the diaphragm disc is observed the battery of lenses, ch of the same focus, arranged in a circle, adjoining each her upon a rotating disc, the axis of which extends rearward, rminating in a bevel gear wheel, which meshes into a side vel gear wheel, fixed upon the upper shaft, suitably geared to ie main driving shaft. The main shaft may be operated by crank on the outside of the box, by hand or by any suitable otor like a spring. The sensitised celluloid perforated ribbon lm will be noticed passing downward near the front end of the mera in front of the exposure tension plate, the square perture in which is exactly in line with the front aperture in ie box. From this point the film, after exposure, passes ownward between the sprocket wheel and pressure roller to the winding el in the rear end of the camera, which is rotated by belt connexion a pulley on the upper shaft, and takes up the film ribbon as rapidly as is exposed. The feed roll for the supply of fresh film is not shown, but ay be located in the rear of the camera over the winding reel.

The operation may now be readily understood. To obtain successive ictures of a particular object, the camera is placed on a stand or tripod, he crank on the outside is then rotated, which causes the film to travel ownward continuously, with exactly the same speed that the lenses otate, so that, at every fraction of a second that it takes for each lens to ass behind the camera aperture, an impression of light is made on the ownwardly moving film, and, as they (the lenses and film) both move in nison, it follows that a sharp picture must be the result, while the rilliancy of the illumination is at its maximum. The camera can be arried about as readily as any other camera, and in practice it is found he motion of the hand-operated crank is sufficiently uniform to permit f the proper reproduction of motion by the positive pictures when rojected on the screen.

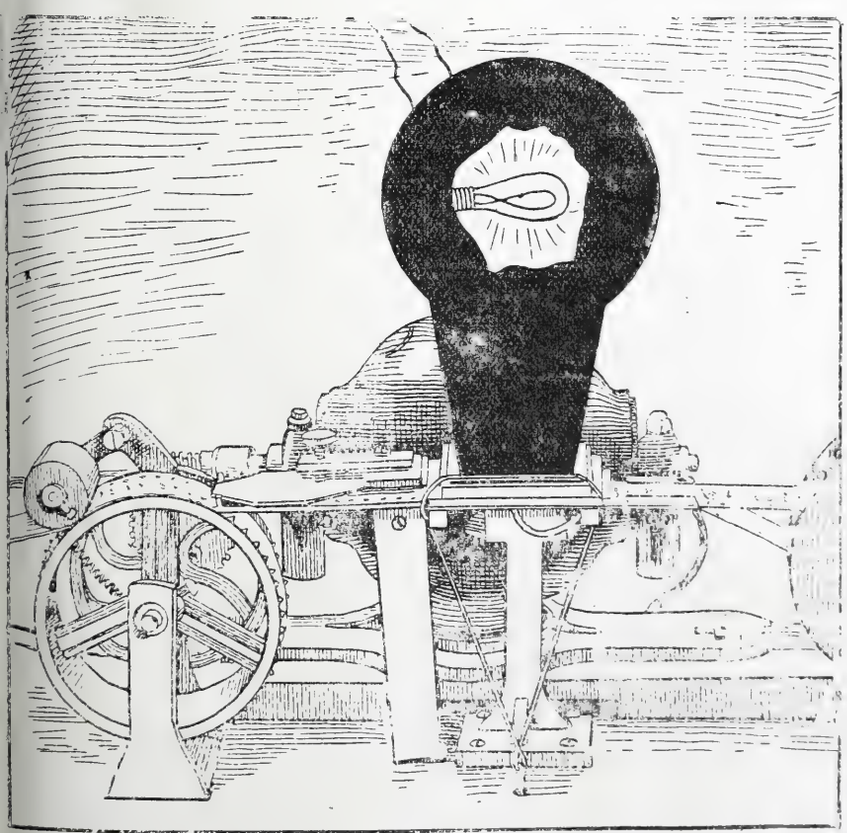
The other illustrations show the method of printing the positive ibbon pictures from the negative by means of artificial light, also lesigned by Mr. Jenkins. It consists of reels supported on suitable pright standards holding respectively the sensitive ribbon film and the egative film. The film from the negative supply reel is carried along ver the sensitive film reel, and both pass in contact, in continuous notion, under an exposing chamber illuminated by white light, either ncandescent electric light or a Welsbach gas light, thence over the oothed sprocket driving wheel to the winding reels, the exposed film being wound first. It will be noticed that the reels are interchangeable, hence to make duplicate copies it is only necessary to remove the negative spool from the winding-up end to the supply spool standard of the apparatus and begin over again. The perforations in the edges of the film are of specially square shape, and give the square sprocket teeth of the propelling pulley a better pull on the film. The teeth pass through the perforations of both films, causing both to move exactly the same, and at all times to keep in perfect register. The speed of the film passing under the exposing chamber must be uniform, and this is obtained by propelling the sprocket wheel by an electric motor or by a spring motor. The electric motor is seen behind the light chamber in the larger of the two engravings. The axle of the motor has worm gear operating a cog wheel on the main shaft. The V-shaped elastic band holds the frame (in which is a ground glass) in contact with the films, producing a sort of tension on the film. To the left of the light chamber is a supplementary tension, adjusted by screw nuts, as shown.



Ribbon photography—diagram of the printing device.

Referring to the diagram illustration will be seen two slotted diaphragm cards. These are placed over the ground glass just mentioned, at the bottom of the light chamber, and are for the purpose of regulating the amount of light that acts on the negative. If the negative film, as a whole, should be thin, then the card with the narrow slot is used, which allows a shorter exposure to be made, as the negative and film are passed under it. If the negative is full of density, then the narrow card is removed and the wider-slotted card substituted, which allows a larger volume of light to act upon the negative film. The exposed film is wound around large open reels from its spool, and developed by passing through troughs of developer solutions.

The necessity of providing apparatus to quickly reproduce positive impressions from the negative ribbon films is one of the reasons why this simple device was invented, and its novelty consists in the fact that the film moves continuously under a uniform source of light without any intermittent motion or the use of shutters. The operation of exposing the film is carried on in a room illuminated by the usual ruby red light.



Ribbon photography—exposing and printing apparatus.

ACETYLENE GAS FOR PORTRAITURE.

[The Professional Photographer.]

One of the most important improvements in artificial illuminant for the studio is the introduction of acetylene gas. So satisfactory is it that I am amazed at the slowness with which photographers, amateurs and professionals, have entered into experiment with the new gas. The spectral analysis of the lights shows identically the same colour as daylight; in fact, our English friends forcibly express their views by calling each half-foot acetylene burner a "chunk of daylight," and so it is. An installation of the light being so exceedingly cheap, it should be a necessary adjunct to every studio. Of course, the light, not having the speed of magnesium powder or daylight, cannot be used for children's or babies' portraits, when speed is the essence of the contract; but for ordinary exposures, large heads, and artistic portraiture, where lightning speed is not a necessity but an impediment, acetylene gas will be found to be a perfect illuminant, and so cheap that every photographer will find it quite within his means. The St. Catharine's Camera Club are, I think, the first people in Canada to put in a complete installation for photographic experiments, and they are more than pleased with the attending results. Through the kindness and generosity of Mr. Thomas L. Willson, the inventor of the gas, whose Canadian factory is located at St. Catharine's, and Mr. Wallace, of Wallace & Son, Hamilton (the maker of the only generator that has received Mr. Willson's endorsement as being perfectly safe), a perfect installation was put in the St. Catharine's

Camera Club studio about two months ago, and has been experimented with continuously since.

The outfit used by the St. Catharine's Club consists of a movable frame on castors, inside of which moves another smaller frame, similar to a window sash, which can be readily raised or lowered. Attached to this sash frame is a bunch of thirty lights, burning half a foot of gas per hour each. The piping is attached by flexible hose to the generator, which allows the light to be placed in any spot in the room and adjusted to any light desirable. With a rapid portrait lens, fully timed and beautifully lighted, negatives can be made in from two to three seconds' exposure.

J. T. Groves.

TO COLOUR WET-PLATE LANTERN SLIDES.

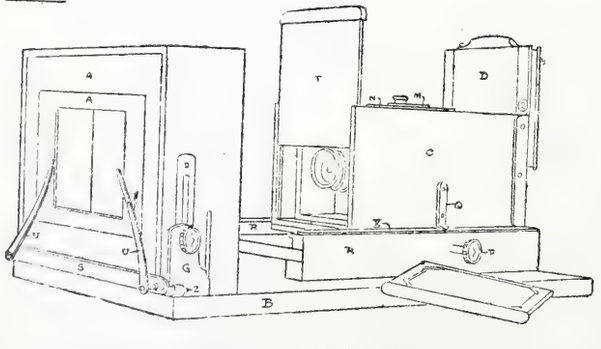
Mr. D. L. Elmendorf, whose very comprehensive work on lantern slides has made such a place for itself in photographic literature, says *Anthony's Bulletin*, in answering a query as to the proper treatment of wet-plate slides for colouring with his lantern-slide colours, gives the following advice: "Take forty grains of hard gelatine and soak in cold water until perfectly soft; then pour off all the water possible; add two fluid ounces of water to the gelatine, and place the vessel containing the gelatine and water in a saucepan full of water on the stove, bringing it to boiling point; then strain the dissolved gelatine through a cloth and flow over the wet-plate slide while hot; then place the slide on a level table to set and dry. Care should be exercised that no dust be allowed to get at the plates. This coating of gelatine on the surface of the wet plate will, when dry, form an excellent basis for colouring, and can be handled in all respects the same as a dry plate. It is best to have the plate full of gelatine solution, because, when dry, the film will be quite thin."

A COMBINED LANTERN-SLIDE REDUCING AND ENLARGING CAMERA FOR MAKING LANTERN SLIDES.

This camera is the invention of Dr. Roland Smith, and consists of (1) a baseboard, B, at one end of which are fixed the runners, R R, for the camera proper, C; and, at the other end, the frame, F, and stage, S, for the negative plate which is to be reduced or enlarged. (2) The camera proper, C, containing the dark slide, D, which holds the lantern plate, the lens, L, and a shutter, T. (3) The frame, F, with adapters, A A, for various-sized negatives, and an adjustable stage, S, for holding these plates against the adapters in any position. (See fig. 1.)

(1) The baseboard, B, is provided with runners, R R, fixed lengthwise, on which the camera proper, C, slides, actuated by the ordinary rack and

FIG. 1.—



pinion, P, and these runners are provided with graduated scales, X X, on which pointers, Q Q, fixed to the camera proper, slide; on one side the scale and pointer being graduated for reducing various sizes from, say, whole-plate ($8\frac{1}{2} \times 6\frac{1}{2}$ inches) to lantern size ($3\frac{1}{4} \times 3\frac{1}{4}$ inches), and on the other side for enlarging from any smaller sized negative to lantern size. These pointers and scales are so arranged as to indicate the correct distance of the lens, L, from the negative plate. At the other end of the baseboard, B, the frame, F, and stage, S, for holding the negative plate, are fixed at right angles to the runners, R. (See fig. 1.)

(2) The camera proper, C, consists of an ordinary box camera, provided with a dark slide, D, to hold the sensitive lantern plate from which the lantern slide is made, at the end of the camera, C, opposite the frame, F.

Inside the camera, C, is a suitable lens, L (fig. 5), fixed in a sliding light-tight partition, and provided with a pointer, M (figs. 4 and 5), which slides on a graduated scale, N (figs. 4 and 5), fixed on top of the camera proper. On the under side of the pointer, M, a projecting pin passes through a slot in the camera, and engages with the light-tight partition holding the lens. A thumb screw, W, passes through the pointer and clamps the lens in position.

One of the graduated scales, N, is marked, showing the distances of the lens from the dark slide when reducing.

For enlarging, the screw, W, is removed, the pointer, M, is reversed end for end, the lens is pushed forwards towards the frame, F (fig. 1), and the pointer replaced, but now pointing over the second scale, N N (fig. 4), for enlarging.

A shutter, E (fig. 1), is provided in the camera, at the end opposite the dark slide, T, to shut off the light as required.

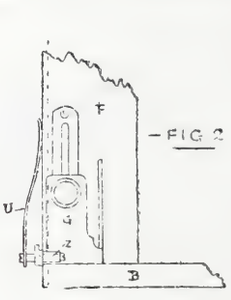


FIG. 2

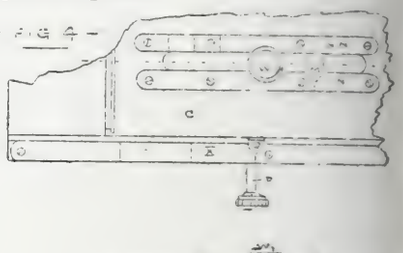


FIG. 4

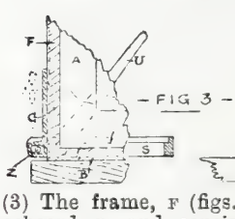


FIG. 3

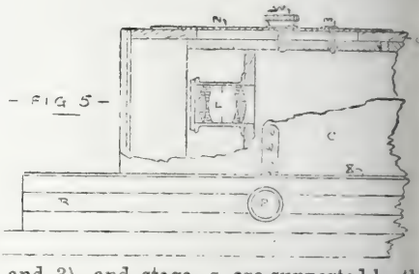


FIG. 5

(3) The frame, F (figs. 2 and 3), and stage, S, are supported by the baseboard, B, and consist of an oblong frame of two sides, top and bottom, the opening (about $8\frac{1}{2} \times 6\frac{1}{2}$ inches for whole-plate size) facing the camera proper, C (fig. 1), and on the side opposite the camera, C, this frame, F, is rebated to take the largest plate or ordinary adapters, A A (fig. 1), for half-plate, quarter-plate, or such other sizes as desired.

The stage, S (figs. 2 and 4), consists of a rebated bar placed on the outside of the frame, F, on the side farthest from the lens, L (fig. 1), and is held to the frame, F, by two slotted guides, G (figs. 2 and 3), sliding on the sides of the frame which are held in position by thumb screws.

These guides, G (figs. 3 and 3), have each a horizontal slot to take projecting pins, Z, on the rebated bar so as to allow the pins, Z, to revolve in the slots when one guide is raised higher than the other, and the negative plate tilted, and also to allow the pins, Z (figs. 2 and 3) side play in the direction of the length of the bar.

The rebated bar, S, is held against the frame and the adapters by the guides, G, and is furnished with two curved springs, U U, which reach over any of the adapters, and hold the negative plate against them, and also hold the adapters in place.

The lower edge of the negative plate is placed in the rebate of the bar S, which is open at the ends so that the negative plate may be moved along the bar as required, the plate being raised, lowered, or tilted by the movement of the bar, S, and guides, G, which are then clamped fast as required.

THE ILLUSTRATED LECTURE.

Few persons viewing with interest the illustrations as portrayed by the modern stereopticon have any conception of the intricate details that have been carefully studied and mastered to make the exhibit a success. The lecturer is the one on the anxious bench, says *The Exhibitor* (Philadelphia), for he probably knows by sad experience that he is entirely at the mercy of the silent man at the other end of the hall.

His bouts with the janitor or counter opinions with some manager on the entertainment are fleeting troubles as compared with what will overwhelm him if the operator is a novice or gets flurried. The operator, too, is somewhat at the mercy of the lecturer.

All lecturers have their slides in order as a matter of course—yes, we know that to our sadness; many lecturers get an after-idea as to sequence and change according to the last notion, and the consequence frequently is that they disarrange, or probably forget the changes, and the result is a picture appears at an unexpected time. When this happens, the operator is all at sea; all he can do is to present the pictures in the order that he finds them, and trust to the lecturer's skill to get them both out of the dilemma; neither should allow himself to get angry at the trouble or else further complications may follow.

Pictures necessarily must be in order, and it is requisite for complete success that they be distinctly and uniformly tagged; the tag should be placed on the lower left-hand corner of the right side of the slide, the right side being the one you look upon that presents the view as it is seen be it a landscape, building, copy of a painting or engraving.

Lecturers have as many different ways of arranging their slides as there are individuals in the profession. When the slides are of different styles of mountings, the operator must have his wits about him. A row of plain slides, not mounted in wooden frames, with strips of paper interspersed here and there, will be the plague of the operator, who carelessly lets one of the strips fall below unobserved, and to his dismay he will hear from the other end of the line "That is not next, Mr. Silent."

Then the box without grooves, that contains a lot of slides closely packed, is a snare that our pupil must beware of; if they are not inclined

backward, they will likely fall forward, and, if inclined backward, the front ones will slip forward, the bottom ends advancing first, and an inexperienced operator will pick them up so as to reverse the order of those that fell. The bottoms of such boxes should have a piece of cloth pasted upon them for the slides to rest upon, then they would not slip.

A row of unmounted slides of unequal lengths, some of the English size, square, and some of the American a quarter of an inch longer, are almost sure to catch the operator, he will probably pass two or three of the shorter ones in a lot of a hundred, especially if they are placed in grooved boxes with pasteboard partitions, and his happiness is gone for that evening.

Slides with mechanical movements are at all times difficult to manage, and require practice to make them effective.

The lecturer, if he has confidence in his operator, can throw care away and devote his attention to presenting his subject in the most attractive manner; he can center his efforts entirely upon each phase of the subject as he glides smoothly along.

The operator has care on his shoulders from the beginning to the end, care that he gets the slides in right, that he preserves the order, care that they are focussed nicely, care that his lights are working well, that the gases are in the right proportion, that the limes are turned frequently, that they do not split and fall out, leaving all in total darkness, care that he does not miss the signal for the next; in fact he must be calm and alert and have a thorough knowledge of his instrument, he must know all its peculiarities, for no two stereopticons are exactly alike.

Now, you must not suppose that this is all the operator has done to make your evening glide along smoothly; if he is an expert he will think these various cares of no account, because he has become accustomed to them, and, in fact, gets to enjoy them; he may have a little nervous twitch at the start, but that soon passes off as he gets warmed up to the work, and sails along nicely, until, when he least expects it, he hears that awful "That is not the next;" then he gets warmer very suddenly.

His cares before the evening are the greatest. Do you see that screen? it looks tight and smooth, just held up by two poles and some ropes; that is easily done, is your thought, if you think about it at all; but, if you had seen the operator and an assistant struggling for two hours and perhaps more to get it so, you would realise the value and force of every operator's assertion that "putting up the screen" is the most trying part of the exhibition; and, Mr. Operator, beware of the result when the interested parties want you to so arrange the screen that it can be let down after some other portion of the programme that precedes the lantern exhibit. To adjust a screen as it should be done requires time, and that is not always granted under such circumstances.

Among the cares that will vex the operator he will find the signal not one to be despised; the antiquated "English selfish signal" as we term it, the one that supposes that the operator has nothing to do but look at the lecturer, the one with the red signal on the reading lamp, we are glad to say has not found favour with the American operator. He inclines towards the Electrical Buzzer or Tapper; but this, like all else in the world, is not an unmixed blessing. If it is run with an acid battery, there is the annoyance of the acid; if with the dry battery, there is the uncertainty. Dry batteries have a will of their own, and will stop so suddenly and at so unexpected a moment as to quite shock the operator—not an electric shock, but one that will make him wish himself a hundred miles away. A reserve dry battery should always be at hand. Care should be shown in placing the wire so that it will be out of reach of the small or large boy who may be tempted to run a pin into the strands and short-circuit the current.

And on the line of this innocent-looking signal comes possibly the most trying annoyance to which the operator is a martyr. A push button in the hands of a nervous lecturer is a terror; when he pushes, he pushes and pushes, one would think he was trying to drive the button through the whole length of the wire. Some one says that it should not be a buzzer or clapper, but make only one clap—that is right as far as it goes, but suppose the operator should not hear that one, then what? Suppose the operator is not just looking at that English red signal, then what? No, the operator has his hands, eyes, and mind fully occupied, his other senses should be hampered as little as possible; the signal should be adjusted so as to make little noise, so as not to annoy the audience.

Focussing is a knack that requires a steady hand, so as not to shake the picture, keen eye-sight and a discriminating judgment in order to focus instantly the most prominent portion of the picture. The operator must be so familiar with his instrument that he intuitively turns the rack adjustment backward or forward for thinner or thicker slides; this should be done while dissolving, if not before; the receding and advancing of the picture on the screen in the effort to focus the picture is very trying on the eyes of the audience, and should be avoided.

"Please sharpen that picture" strikes harshly upon the attentive audience, and should be uncalled for as far as the efforts of the operator can prevent it; it is more frequently heard from that lecturer who "has taken his own pictures," and the likely fact is that the picture never was in focus.

These two, the lecturer at the one end and the "should be silent" man at the other, are mutually dependent upon each other, and should, and do, as far as our experience goes, have a feeling for the trials of each in their mutual effort to please an audience.

WRENCH'S IMPROVEMENTS IN CAMERAS AND OPTICAL LANTERNS.

This invention has for its object to provide improved means whereby the line passing through the axis of the lens shall always pass through the centre of the plate or slide, notwithstanding that the plane of the lens is placed more or less at an angle to the plane of the object being photographed, or the screen or to the plane of the sensitive plate or transparency, thereby obviating the distortion of the image or picture.

Mr. Wrench claims that the employment of the ordinary swing-back adjustment of cameras is thus rendered unnecessary.

Fig. 1 is a sectional side elevation of a hand camera provided with the improvements, the mount for the lens being arranged to move upon a cylindrical surface.

Fig. 2 is a sectional plan, the section being taken on the line 2—2 fig. 1.

Fig 1

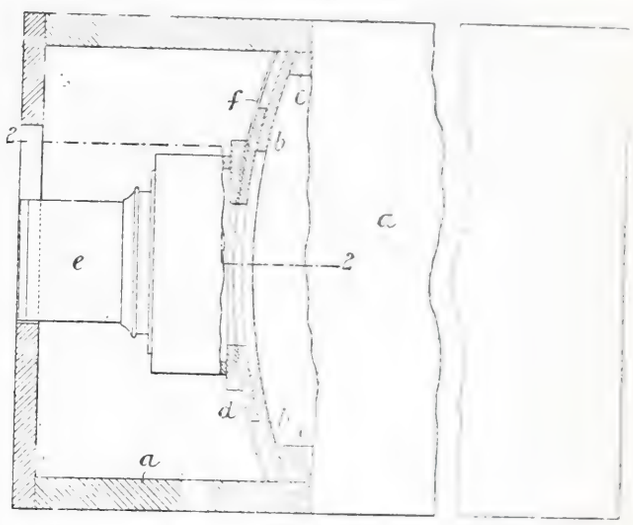


Fig 2

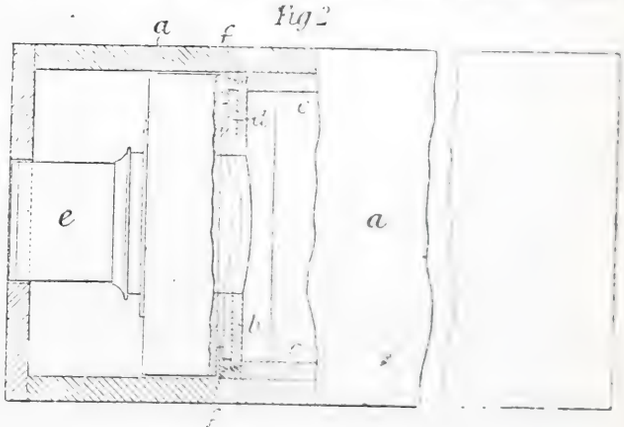


Fig. 3 is a front elevation of a mount moving on a spherical surface.

Fig. 4 is a vertical section of the same.

Fig. 5 is an elevation of a modified form of spherical mount.

Fig. 6 is a central section of the same.

In the arrangement of the invention, shown in figs. 1 and 2, *a* is the camera box, and *b* is the front wall of a slide, *c*, arranged within the said box and adapted to be adjusted slightly for focussing purposes, the outer face of the said wall being curved to the arc of a circle which, when the said slide, *c*, is at, say, the central point of its adjustment, will have its centre at the centre of the sensitive plate which the camera is designed to receive. *d* is the sliding front for carrying the lens, *e*, and other parts, the said sliding front having that surface which is in contact with the front, *b*, curved to the same circle as the said front, so that the former can slide upon the latter. *f*, *f*, are guide strips fixed to the front, *b*, and serving to hold the movable front, *d*, in position upon the said front, *b*.

With this arrangement it will be understood that the axis of the lens, *e*, will always be upon a line radiating from the centre of the plate, except when the slide, *c*, is moved for focussing purposes in which case the axis of the lens might intersect the plate slightly above or below the centre of the same. In cases where the focussing adjustment is in the lens itself, so that the position of the sliding front relatively with the sensitive plate remains unalterable, it will be obvious that the axis of the lens will always intersect the sensitive plate at the centre.

In figs. 3 and 4, which illustrate the arrangement of a spherical mount,

g is a ring for carrying the lens, the said ring being formed upon or attached to a plate, *h*, which is the segment of a sphere. This plate, *h*, is adapted to slide between two other plates, *i*, *i*, which are also segments of spheres, and form part of a ring, *j*, designed to be secured to the front of a camera, the outer of the said plates carry a pressure ring, i^1, for bearing upon the plate, *h*.

The arrangement shown in figs. 5 and 6 does not differ essentially from that shown in figs. 3 and 4, the main difference is that the plate, *h*, which carries the lens, instead of sliding between two plates, *i*, *i*, slides upon a single plate, *i*, screws, *k*, *k*, attached to the plate, *i*, passing

Fig 3

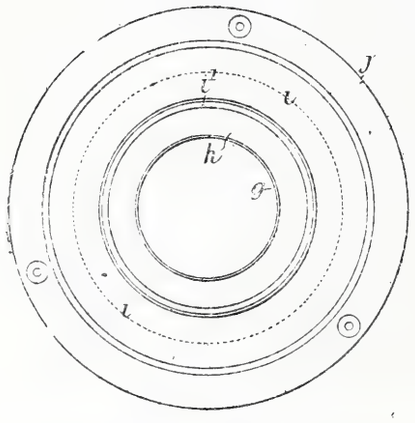


Fig 4



Fig 5

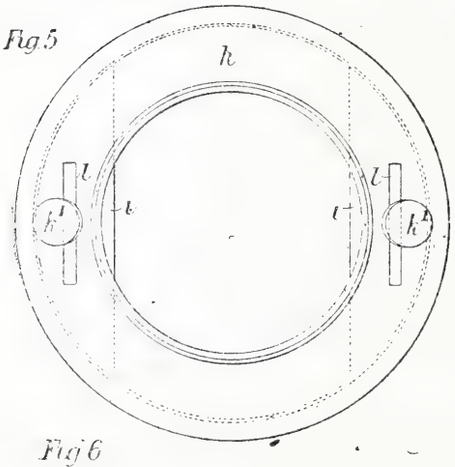
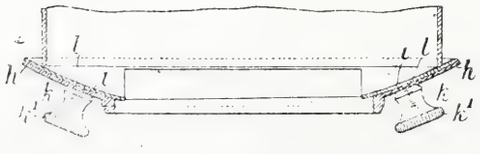


Fig 6



through slots, *l*, *l*, in the plate, *h*, and being provided with nuts, k^1, k^1, for fixing the said plate, *h*, in any desired position. As shown, the slots, *l*, *l*, only permit of a movement of the mount corresponding with that of the cylindrical arrangement hereinbefore described, but it will be obvious that the slots may be formed to permit of movement in any direction. The modification last described is specially adapted for optical lanterns, but it is to be understood that the other arrangements described can also be used with optical lanterns.

Mr. Wrench concludes: "When I use my invention in combination with an optical lantern, I find it advisable to use a single lens, or other suitable combination of lenses, instead of the usual quarter-plate lens, in order to obtain sharp definition over the whole of the illuminated area."

Acetylene for Use on Board Ships.—At a recent meeting of the Institution of Naval Architects, Professor Vivian B. Lewes read a paper on "Acetylene Gas and its Probable Future Afloat." Having briefly described the discovery and properties of commercial calcic carbide and acetylene, Professor Lewes proceeded to discuss methods by which the latter might be applied on board ship. He said that the possibility of liquefying acetylene at pressures about those at which liquid carbon dioxide was produced, largely enabled considerable volumes of the gas to be compressed in the liquid state in small wrought-iron or steel cylinders, and that it was in this liquefied condition that the gas would have to be utilised on board ship. At the freezing point, liquid acetylene would give about 370 times its own volume of gas. The pressure which liquid acetylene exerted upon the cylinders containing it varied with the temperature, but for all ordinary degrees of heat—say, from 60° to 75° Fahr.—the pressure would be from 600 lb. to 700 lb. on the square inch, whilst, when heated to 98° Fahr. the pressure rose to 1020 lb. The cylinders, however were generally tested to two or three times this pressure, so that there was an ample margin of safety.

Dealing with the important subject of the danger attending the use of acetylene, Professor Lewes went on to state that during the past two years there had been two or three explosions caused by cylinders of liquefied acetylene, and these had given rise to a feeling that acetylene in this form was not safe; but it must be remembered that the introduction of a compound of this description, with comparatively unknown properties, must for a considerable period be hampered by accidents caused by improper usage; and there was proof that in each of the accidents that had occurred the screw plugs closing the cylinders were being tightened up with undue violence. The author pointed out that the factor of danger in liquid acetylene, and also in the compressed gas, was that acetylene was an endothermic compound, *i.e.*, a compound in the formation of which heat is absorbed, instead of, as is usually the case, being liberated, and with such compounds this heat was again set free when they underwent decomposition, and added considerably to the violence of the action. At any pressure up to two atmospheres acetylene was perfectly safe from any explosive action *per se*, as at these low pressures high temperature, or even the detonation of a charge of mercuric fulminate in the gas, only caused local decomposition, and the explosion did not travel for more than a few inches from the spot where it was started.

Directly, however, the gas was put under more than two atmospheres pressure a red heat would initiate explosion through the whole volume, this being due to the sudden resolution of the acetylene into its constituent elements, carbon and hydrogen, with the liberation of the endothermic heat stored up in it. This all sounded very alarming; but, when the conditions of danger were realised, it was at once evident that with rational treatment cylinders of liquid acetylene were for all practical purposes perfectly safe, as, when kept in water tanks, nothing short of the surroundings being on fire would give the requisite temperature to cause danger, and on board a vessel the cylinders could easily be dropped overboard on a line until such danger had passed.

When it was considered that a cylinder holding one cubic foot of the liquefied gas would supply a burner giving a light of thirty-two candles for 400 hours, it was evident that there were great possibilities for it in the future on ships and yachts not fitted with the electric light. With a proper and special arrangement highly efficient gas engines could be driven by it, and in small atmospheric burners it gave a flame of very high temperature; so that it was by no means impossible that the twentieth century might see a high-speed torpedo boat driven by an acetylene engine, with an acetylene searchlight and an acetylene cooking stove, whilst some might even add to the equipment an acetylene torpedo, as a most effective Sprengel explosive might be made from liquid acetylene and chlorate of potash. These were dreams of the future, but there were certain spheres of utility ready for acetylene in which no plea of danger could be urged against its adoption.

The first of these spheres in which acetylene could be usefully employed was floating buoys. The author drew attention to the fact that at the present time there were four methods by which these buoys could be lighted:—(1) Electricity; (2) compressed oil gas; (3) compressed coal gas enriched by gasoline; (4) Wigham's oil lamps. With electricity the chance of the conducting wires being fouled by an anchor or dredge always existed; the compressed oil gas needed a small gasworks and compressing plant; compressed coal gas and gasoline enrichment demanded the latter if not the former; whilst Mr. Wigham's oil lamps stood out as being both good and economical. There was room, however, for acetylene for this purpose, and a cylinder of liquid acetylene having a capacity of 1·75 cubic feet, fitted with a reducing valve, and stored in the bottom of the buoy, would give a clear white light of thirty-two candles for one month, and in cost would even now be about equal to compressed oil gas giving the same amount of light.

Among recent "improvements" in optical projection apparatus is that of Mr. T. Haegele, whose invention consists of "an apparatus designed for the production and projection of images from flat opaque objects, such as photographs, drawings, autographs, paintings, printed matter, and all like objects of a solid nature having shape and form, such as a watch in action, or any mechanical object. Objects of nature, such as insects and flowers, can be magnified and projected on a screen showing at the same time everything in its natural colour. He makes of wood, iron, tin, or other suitable material, an oblong box, and places inside, at one end of the box, one, two, or more lights, so that the object to be projected is illuminated by them. The lights are so placed that the image of the object to be projected can pass between them without obstruction through a diaphragm or hole arranged in the middle portion of the box, and subsequently through a suitable lens, which is brought into a sharp focus, and projects the image on or through a suitable screen of any desired size."

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*July* 2, 1897.

THE LANTERN RECORD.

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LANTERN MEMS.

JUBILATING and snap-shotting have been the order of the day since the decorations have been completed in honour of the Queen's Diamond Jubilee, for young men and old men, ladies of all ages, and children, have all been "touching a button" or doing more serious work. America is credited with being go-ahead, and, when the advanced party is represented by a boy only seven years of age armed with a camera and credited with doing fairly good work, one can only wonder how soon it may be necessary to design a camera for the infant. The run on plates and films has been enormous, and as regards daylight changing cartridges they could not be obtained on the day after Commemoration Day for love or money, at least in the central part of London.

* * * * *

A NUMBER of cinematograph cameras were in use on the memorable June 22, some to take the films of the ordinary length, say, of seventy-five feet, while others were provided with spools and phenomenally long film, running, if I am correctly informed, to more than 1000 feet; but of the results of one apparatus, at least, I can speak with certainty, for, within forty-eight hours of the procession, I was favoured with prints and transparencies of a portion of an exposed film 180 feet long, and the results which lie before me must be gratifying to Mr. A. Langfier, the Managing Director of the Velograph Syndicate, who was responsible for the work, and succeeded so well at the Grand Stand outside Charing Cross Railway Station.

* * * * *

I KNOW that Mr. Birt Acres, Mr. Lumière, Mr. Paul, and the maker of the portable cinematograph, were all out with their respective cameras for taking animated photographs, and probably the "biograph" and a dozen other "graphs" as well. It is to be hoped that they were all as successful from the particular point of view they chose, or could obtain, as those I have alluded to, and will be able to show the public the results shortly. The value of this class of apparatus is at once apparent when one has practical proof of its utility by seeing permanent records of an historical event, also a pageant delineated and apparently given life, the whole of such a nature that it is unique in the history of our nation, and probably of any other.

PHOTOGRAPHIC enthusiasts were in evidence, using cameras as large as 12×10 or a hand camera, and others with a professional status were seriously "on business." One gentleman well known in the lantern world was seen walking down the line of route, armed with what were apparently *four cameras*, one slung over each shoulder, and one in each hand; but, as he would probably want two hands for his snap-shotting operations, I think we may deduct one and say three. His artistic tendencies are well known, and his ability for getting a number of good negatives in a little time is his passport; but, while I have often seen him fully equipped with martial accoutrements, I have never seen him before so completely prepared for "taking positions."

* * * * *

THE services of quite a number of photographic artists were retained for the papers, both illustrated and otherwise, and within the next week or so some fine results will be seen published. The weather was, as everybody knows, "Queen's weather," and those who were fortunate to get positions had well-lighted subjects with good contrasts, for "King Sol" came out just in time for the royal procession to be photographed.

* * * * *

I AM pleased to see that representative men of science have been included in the list of Jubilee honours. Professor William Crookes is to be Sir William; Dr. Huggins, F.R.S., and Professor Norman Lockyer are also to be knights. The important part played by the discoveries and investigations of Professor Crookes in high vacuum tubes, as used now in X-ray photographic work, and the value of the labours of the other two investigators in connexion with the spectroscope and spectrum analysis, is thus acknowledged as it should be, for they, like Baron Röntgen, have given their results freely to the world, and enabled others to experiment and tread in the same path, or diverge from it, for the advancement of knowledge and development of our resources.

* * * * *

THE latest radiograph is that of a hand showing all the blood vessels, a truly wonderful result. The fact that a society has been founded by Professor Sylvanus Thompson for the study of the Röntgen rays and kindred phenomena, and that its members are to include photographers, should give further interest in this fascinating and useful study, the possibilities in the future being immense, judging by the success obtained during the one short year the subject has been before the public. It only shows, when a number of experimentalists set to work earnestly, what marvellous progress is made in a comparatively short space of time.

G. R. BAKER.

THE PSYCHOLOGICAL SNAP-SHOT.

LET not the intending reader be deterred by the abstruse and long-winded-looking title from proceeding further; it has nothing of Thibet about it, no Mahatma has pressed the bulb, nor is there a vague and misty spirit form to be shown as a result. On the other hand, the essential key-note will be that of the ordinary and commonplace, and sorry only am I that

I can think of no simpler form of title which would naturally and legitimately include that which is to appear under it. But to the point and proof.

With warmer days and improving light as inducements to go abroad with the camera, the season of snap-shotting, nearing apace, will soon be in full swing with us, only to result probably, as many before have, in the thinnest of good results, a conscience-stirring heap of spoilt plates, and the decided conviction that all is not as it should be, either with the operator himself, or the art and practice of photography he has so lightly taken up.

If this state of things could be in any degree remedied, I think it would be a great gain, for the hand camera markedly lends itself to the use and enjoyment of a large class of people in need of a hobby, who, sensitive and shy, do not care for the more public advertising gained in carrying so distinctive an item as a tripod, and who do not, either, possess the requisite assurance for its rigging up, and the steady, complicated working of the camera fixed upon it, in anything of a public spot. This type of retiring individual, too, owing to his finer fibre, is, I think, more capable of higher work than his equally estimable but more roughly moulded brother, who, rigging up his apparatus anywhere, goes calmly on with levelling, composing, focussing, and exposing, untroubled by any shade of nervousness, and unstirred by anything in the way of lookers on and their remarks—curious, playful, or sarcastic—upon his proceedings or anticipated results.

There is no need of instituting a comparison between the two styles, that of the hand and the fixed camera, to try and find out which is the better; each has its own proper field, upon which it would be foolish upon the part of the other to trespass, and each also its long list of distinguished and able advocates.

Although the following will, in a lesser degree, apply also to the fixed camera and time exposure, we are more particularly now concerned with the hand camera; and with such, why, may I ask, is the small proportion of successful results, upon the whole, so unsatisfactory?

That the measure of success, as compared with the amount of attempt, should be small is, I think, easy to understand, bearing in mind the character of the objects taken—as a rule in motion—and the conditions under which the work, in being suddenly presented, is done; but, allowing for all this, admitting a low proportion of success to be inevitable, if you please, why should that proportion itself be of so unsatisfactory a character? Why is it so rare a thing to find a critical face brighten immediately upon looking at an instantaneous photograph, and keep on brightening the more the picture is looked into? (By the way, how few pictures of any kind there are, which compel, and will bear, this looking *into*, and not looking *at*.)

There can be no fault found, I take it, with a good hand camera of to-day; the special aptitude and skill necessary for getting the most out of it is not by any means uncommon, and the necessary conditions in the way of light and favourable opportunity are often all that could be wished for.

The unsatisfactory result, then, must be due to some ultra-photographic reason, and I hold it to lie in the war between the photographer's soul and the possibilities of the camera. Take a case to illustrate the point.

The photographer present at a horse race, his soul looking out of its window, the eye, very much stirred up by the excitement, in particular the taking of the stiffest hurdle, determines to take away a picture as a memento. He succeeds in doing so. The best horse, and his favourite, is in the act of going over. The picture is all that can be reasonably expected from a technical point of view; he has done his part correctly; the objects are properly placed upon the plate, everything is square, the exposure has been truly judged, there is a reasonable amount of detail. Still, though photographically satisfied, his soul pines for more; so do those of the friends to whom he shows his finished print, and who express their pining, often to his disgust, by sending it along the wrong channels in criticising the photograph, which is all right as such.

What they miss, in common with the one who did the work, is nothing photographic, but human—the sense of motion and exhilaration, the contagious enthusiasm of the crowd, all emphasised by the fresh air, green turf, and sparkling sunshine of the heath upon which the racing took place, and which they unconsciously call up when shown the picture, and associate with it. The human eye, in its picture, had a highly complex, impressible soul behind, to carry a record of what went on in front of it; the mechanical eye of the camera, although optically more perfect, simply a prepared plate. The latter certainly gave the more correct registration, but that makes no difference, it is the other, the more fallible one, we carry about with us; and it was the warring between the two compared impressions of the two that undoubtedly gave rise to dissatisfaction. There is probably something ungainly about horse or rider, or the combination; it must be correct though, that is, correct in the two-hundredth of a second which it took to impress them upon the sensitive plate by means of the lens. But the eye did its work far more leisurely, forming, indeed, a mean ultimate out of several images, and that falling upon a very different and far more plastic medium for retention. The people around, again, the camera lost, and their full truth, owing to the restriction imposed by its purely mechanical iris diaphragm—not so sensibly adjustable a one as that of the eye, by a great deal—the result being made evident in slightly blurred faces and general misty indistinctness of surroundings.

So it logically follows, apparently, that the more perfect, optically and geometrically, the lens, and the more rapid the plate, the further we are from a remedy. Has it not often been remarked, with surprise, what excellent work has been turned out with simple forms of lenses and cameras without the latest improvements—due in a degree, I think, to those facts? Still the gospel preached is not that of a return to cruder and rougher forms of tools, but that of thoroughly subordinating the best possible ones to the accomplishment of a conceived idea. The tendency is, to subordinate ourselves rather to the tools, get as much as we possibly can out of the camera and lens, in all directions at the same time, without a thought as to whether that be the natural—and, as seen by the eye itself, surely the best—style of treatment.

Opticians might, conceivably, construct a lens closely approximating to the power and definition of an average eye, to work under similar conditions, and a mechanical genius evolve a more satisfactory form of diaphragm; but, if this were practicable, and accomplished, we would still be very far from half way, for where is the maker who could sensitise his emulsion with soul? And, if possible again, souls being so different, how standardise makes and qualities? A bishop would have nothing to do with the horsey brand, more than a bookmaker with the theological; "Dives" would reject the "Lazarus" plates, and the fishing party the extra-rapid teetotal. But, leaving the problematical, let us return to a more practical solution. I think it must lie with the worker knowing what he likes and wants, and ever bearing in mind the special producing power and limits of his camera, taking greatest, vigilant care in not bringing the two into conflict, or into as little marked conflict as possible, for perfect accord, followed by perfect satisfaction, will not be attained, probably, until we do our photographing in the Elysian groves.

Admittedly a difficult task, undoubtedly an impossible one in many cases, but the recognising this in such, so far from being a drawback, will prove to be a gain; some things are unphotographable from our present point of view, and it is far better, and, in the end, more satisfactory, not to have exposed a plate at all, upon principle, than to have fired off half a dozen shots at hap-hazard, in the hope of hitting something; for if, by chance, anything good be hit, as a rule it is only to make a soul-depressing, ghastly, wounded mess of it.

How is it to be done? A good deal can be gained by studying acknowledged successes of first-rate men, more by getting into the habit of thinking for oneself. There is no reason why the two cannot be combined; but I would trust, primarily, to private thinking, for in that direction lies expression of individuality, as opposed to conscious or unconscious imitation; and, furthermore, it will be a most agreeable surprise to find out what a great amount of pleasure there is in the work, and how much fuller and more enjoyable a photographic tramp, with a definitely occupied mind, will prove to be than one with an unoccupied and listless mind.

To apply the principle: In the case quoted, for instance, of the horse leap, instead of taking the horse in the act of jumping, supposing it were taken at the brief moment of rest upon alighting, or in that of gathering himself for the leap. Instead of the largest working aperture, and an exposure of $\frac{1}{200}$ of a second, we might then use a smaller stop (which would give distinct on-looking faces) and lengthen the exposure to possibly, $\frac{1}{60}$ or even $\frac{1}{15}$ of a second. Entitled *A Successful Negotiation* say, or *The Crowning Test*, the mind would find it a more pleasing picture than the other, in that it would conform more closely with the type of one the eye took at the same time. We certainly would not have the horse and rider in the act of going over, but do we want it? I think not, for, apart from every other consideration, the mind much prefers a suggestion, which it can carry out itself to its own conclusion—to a presented picture in full detail. Is not this, indeed, the secret of an imperfect, scrappy sketch, oftentimes giving more pleasure than a mechanically perfect photograph, full of fine detail? How tedious, again, the fully elaborated argument in the sermon, and, apart from a question of time, how agreeable, on the other hand, the simple suggestion which leads the listener's mind into doing its own thinking, in its own particular way, along, merely pointed out, fresh direction. So with the horse, the mind would be eagerly ready, and delightedly pleased, to fill in all details itself, all that is wanted is the true suggested manner and direction. The growing sense of unreality, in looking at the sudden arrest of violent motion in mid-air, too, happily absent in the second picture, is a feature that it would be well to keep out of all that are intended—proof of excellence and soul-satisfaction—to be looked at long and frequently. As proof of this, in a lesser degree than that of a horse jump, I may mention the following instance: I have an engraving, upon my drawing-room wall, of a, to me, most pleasing, bar one item, little scene. It depicts, very faithfully, a rude country cart in a field, with a young lad standing in it, leaning against the side rail, forgetful of his light labours, as a driver of the harnessed ox, in the sweet, serious nothings he is evidently expressing to the lass, of about the same age and cut, sitting at the back, with legs and feet hanging free. It gave me great satisfaction to look at, partly, I suppose, because I have been, psychologically, in the boy's position, partly because of the sweet air of Arcadian calm and peaceful rest about the whole. This satisfaction, at first, was unqualified; now it is, to a degree, qualified and spoilt by the

pparently trivial fact, that the artist has chosen to show the ox, with urled tail, in the act of flicking off a fly. I wish he hadn't, for my ttention, however much constrained to miss the fact, will persist in ltimately wandering to this one weak point. Eleven years I have had , and looked at it too long a time, even for the "patient ox" to knock fly off in. "I wish he would drop it." "Drop what?" said my wife, ollowing my glance to the picture. "His tail," I answered. "Nonense," was the reply; "it's that second bottle of stout you took with inner." It wasn't; but, being a married man of many years' standing, let it go, of course, without dispute. The artist, to have made that icture perfect to me, should have let the tail hang, or have simply sugested possible motion, as he, doubtless, could have done, in half a dozen lifferent ways.

Special lines of snap-shotting there undoubtedly are, where more of ody than soul is required, and where a physical sort of appeal would be nore readily appreciated by the people who do the looking and judging; he "converted try" or "shot at goal" in football, the long or high jump in gymnastics, and the "knock out" blow in matters pugilistic, for instance; but I contend that the artistic result, requiring the exercise of oul as well as of body, must be of a higher and more lasting type, and, as such, worthier of thoughtful bringing to highest possible perfection. The only way to do it is to admit soul as a partner in the work, and as a enior, and not as a sleeping, partner. J. Rees.

CYLINDERS FOR STORING GASES UNDER PRESSURE.

Our contemporary, *Invention*, states that "the serious accidents which have happened from the bursting of cylinders in which gases have been stored under pressure have led inventors to address themselves to the problem of devising a cylinder by means of which the results of such accidents should be greatly minimised, or the accidents themselves be altogether prevented. Amongst others who have addressed themselves to this question is Mr. Lewin Terrey, of 55, Chester-street, Kennington-road, London, who is practically engaged in storing gases under pressure. Mr. Terrey's invention therefore comes with double force, as it is not the mere result of theory, but is founded upon every-day practice, which alone should carry weight in such matters. Mr. Terrey's object is to so construct these cylinders that, in the event of the pressure of the gases or other contents increasing to a dangerous extent, the cylinder shall be capable of expanding; further, if the pressure should become too great for the strength of the cylinder, then that a simple rupture should take place, the attendant danger being thus greatly reduced. To this end Mr. Terrey corrugates the cylinder either longitudinally or spirally, as shown in the accompanying engravings. Fig. 1 represents a cylinder with longitudinal, and figs. 2 and 3 cylinders with spiral, corrugations.

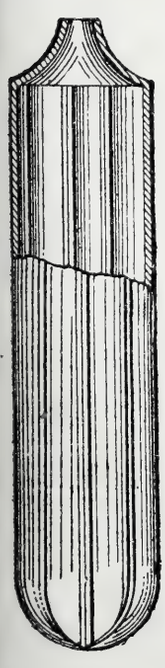


Fig. 1.

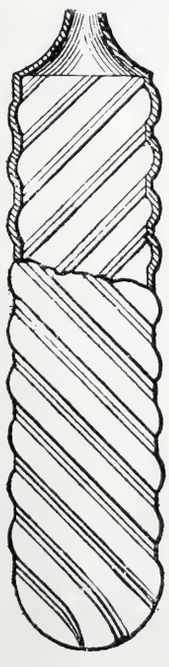


Fig. 2.

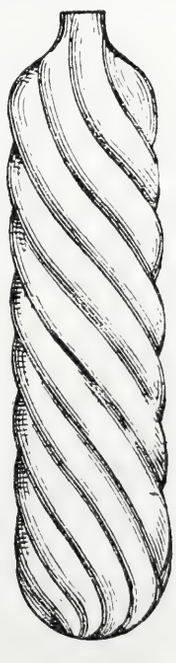


Fig. 3.

In figs. 1 and 2 the upper portion of the cylinder is shown in section, the lower portion being an outside view, fig. 3 being wholly an external view. Upon an increase of the internal pressure taking place, due to any change in the physical condition of the contents, the cylinder will expand, and thus accommodate itself to the altered conditions within. If, however, the pressure rises to such a degree that it overcomes the resistance of the cylinder, then the rupture will follow the lines of the corrugations, and consequently there will be no risk of any accident. As some may question whether the expanding action, claimed by Mr. Terrey, really does take place, we may mention that he has had a cylinder with spiral corrugations, as shown at fig. 2, made and tested, the result being that, when the pressure began to approach the maximum, the cylinder began to untwist and consequently to elongate. The pressure necessary to burst the cylinder was reached, and it simply caused a quiet rupture of one of the corrugations, thus showing that, in consequence of the corrugations, the cylinder expanded and was practically unburstable, a result much to be desired in the storage of gas. On the other hand, in case of undue pressure, the smooth-surface cylinders of ordinary construction would burst by reason of the cylinder not being able to expand, owing to the absence of either spiral or longitudinal corrugations. The matter demands attention, and, subject to further experiments to ascertain their bursting strength, Mr. Terrey's cylinders appear to meet the requirements attending the transport of gases under pressure. We commend this invention to the notice of the Government and of the County Council, who should satisfy themselves of its practical value, and thus be placed in a position to recommend it."

THE DISCOVERY OF OXYGEN AND THE "ENCYCLOPÆDIA BRITANNICA."

A correspondent writes to the *Chemical News*:—

"In spite of the indisputable fact that oxygen gas was first isolated and recognised as a supporter of combustion by the Rev. Dr. Joseph Priestley, on August 1, 1774, French writers on the history of chemistry have persistently claimed the honour of this discovery for Lavoisier. This unhappy attempt to transfer credit from an Englishman of science to a French one would not have received the support of Lavoisier himself, whose immortality in the annals of chemistry does not need to be magnified by mendacious claims.

"I have grown accustomed to this perversity on the part of the French; but imagine my surprise when I found that peculiarly English work, the *Encyclopædia Britannica*, coolly perpetuating this inaccuracy for the benefit of its Anglo-Saxon readers. In the ninth edition, under the caption 'Alchemy' (vol. i., 1878), are the following paragraphs:—

"'Lavoisier, who, by discovering oxygen, destroyed the theory of Stahl.'

". . . . 'and finally, in disengaging from the red-oxide of mercury oxygen gas, that Proteus, which so often eluded the grasp of the alchemist, till at last it was held fast by the subtle analysis of Lavoisier' (page 462).

"After I had recovered from the shock at seeing these statements in that monument of English erudition, I turned to the end of the article on alchemy to ascertain the authorship; it is signed 'J. A.,' which the key at the end of the volume interprets 'Jules Andrieu.' *Hinc illæ lacrymæ!* Why the editor-in-chief sought for a Frenchman to write the article in question it is difficult to conceive. Were there no Englishmen in 1878 competent to compile such an essay? And, having secured the article, were there no members of the editorial staff who had heard of Priestley and his discoveries in chemistry? Unfortunately for the staff, the articles 'Chemistry' and 'Priestley,' in which the fact is correctly given, only appeared in later volumes.

"Those curious in the matter will find the whole article on alchemy of interest, but not because it is judiciously written."

THE SCIENTIFIC REQUIREMENTS OF COLOUR PHOTOGRAPHY.

Recently Captain W. de W. Abney, C.B., F.R.S., gave the Sixth Robert Boyle Lecture before the Oxford University Junior Scientific Club. The subject chosen by Captain Abney was, "The Scientific Requirements of Colour Photography." The following is an abstract of the lecture, for which we are indebted to our contemporary, *Nature*:—

"Colour photography, and photography in natural colours, are two distinct methods of arriving at the same end, namely, the production of a picture of objects, coloured as they naturally appear to the eye. Both have been accomplished and depend on the application of science, but in the case of the former additional knowledge is requisite of the mode of action of the retina and of theories of colour vision.

"In colour photography the theory of colour vision usually adopted is the Young-Helmholtz three-colour theory, in which red, green, and blue are selected as primary colours, and not the red, yellow, blue of the artist. Captain Abney pointed out the difference between colour and colour sensation, and placed his colour sensation curves before the audience. These curves enable particular coloured screens to be selected, so that if transparencies from three photographs of the same object, taken one through an orange screen, one through a green, and one through a blue, be each illuminated by its own peculiar coloured light, and the three images be superimposed, the effect is to reproduce a picture of the object in its original colours. The colours of the screens used for

taking the negatives must not be such as to allow only monochromatic light to pass. Thus the red screen must allow some orange, the green some yellow, and the blue some green, so that the lights through the three screens overlap somewhat.

"The viewing screens, on the contrary, should be as nearly monochromatic as possible. By these means Mr. Ives has, in his chromoscope, been able to present to view photographs of natural objects in the colours in which they appear to the eye.

"The next process described was that of Dr. Joly, of Dublin, who, basing his work on the same theory of colour vision as Mr. Ives, reproduces in colour by means of a single negative. This method is essentially founded on what may be called a happy imperfection of the eye. The human eye is incapable of separating points which lie very close to one another. In an engraving, the black lines, close together on a white surface, blend with the white surface to form shades of grey. Dr. Joly's method is to rule lines $\frac{1}{200}$ inch broad on a transparent screen, touching one another and being coloured alternately red, green, and blue. The lines are of such a depth of colour that the mixture, if made by rotating sectors, would appear white or grey. This screen is used for viewing. To make the negative, another exactly similar screen is placed in front of the plate, but the colours of the lines on this differ, just as Mr. Ives's coloured screens for taking the negatives differ from his viewing screens.

"When the negative is taken, a transparency is made from it, and the viewing screen is placed behind it, so that the red line covers the place through which the orange negative was taken, and so on. Then, and not till then, the picture appears in its natural colours.

"Instead of using transparencies and coloured films, transparent inks may be used to produce pictures by three printings.

"The next process described was the oldest, namely, the production of colour by the action of light itself. The present year is its jubilee. Becquerel found that if, instead of iodising a plate, he chlorinised it, and then exposed it to white light, it gradually assumed a violet tint, and, if in this state he exposed it to the spectrum he was able to obtain the colours of the spectrum on it.

"Abney, some years ago, showed that the red tint was due to the lavender-coloured material taking up oxygen, whilst at the violet end the sub-chloride became further reduced; thus the big molecules formed by the addition of the oxygen vibrated slower, whilst the abstraction of chlorine gave smaller ones vibrating quicker. Since he was able to get the same effect on collodion plates, it is not probable that the colours are due to stationary waves, because, if so, they could only be viewed by reflected light. Unfortunately, however, these colours, from the very manner in which they were produced, were not permanent, and no method has been devised for fixing them.

"The last method Captain Abney described of obtaining photographs which showed colour, but not coloured photographs, was that of Lippmann, who found that if, by means of reflection, he obtained stationary waves in the film, on development the silver was deposited between the nodes. On reflecting light from such a 'noded' plate, the proper light alone was reflected, and the photograph, viewed at a particular angle, appeared in its natural colours. If looked at by transmitted light, these photographs have merely the appearance of ordinary negatives."

ACETYLENE GAS IN THE PHARMACY.

Being in an English pharmacy abroad, says a French correspondent of the *British and Colonial Druggist*, in which this gas is used as the illuminant, I noticed the difference between the ordinary coal gas and the acetylene, and I have no doubt my English *confrères* would like to know something of its use, handiness, effects, and cost.

First of all, in use it is exactly the same as ordinary gas, with the difference that it is made at home instead of coming through the meter. Instead of having the pleasure of waiting for that familiar quarterly bugbear known as the gas collector, one orders the carbide of calcium from the wholesale house in suitable quantities as required, according to storage room. Of course, the larger the amount ordered, the cheaper comes the gas. It is treated in exactly the same manner as coal gas, and can be put in use in houses where the gas pipes have already been laid.

A great deal has been said about its danger when in contact with various metals; but, as gas installations are put in with composition lead piping, and the brackets are brass, it forms no explosive compound, its only antagonist being what is technically termed red copper; when copper is mixed with other metals, it is without any danger. Of course, if an escape is suspected, no one of common sense would search for it with a light, the nasal organ being quite sufficient to detect the gas at once.

For outdoor lighting there is nothing to come up to it, for it is difficult to blow out even a small jet.

It is just as handy as ordinary gas in every way; and what gives it a great advantage over the coal gas is, that it can be used in portable lamps without the use of compressed cylinders, and without any danger. In the lamps the gas is generated as required in the reservoir-like body.

As an instance of the handiness and safety of these lamps, the proprietors of the coal mines at Carmaux, France, have ordered a large number to be used in place of the candle lamps, with the ordinary fire-damp-proof mantle for the miners. In its working, it gives a light which is very brilliant, and far surpasses coal gas and electric incandescent light. I have read for some time near it without ever feeling my eyes tired in any way. Three burners, consuming twelve litres per hour, light up well a fair-sized pharmacy. It is not so heating as coal gas; one can lift a globe off a burner with the naked hand. It is smokeless, except when there is not enough pressure of gas, which is easily regulated by weighting the gasometer.

As regards cost, it is not a very big item, considering the amount of light given; for, where one would need six or seven big burners of coal gas, four small ones would be sufficient with acetylene, hence the saving. The present price of carbide of calcium being about 3*d.* or 4*d.* per pound, and one burner consuming the acetylene given off from one pound in six hours, it can easily be reckoned how much it would cost to light up a house. This gas can be applied to exactly the same purposes as coal gas is at present, using special burners for heating purposes.

Of course, there is the making of the gas, for which there are several makes of apparatus. The one in use in this pharmacy, and which is quickly coming to the front, is one in which the water reaches the carbide through capillary tubes, therefore dropping slowly and regularly; hence, when there is too much pressure of gas, the water stops dropping and the action ceases. The apparatus consists of three articles—water tank, gazogene, and gasometer, the water dropping in the gazogene, from which the gas is collected in the gasometer. As the latter rises, it turns off a tap, which stops the supply of water until the gasometer has again descended to a certain point; hence there are two safeguards against having more gas than is sufficient at a time in the gasometer to keep the lights burning. The gazogene can be charged with sufficient carbide to last about a week. The lamps are without gasometers, that being the only difference with the fixed apparatus. Acetylene gas is now used in bicycle lamps, the carbide being where the oil would be, and the water being in the back. As a matter of fact, acetylene can now be used up exactly the same way as oil.

THE "APTUS" COMBINATION LANTERN SCREEN AND BACKGROUND.

Sharp & Hitchmough, Dale-street, Liverpool.

This combination of lantern screen and background is absolutely opaque, the screen side being pure white, while the background side is coloured to a suitable tint for photographic purposes. The material of which it is made is seamless. The illustration shows it mounted on a portable

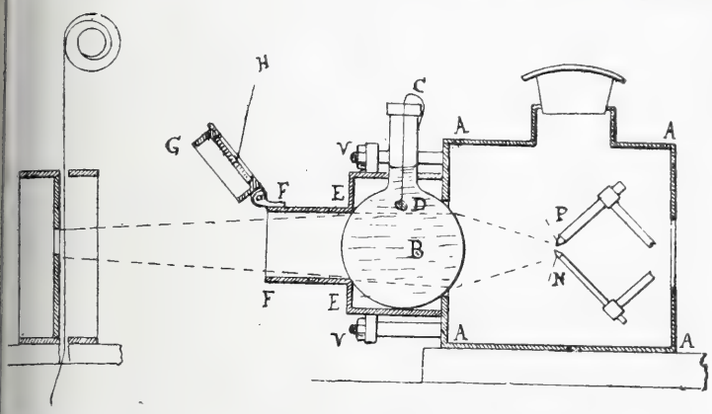


elevator, which may be readily set up or taken down. The latter piece of apparatus, which would be found useful by both professional and amateur photographers, is supplied separately; but the screen-background is mounted on rollers top and bottom. Messrs. Sharp & Hitchmough are ever foremost in catering for the varied wants of modern photographers.

SAFETY APPARATUS TO REPLACE THE CONDENSING LENS IN LUMIÈRE'S CINEMATOGRAPH.

The lens which has hitherto been used for projecting, and which served to concentrate the luminous rays, also concentrated the heat very strongly upon the film, and the film was liable to be damaged if exposed too long to this heat. Arrangements have therefore been made to avoid this, and it is now replaced by a so-called balloon condenser (a glass globe filled with water). Similar arrangements have already been used, in the shape of square glass troughs interposed between the condenser and the film, such receptacles having flat and parallel sides; but this has proved a very insufficient mode of avoiding the heat, in consequence of

difficulty of making the square trough water-tight, or sometimes, by oversight, the water has been lost or escaped without the operator



AAA, projecting lantern. B, condensing balloon. C, wire suspending a small piece of coke, D. EE FF, black enamelled metal box to fix the balloon up against the lantern by means of the bolts and nuts, VV. G, stop valve, provided with a movable ground-glass screen, H. PN, electric carbons.

aving noticed it. The danger, therefore, becomes so much greater, as ie operator, counting upon the trough, might leave the film stationary hilst it is being illuminated, a thing he would never do if he ere using the condensing lens only.

With the balloon globe replacing the condensing lens, the ays of light are concentrated without any appreciable loss of ghting power, and it absorbs the greater part of the heat ays. During an hour of continued projection, the water comes a boiling point without the least inconvenience. The temerature remains constant, and rises very little. The light, by is arrangement, is whiter, and the effect of the greenish olouration of the light caused by the condensing lens is ltogether suppressed. If the balloon globe has to be removed or any reason, or if the water runs away or evaporates, no consation of light rays takes place, and consequently the perator need not be afraid of any heat on the film. Thanks this arrangement, it becomes impossible to commit serious istakes, the whole concentration being produced by the eutral body which absorbs the heat rays.

To avoid projecting when the water is at boiling point, it is fficient to suspend a small piece of coke (attached to a wire) nto the globe, and the evaporisation of the water then goes on ith the greatest regularity.

The annexed sketch represents the above-described arrangeent, and all Lumière's cinematographs will in future be upplied with this new system of condenser.

AN IMPROVED LANTERN SCREEN.

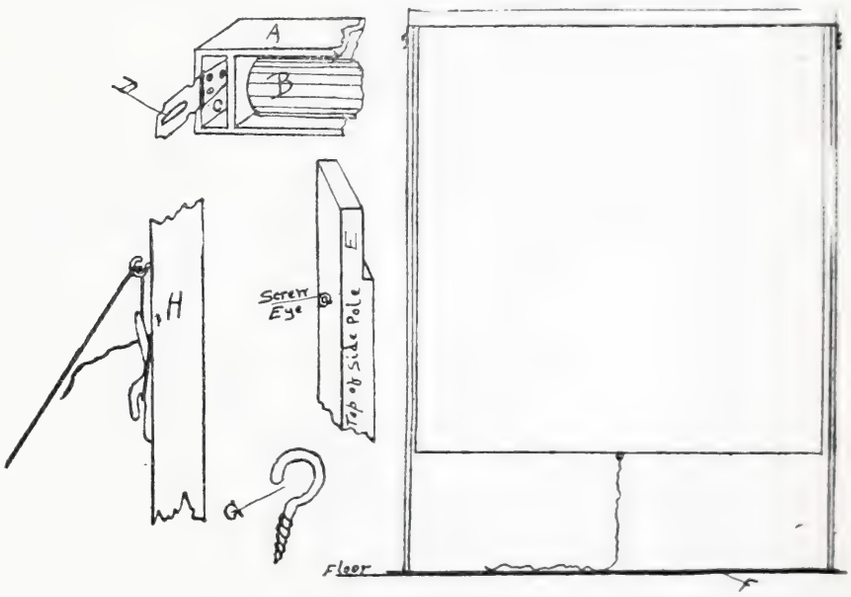
A CORRESPONDENT of the *American Amateur Photographer* has supplied hat journal with the following illustration and description of a very onvenient lantern screen: From past experience I am led to state my elief that the lanternist who owns a *good* screen "has half the battle." very book on the lantern will tell you "a plain white wall is the best creen." Acting on this hint, and recognising the fact that a "plain hite wall" is a trifle awkward to carry from place to place, I began xperimenting toward making a plain white wall which would *roll up*. he different ideas which I carried out got to be so numerous that I eceived from my wife the doubtful compliment that "I had gotten to be regular tinker," whatever that may be, and that, if I kept on, I would need o erect a building to hold all my "old truck." My first experiments all ay in the line of coating cotton cloth with alabastine or kalsomine, or ne of the many similar whitewashes which are numerous on the market, ut they all had the same fault. In a very short time my screen was overed was covered with cracks, and was hard to unroll; but one lucky ay I thought of heavy holland or store window-shade stuff. My steps nstantly turned toward a store where such goods were found, and, in nswer to my question, I discovered that these goods can be bought erfectly white and as wide as 12 feet. I at once ordered a piece 100 nches square, which was as large as I could well use in my residence, nd, after considerable thinking, I designed the outfit shown by sketch erewith. It is a great big success—it might have been bigger if the creen had been larger, and whoever wishes can make their own success s big as they choose *up to* 12 *feet square*, remembering always that an -foot picture on such a screen as this is fully as satisfying as a 10 or 2-foot picture on the usual cotton screen, which allows a large portion of he light to sift *through* its meshes, and lose itself in the beyond. The ne drawback is the *weight*, and this is against its transportation long istances by rail; but where parties use the limelight, and are obliged to call in the services of a dray to carry their outfit from one part of a city to another, this added weight really cuts no figure.

As shown by the large drawing, the whole outfit consists of three parts, the long box containing the screen, mounted on the usual spring roller, and the two side uprights.

My outfit measures as follows:—Length of screen box outside = 9 feet, 1 inch; square of screen box outside = 4 × 4 inches, *not including cover;* length of side uprights = 12 feet; square of side uprights = 3 × 1¾ inches.

The drawings, I think, give a pretty good idea of the way of building the outfit and using it. The screen box is made from pine, say ⅝ to ¾ thick, with sockets built into each end, as shown at C; into these sockets fit snugly the rabbeted ends of uprights, E; screwed flush with the inside of socket is a common hinge hasp, D; when the end of upright is shoved into place in the socket, the slot shown in hasp fits over a strong *screw eye*, which is screwed into sides of upright, as shown; simply give this screw eye a *half turn*, and the upright is locked firmly to the screw box. The *cover* of the screen box is not *hinged* to the box, but is fastened with small flat hooks and eyes, and comes away entire from the box, and is laid *on the floor* at point designed to erect screen (see F). This cover has a small hole near either end, and strong pegs project from lower end of each upright. These pegs engage with holes in ends of cover to keep uprights in position at bottom. To keep whole outfit upright, I called in my sailor experience.

Cut away a portion of four strong screw eyes as shown at G. Screw these eyes into opposite edges of the uprights about five feet from floor, and about six inches below each eye fasten what is known to a sailor as a



3-inch "Blanche cleat" (L. W. Ferdinand & Co., of Boston, can supply them if you cannot find them elsewhere); fasten them to uprights with the *short horn* pointing *down*. Now provide four pieces of good ¼-inch rope, each about 8 feet long, and to one end of each fasten a common small snap hook. Now, at four points in floor angling out and back from side uprights, screw four strong screw eyes, snap on each one of the hooks with cord attached; now with one person's assistance raise the screen box and side poles to place, pass each rope over open screw eye, down under short horn of Blanche cleat up and "jam" rope between long horn of cleat and upright as shown in sketch H. By means of a cord fastened to centre of strip along lower edge of screen, the screen can now be pulled down or raised at will.

Two persons can put up or take down the whole outfit in five minutes' time. When put up as shown and ropes pulled taut, it stands "stiff as a church," and the clearness of the picture on the smooth opaque surface of this style of screen will richly repay for the expense and trouble of getting up the outfit.

ADAMSON'S IMPROVEMENTS IN ELECTRIC-LIGHT APPARATUS FOR PHOTOGRAPHIC PURPOSES.

THIS improved apparatus is designed, not only to meet and remove objections to the present forms, but to make it applicable for other purposes than those described in the prior patents.

In the prior Patent, No. 5971, A.D. 1894, it was found that the rocking motion, unavoidably given to the whole apparatus through its requiring to be so freely moved in all directions, caused the contact springs to part from the contact rings, making dangerous arcs, and so destroying their surfaces, rendering them at once unfit for use, and in like manner the device shown in the Patent, No. 2333, A.D. 1895, although an improve-

ment on the patent just referred to was found also very liable to serious arcing between the frictional surfaces. This was caused not only by the rocking motion already referred to, but mainly to its being nearly impossible to get all the frictional surfaces so exactly turned on the same plane as to ensure equally good electrical contact between both pairs of rings, the slightest divergence causing one or other pair either to be completely parted, or so slightly in contact as to produce an arc, which, however slight, at once rendered the apparatus useless.

Fig. 1 is a section of the swivelling apparatus.

Fig. 2 is a view of the reflector.

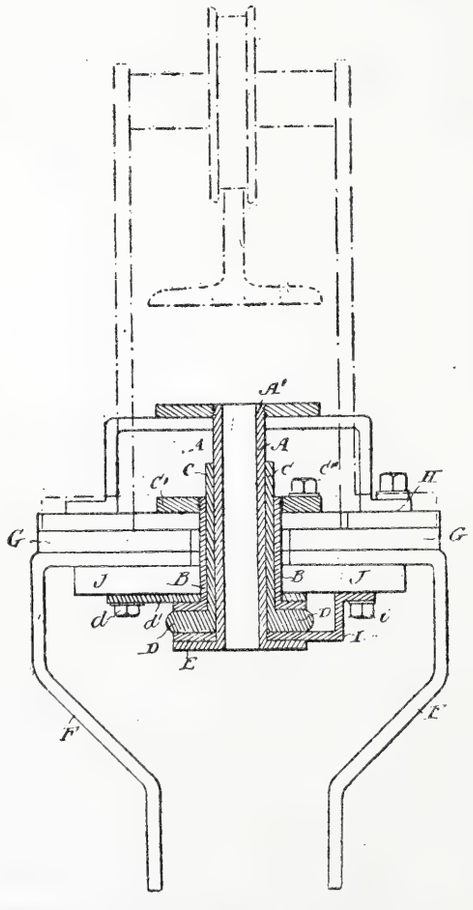
Fig. 3 is a section of the pivotal arrangement in connexion with the suspension of the reflector.

Fig. 4 is a section of the pivotal arrangement in which the reflector turns.

Fig. 5 is a view of the whole arrangement of the apparatus.

According to my improved form, says Mr. Adamson, the swivelling apparatus, of which fig. 1 is a section, consists of two metal tubes, A and B, one placed within the other, and of such diameter as to permit of their being properly insulated from each other by the insulating tube, C, and flange, D. To one end of each tube there is attached, either by casting or otherwise, a flange of any convenient breadth. The flange, E, of the inner tube, A (fig. 1), is so constructed as to bear the weight of the whole

Fig. 1

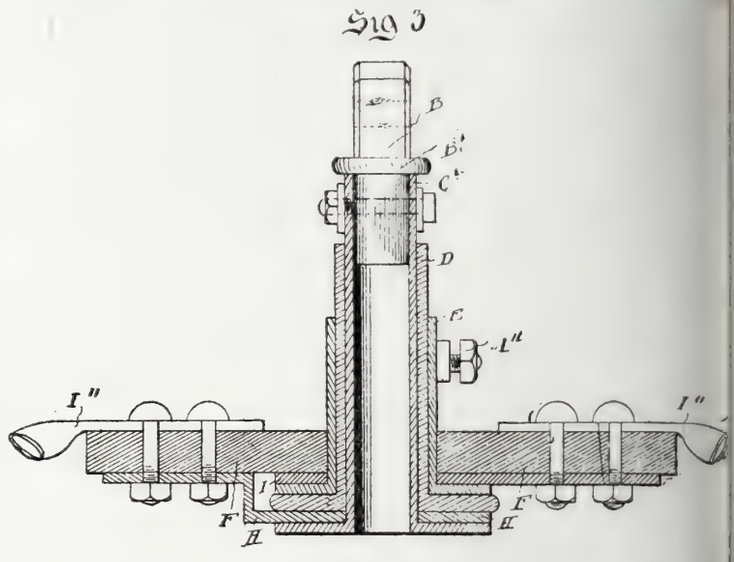


pendent apparatus, while the outer or larger tube, B, must have sufficient length free at its upper end next to the base of the upper section of the carriage, G, that, when the weight comes upon the under section, F, of the carriage, G, and bears against the flange, E, of the inner tube, A, there will be no impediment to the whole of the rubbing surfaces being drawn closely together.

When current is made to enter, it will pass along a plate or washer, H, to the inner tube, A, and from this tube to another plate or washer, I, by which it is connected to the cable by means of the nut, *i*, which, in turn, carries it to the beam pivot, *a* (fig. 2). The return is made similarly by entering on the under side at *d*, and passing through a similar plate or washer, d^1, to the outer tube, B, thence by another plate or washer, c^1, and connected to main cable at c^{11}. Both washers, c^1 and A^1, on the upper section of the carriage, G, are shaped and fitted over their respective tubes, A and B, so that the tubes remain stationary, whilst the plates or washers on the under section, being fastened to the insulation plate, J, are left free to move and maintain a constant position relatively with the revolving section of the carriage and the beam.

The same electrical pivot is adapted to support the reflector as shown

Fig 3



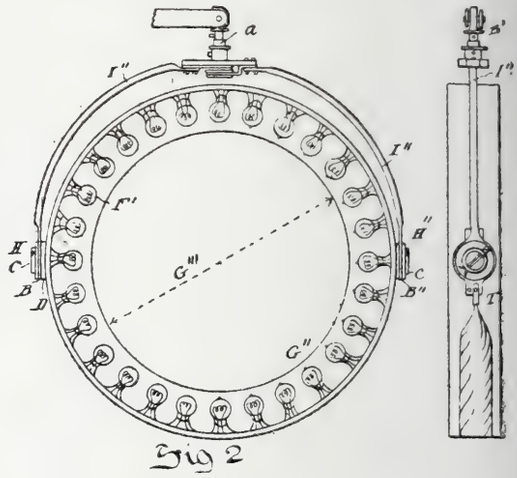
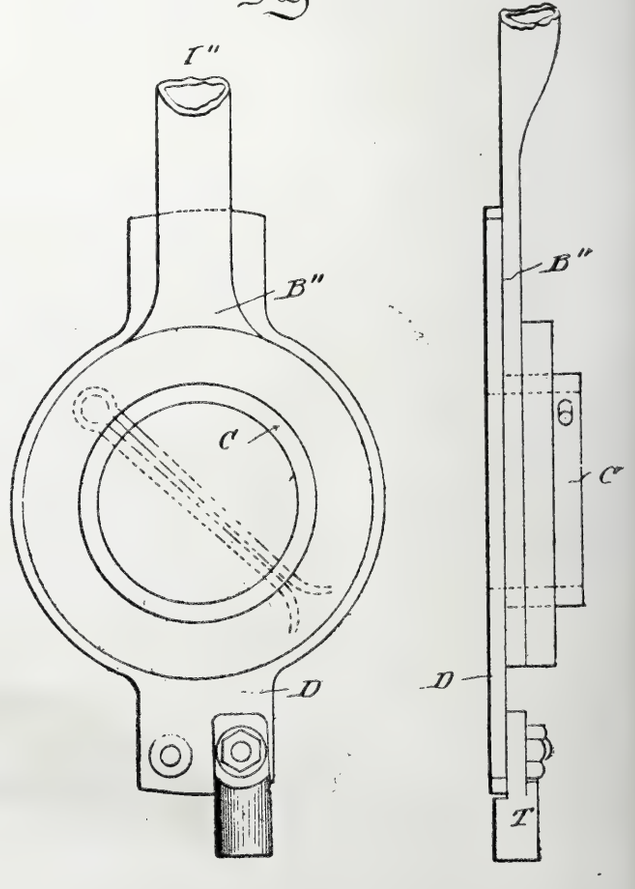


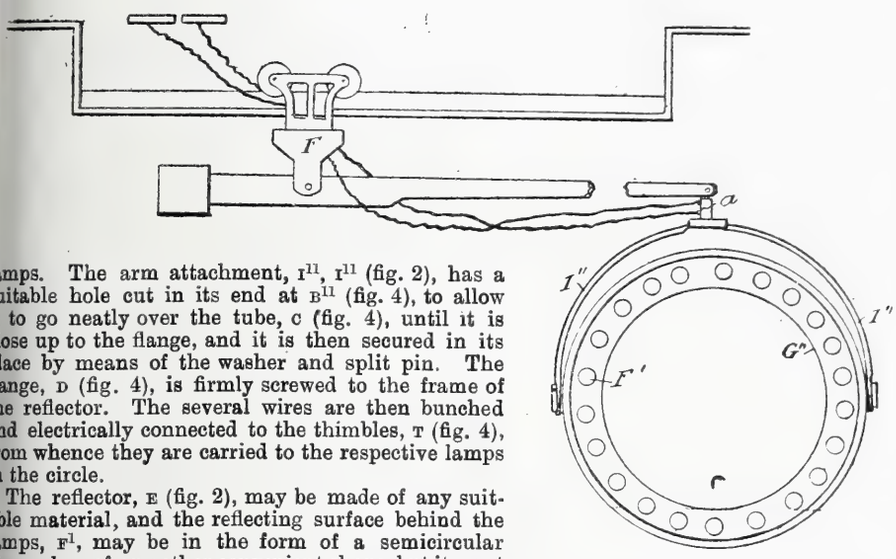
Fig 2

Fig. 4



t *a* (fig. 2). The current is conducted, as already stated, from rminals, *i* and *d* (fig. 1), by means of flexible or other cables to rminals, A[II], A[II] (fig. 3), and from thence through their respective ıbes to the arms, I[II], of the reflector, G[II], G[II], and the reflector pivots, [II], H[II], fig. 2 (shown in detail in fig. 4), which distribute it to the

Fig 5.



amps. The arm attachment, I[II], I[II] (fig. 2), has a suitable hole cut in its end at B[II] (fig. 4), to allow it to go neatly over the tube, c (fig. 4), until it is close up to the flange, and it is then secured in its place by means of the washer and split pin. The flange, D (fig. 4), is firmly screwed to the frame of the reflector. The several wires are then bunched and electrically connected to the thimbles, T (fig. 4), from whence they are carried to the respective lamps in the circle.

The reflector, E (fig. 2), may be made of any suitable material, and the reflecting surface behind the lamps, F[I], may be in the form of a semicircular channel, or of any other convenient shape, but it must not project inwards on the diameter of the circle more than is necessary to completely screen the lamps from the back, the object being to form a clear space, G[III] (fig. 2), of as large a diameter as possible in the centre of the reflector, so that the apparatus may be better adapted for copying or reproductive work, whilst being equally suitable for portraiture, as, in the event of a large flat surface requiring to be very equally illuminated, it will be obvious that such a result could be more easily secured if the light can be placed directly in front of the camera, and the flat surface or picture viewed through the central space, G[III].

From the foregoing it will be seen that the electrical pivots are ensured of good contact by the weight of the respective parts which they support, and that, by the combined operation of the four pivots, a perfectly universal motion may be imparted to the reflector.

It is to be understood that the improvements are also applicable to standards and ceiling pendants, which may be provided with one or more reflectors, and used either for photographic purposes or ordinary illumination.

THE DISCOVERY OF ZIRCONS IN TASMANIA.

Among the many valuable discoveries of late in the colony of Tasmania, one which has created much interest in mining circles has recently been partially developed. In consists of a rare and unique deposit of zircons allied with other gems and rare earths. The gems found in this deposit are chiefly zircons, sapphires, and cinnamon rubies. The first-named are found in large quantities and in every variety of colour. Many of them have been cut and polished with very gratifying results, being hard and of good lustre. The United States Consul-General at Melbourne, who has lately been making an investigation into the circumstances of the discovery, says that the specific gravity of the zircon is 4·7, thus being heavier than the diamond, which is 3·75; its hardness, compared with the diamond, is 7, the latter being 10. At the same time it is purely incandescent, being unaffected by the most intense heat, thus proving it to be of high commercial value for use in the manufacture of mantles for incandescent lights. It must be understood that the product of the gem, namely, oxide of zirconia, is used for the above purpose, not the gem itself. The composition of the pure zircon is 64 per cent. zirconia, and 36 per cent. silica. Analyses by Dr. W. H. Gaze, of Melbourne, of two samples of zircons from the above-mentioned deposit, give 63 per cent. and 64 per cent. of zirconia, thereby testifying as to the purity of the gem. The rarer earths, namely, lanthanium, thorium, didymium, niobium, erbium, cerium, and chromium are all more or less present. The property which contains this rare deposit has been purchased by a Melbourne syndicate. It comprises an area of 105 acres, and is situated on the north-west coast of Tasmania, about midway between Emu Bay and Circlar Head, and is easily accessible by road from either port. A large amount of work has been done in cutting races and forming dams for sluicing purposes, much labour being expended in removing the heavy timber from the creeks. The deposit of zircons is found in the bed and sides of the creeks, covering about a chain in width. From about nine to eighteen inches from the surface a gravelly wash is met with, averaging about eight inches in depth. This wash contains the zircons and other rare earths or minerals, and rests in a blue clay bed from one to two feet in thickness; then occurs a sandstone bar. The zircons and by-products are obtained by sluicing, the best results being secured by grading and concentrating by gravitation.

AIR'S FINDER.

Mr. J. Airs has patented an improved finder or camera obscura, in which the reflecting surfaces are adjustable, and which can be rotated in conjunction with or without the rotation of the lens; and so arranged as to give a true or non-distorted image or reflection on the screen or screens at any angle of its rotation.

It is the usual practice, in hand cameras, to use two view-finders or camera obscuras, with fixed mirrors and lenses in each, one for obtaining the vertical, and the other the horizontal view.

"By using a revolving mirror or reflecting surface," says Mr. Airs, "I obtain both views with one finder, or any number of views, according to the screens employed, the mirror being directed to whichever screen the image is required upon. For instance, a lens and mirror placed at a given angle so as to revolve inside a cylinder consisting of a ground-glass surface, a view or reflection can be obtained on any part of the aforesaid cylinder.

"Fig. 1 is an elevation of a rectangular finder, and fig. 2 is a top view of the same.

"Fig. 3 is an elevation of the lens and reflector detached from the case, and fig. 4 is a vertical section of the same.

"The case, *a*, may be rectangular (as shown), polygonal, or cylindrical, according to the number and direction or angles of views required. *b* is the cover of the finder. The lens, *c*, is fitted, as shown in fig. 4, and is held in position in the cylinder, *d*, by a ring, *e*. *f* is an annular disc,

FIG. 1

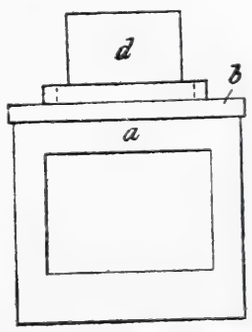
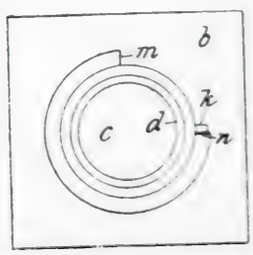


FIG. 2



which is screw-threaded to fit the screw formed at the lower end of the cylinder, *d*, acting as a nut to secure the cylinder, *d*, to the cover, *b*. *g* is a plate soldered to the annular disc, *f*, which sustains the reflector, *h*, in position.

"The cylinder, *d*, is capable of being rotated by hand in any required direction, independently of the cover, *b*; and, when so rotated, it carries

FIG. 3

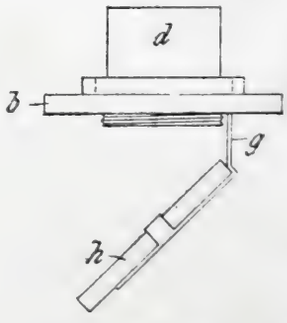
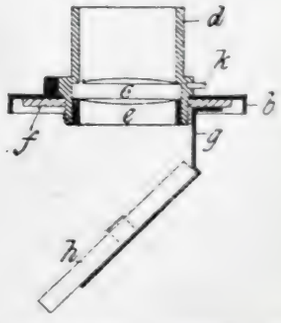


FIG. 4



therewith the annular disc, *f*; plate, *g*; and reflector, *h*. These movements enable the operator to obtain any number of views, according to the screens employed, a ground-glass cylinder being sometimes used, as before mentioned.

"When applying my invention to a rectangular finder as shown in the drawings, a pin, *k*, is fitted to the cylinder to limit its motion to an angle of 90°, by contact with stops, *m n*."

ELECTRIC-LIGHT LAMPS FOR MAGIC LANTERNS.

For a long time magic-lantern operators have been trying to adapt the electric light to the purposes of projecting views on photographic slides upon the screen, says the *American Journal of Photography*, but the expense, together with the inconvenience in handling the light, as well as its too great intensity, have been the principal drawbacks to its introduction. Recently, Mr. Arthur W. Yale, of Philadelphia, has devised a new form of the arc-light lamp which is simple in structure, easily managed, giving a uniform, powerful, yet at the same time soft, illumination with the minimum amount of heat.

In order to secure this quality of illumination, the carbons are enclosed in an encasement which is practically void of oxygen, thus preventing their consumption, and are so arranged that they can be adjusted by means of a simple device, requiring less attention than the operating of a calcium light, and giving much greater illumination.

The bottom carbon burns away about one-thirtieth (1-30) of an inch per hour, hence it is only necessary to feed the upper carbon. This carbon can be *instantly* brought in contact with the lower carbon and instantly raised, at the same time the most minute adjustment of the arc can be made, a result heretofore unattained.

The lamp can be "set" at any angle, and will fit any lantern, set-screws or posts being unnecessary on account of the heavy base. The oil lamp or the calcium jet need simply be removed and the arc light set in its place.

This lamp consumes less ampères than any other arc lamp, hence it is cheaper to operate, yet the candle power is nearly as high as the most powerful "open arc incandescent" lamp on account of the high voltage. This lamp can be seen at any time at the photographic establishment of W. H. Rau, corner of Juniper and Chestnut-streets.

LIVING PHOTOGRAPHS.

During the past year there have been on exhibition at numerous theatres instruments bearing various fanciful names, but all based on the same scientific principles, and giving practically the same results. Enlarged photographs are thrown on a screen, as with an ordinary stereopticon, but with this difference, that the objects represented are all in motion, the same as in nature. The waves are seen rolling in and dashing on the rocks, horses gallop, men walk and run, and railroad trains draw up to a station and stop, while the passengers alight and depart with their baggage, exactly as in life, even the varying expressions of their faces being perfectly shown; and there is no limit to the variety of moving scenes which may thus be reproduced, except the limitations of the photographic art itself.

These effects are due to a curious physiological law known as the persistence of vision. If any object at which we are looking is suddenly withdrawn from our sight, or if we close our eyes, we do not cease to see it at once, but the image remains for a short time on the retina of the eye, varying in different eyes, but usually from one-thirtieth to one-fiftieth of a second. This may be easily proved by whirling around the glowing end of a lighted splinter of wood held in the hand. The eye cannot follow the movement, but the images of the spark of fire impressed on the different parts of the retina as it is moved around unite into one, and a complete circle of fire is seen. Another way to illustrate this principle is by cutting a disc of cardboard, and drawing on one side a picture of a bird, and on the opposite side a cage. If the disc is rapidly rotated before the eye by twisting two threads attached to opposite sides, the image of the cage will persist in the eye until the side on which the bird is drawn comes round and the bird appears to be inside the cage.

Now, to apply this principle to the vitascope photographs, we will take the simple subject of a man walking, and will suppose that he takes one complete step a second. If during that second we could take, say, twenty-five or more consecutive photographs of him, we should have a complete series of views, showing him in the first one just lifting his foot from the ground, and returning it to the ground in the last. This is exactly what has been accomplished. Photographic films are now made so sensitive that a picture may be taken in a much less time than a twenty-fifth of a second; and, on a flexible transparent ribbon of celluloid, a series of several thousand consecutive views of any moving object may be taken, showing the varying changes at intervals of a small fraction of a second during a period of several minutes.

It must also be noted that the ribbon of sensitised celluloid is not simply passed before the camera lens with a uniform movement while the pictures are being taken; this would give only an indistinct blur. The delicacy of the machinery is such that the sensitive film stops before the lens while the picture is being taken, and then moves on a sufficient distance to bring a fresh part into the field of view, the lens being covered by a shutter during the movement of the film, and repeats this twenty-five times a second with perfect accuracy. Practically, it is found that the film is stationary for about eleven-twelfths of one twenty-fifth, or eleven three-hundredths of a second, while the remaining twelfth of the time, or one-three-hundredth of a second, is occupied by the shifting of the film.

After having obtained the strip of pictures, they can be thrown on a screen by a system of lenses in the same way as with an ordinary magic lantern. To give the effect of motion, it is only necessary to repeat the process by which they were taken. The strip of pictures is rapidly wound from one spool to another in the lantern, each picture stopping for about a thirtieth of a second, and then passing on and giving place to the next. Owing to the persistence of vision, each picture remains upon the eye until it is replaced by the succeeding one, and the illusion of natural motion is perfect. The effect as a whole is beautiful and fascinating beyond description, and no one should lose an opportunity to see such an exhibition.

Although the principle of the persistence of vision has been known for many years and applied to the production of the illusion of moving pictures, the marvellously delicate and accurate machinery necessary to take so many consecutive photographs of actual scenes from life, and project them properly upon a screen, is the product of the past two or three years. The credit of the invention is claimed by several different persons, but it is probable that it belongs to no single inventor, having been perfected by several working independently, but at the same time.

At present there is some room for improvement in the clearness and steadiness of the views as thrown upon the screen, but this is simply a matter of mechanical detail which will, doubtless, soon be attained, and, in combination with the phonograph, the possibilities seem almost endless. Not only scenes and events of historical and world-wide interest, but the very words and tones of the speakers engaged in them, can be recorded and preserved for future generations. Although the vitascope has hitherto been only an amusing toy, it will, doubtless, in the future prove to be of distinct scientific value, and hold an important place in the education and enlightenment of mankind.

Austin P. Nichols, S.B., in the *Photographic Times*.

Mr. Charles F. Easton, of Wallace, Idaho, has patented an improved lantern for employing the Röntgen rays for experimental, demonstrative, or practical purposes, the lantern body being opaque to X rays, and having a front aperture and fixed disc, whose central opening registers therewith, while an adjacent parallel rotatable disc has graduated apertures which may be brought into coincidence with those in the fixed parts. Arranged in the case on a sliding carriage is a Crookes' tube, and means for making a rapid or slow and fine adjustment of the tube.

Mr. Alfred Underhill writes: "I have succeeded in getting snapshot photographs of Jubilee street decorations, and intend publishing same as lantern slides, prints, &c., subjects comprise 'London Bridge' 'King William's Statue,' 'Monument,' 'Temple Bar Memorial,' 'Bank,' 'Royal Exchange' 'Fleet-street,' 'Strand' 'St. James's-street, &c.

Calcium Carbide.—The Home Office have made one small though important correction in their recently issued rules for the storage of calcium carbide. The change has reference to the purity of the product. Clause (*d*) now reads: "The keeping and use of *commercially* pure carbide of calcium only, and the establishment of efficient arrangements for the sampling and testing of the carbide."—*Chemical Trade Journal.*

A Wonderful Lunar Phenomenon.—Writing from Kyre-park, Tenbury, Worcestershire, Mr. F. C. Baldwyn Childe says: "From this place on Tuesday, June 15, at 9.30, appeared across the moon three black bars like boards. They quickly disappeared, the centre one lasting the longest. The moon was very red at the time, and looked unusually large. There was also a projecting ball of light, described by one of the observers as 'something like a crown.'"

Luminous Stones.—A contemporary records the discovery of a mysterious luminous pebble, the chemistry of which is being investigated in the laboratory of Philadelphia. A short time ago an Italian farmer in California went to bed, having forgotten to turn off the supply of water from his irrigating appliance. He remembered his omission suddenly during the night, and proceeded to his fields, which he discovered had been converted into a perfect swamp. While endeavouring to repair the mischief he came to a hole made by the water, and perceived something shiny. He picked it up and saw it was a luminous pebble, emitting light sufficiently strong by which to read the time on a watch. Other similar pebbles were lying near, and he took a stock of them home. The next day he told some friends of his experience; but, as the pebbles were not luminous in daylight, they laughed at him. At night, however, they began to shine again, and the friends were converted by ocular demonstration. It remains to hear from Philadelphia particulars concerning these wonderful stones.

At the rooms of the American Institute, Photographical Section recently, Mr. Alfred Stieglitz showed a remarkable collection of slides consisting of about one hundred and forty subjects, specially selected from his work of the last few years, and covering landscape, genre portrait, wind, snow, and other fields of illustration. Some particularly fine effects were displayed in snowscapes and mountain scenery, where by chemical manipulation in development, the sky was sent back to its proper optical position without detriment to the details in high lights or dark shadows. Several views of street scenes, where the actual effect of falling snow and steam rising from the bodies of weary horses were strikingly apparent, and two or three night scenes in the city and moon light effects on water, were of great interest and merit.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*August 6, 1897.*

THE LANTERN RECORD.

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LANTERN MEMS.

It is a little difficult to find a theme on which to write this month with one's thoughts far removed from optical projection, in the midst of holiday folks, and having only recently returned from the canvas city of Bisley Camp. This season, however, has been a wonderfully good one for hand-camera enthusiasts, and the number of photographers present at the important events of the record reign festivities has been not only noticeable but remarkable.

* * * * *

Bisley Camp was not an exception, and, when any of the Colonials or a special visitor was shooting, the number of snap-shots taken, according to the reports in some of the lay papers, was somewhat disconcerting to the competitors. Personally I saw nothing that would be likely to interfere with the "old hands," who, after making a string of seven bull's-eyes in a competition, could put on another three for tie shots, and then go on, as it seemed, for almost any length of time, and only occasionally drop out of the bull's-eye. With the business part of the photographic work in camp, there seems to be no lack of occupation, what with taking the winners in the important competitions, such as the Queen's Prize and the Imperial Prize, or the Victorian South Australian team, that carried off the Kolapore Challege Cup against the mother country and the other colonies, and the Bradfield School team, that won the Ashburton Shield against the largest number of teams from other public schools that have ever been known to compete at these gatherings.

* * * * *

Special sittings were secured from a representative of the native Indian army in gorgeous uniform, and also from the only lady shootist, Miss Leale, of Guernsey, while the special marquees came in for a share of attention, notably the Kynoch Ammunition Company's tent, with its fine display of stags' heads and stuffed birds to relieve the businesslike grouping of the cartridges, ranging in size from the midget to the giant; in fact, one of the cartridge cases was so large that it reminded one of a forty-foot gas cylinder, and was interesting to a lanternist from its being drawn from a cast disc or bowl of metal somewhat in the same way as a steel cylinder.

* * * * *

One little variation was made that may be permissible to note, and that was, some long-distance signalling was arranged for to test the power of some paraffin flashlight lamps, and the writer and some friends drove a matter of ten miles, and flashed from St. Martha's to Bisley Camp, a distance of nine miles or thereabouts. The messages sent were read and replied to, the Morse code being used. The signallers in camp used Steward's limelight signalling apparatus, and it was quite a revelation to the younger members of our party how marvellously brilliant this light was at such a distance.

* * * * *

Another attraction in camp was the fine display of optical goods, photographic apparatus, and the meteorological instruments, including a very fine anemometer on a tall pole, with apparatus for recording the strength of the wind, erected for the fortnight by J. H. Steward, in front of his marquee, which formed an imposing corner to the bazaar, while the side was continued by the marquees of Gregory & Co., who had a large collection of very fine navy and army photographs, Messrs. Fry, of Brighton, with their technically perfect groups of prize-winners and celebrities connected with rifle-shooting, and Mappin & Webb, with an excellent selection of plate and fancy goods for prizes.

* * * * *

There was one thing I should have liked to have seen attempted, and the day was such that I think it would have succeeded, notwithstanding it was somewhat late in the afternoon, and that was the cinematographing of the triumphant procession of the Queen's Prize-winner, Private Ward, of Devonshire. Plenty of photographs of the winner, both posed and on the move, were taken, and some have already appeared; but, for those who have not seen this sight, I think a "moving picture" of the event would have been most interesting. I am rather in the position of the old lady who had seen the Lord Mayor's Show "hundreds of times," for it is twenty-seven or twenty-eight years ago since I first saw a Queen's Prizeman carried in triumph, and I have missed very few in the interval. Then it was a rough-and-tumble carry on the shoulders of the men, now it is a comfortable ride in a luxurious armchair fixed to long poles for easy carriage on the shoulders of comrades and enthusiastic shooting men.

* * * * *

Cinematographs are still receiving Royal favour, for not only has special permission been given for nearly all the Jubilee functions to be photographed, but the Prince of Wales has engaged the Biograph for the special edification of his illustrious visitors after dinner, and, besides, has patronised the exhibitions of the Jubilee and other animated photographs at the music halls. When the requirements for this class of work are better known, the little difficulty in making and developing long films will disappear and apparatus will improve, so that next lantern season should see a good demand for apparatus of the animatograph type.

* * * * *

It is curious to read the sensational writing about a novelty in apparatus or mechanism that some papers can manage to print, and I am forcibly reminded of this, first, by a French paper's description

of "visions of art," and, secondly, by a London daily's description of the new monotype machine. In the first place, a simple modification of our old friend, the aphengescope, is magnified into a wonderful apparatus, and in the latter it is called "A Demon Machine —eats paper and lays type."

* * * * *

Regarding the "visions of art," the French paper says, "Is this a new school being founded?" and, after describing how from a frame containing a transparent screen, or, as they put it, a translucent tissue, a light gradually appears, and, little by little, a figure in colour appears, and "gradually abandons its marmorean attitude, and grows animated, the eyelids move, the hands are raised, and the breast heaves as in real life." It will probably be remembered I referred to "visions of art" in some previous Mems., and explained how, by concentrating powerful lights on a figure, and having a projecting lens and reversing prism, an image was formed on a transparent screen.

* * * * *

Personally I think this a roundabout way of doing the living-picture business, and in a far less satisfactory manner than that to which we have become familiar at the Theatre of Varieties, for, in the new attempt at "visions," the loss of light is considerable, and the image necessarily faint, while, in the original plan, the "pictures" can be seen by thousands, and the subject is thoroughly well lighted, and the accessories made to harmonise with or relieve the figure or group.

* * * * *

There is, no doubt, room for a new arrangement, which I should suggest should be called a physioscope, and phizoscope where a clever actor or actress can be seen making facial changes or representing known characters, but of a size that shall be seen in the largest hall, and, I think, with a special arrangement, and by an outlay that should not be considered prohibitory, the affair could be carried out and would be commercially successful. Visions of art, even with many powerful arc lamps to illuminate the subject, did not, as I saw them, give results that would be self-advertising. G. R. Baker.

ON SOME COMBINATIONS OF LANTERN AND CINEMATOGRAPH.

A living photograph show as an entertainment is a very good thing, but it has its disadvantages. The instrument—now by almost common consent called the cinematograph, for to learn the peculiar individual name of each machine is beyond the power of mortal man—is generally expensive to begin with, and the films too—the animated pictures—represent a matter of over three pounds each, and they are by no means everlasting. The amount of light required is many times that which would be ample for an ordinary lantern show, and, owing to the somewhat complex nature of the manipulations inseparably associated with this form of entertainment, it is almost essential to a fair prospect of success that there should be two skilled operators in attendance.

But it is not with the drawbacks to cinematograph entertainments from the provider and producer's point of view that I would wish to deal, but rather with a few of its inconsistencies as observable by the audience, and with some of the methods that have been from time to time adopted to improve them.

I have already pointed out in a previous article some of the objections that may be raised to that want of continuity that is generally to be noticed in connexion with this class of entertainment. Attention was called to the disagreeable effect invariably produced in the minds of the audience when, at the conclusion of the run of a cinematograph picture through the instrument, they are left in total darkness while a new one is being prepared. Some operators join all the pictures constituting the evening's entertainment consecutively together in one continuous length, which is then wound upon one spool. By this means there is but a very brief interval between any one picture and the next. It is a good plan where it is practicable, but the exigencies of many of the machines on the market are such that it is not often so. Besides, if an encore of one particular subject be demanded or anything should go wrong with one portion of a picture—and accidents will happen in the best regulated cinematographs—so that it becomes desirable to skip to the next picture, the disadvantages of the plan make themselves painfully apparent. Besides, unless the living photographs are to constitute only one short item in a miscellaneous programme, it is rarely that the operator is desirous of hurrying his pictures through with the shortest possible interval between them. Rather is it his wish, generally, to put in a reasonable amount of "padding," in order that his usually limited number of films shall cover a fair length of time.

There is no need to dwell upon the disadvantages of other methods of filling up the interval between one picture and the next; to point out the undesirability of turning up the lights of the hall between every subject and of other subterfuges of a similar nature. In the previous article the remarks were devoted solely to the electric light and to a convenient and simple method of economically working an ordinary electric lantern in the intervals between the animated pictures, and it then seemed to me that a brief review of some of the other methods that have been called into use to accomplish the same object might not be uninteresting to the readers of The Lantern Record.

One of the first ideas to suggest themselves is naturally the employment of a secondary lantern in order to project upon the screen, in the intervals, either an ordinary lantern transparency or a slide giving the title of the next living picture. Certainly there can be no better plan for filling up the interval between the workings of the cinematograph than by the exhibition of ordinary lantern pictures by means of a second lantern. A convenient arrangement is that supplied, I believe, by Messrs. Wrench, in which the apparatus takes the form of a biunial lantern. The upper portion of this instrument is precisely the same as the upper lantern of any limelight biunial, while in the lower the lantern front is removed and the cinematograph placed in its stead. As will be seen, the living picture may be either dissolved into the stationary one near the conclusion of its run, or the change may be made quickly at the discretion or taste of the operator.

But a complete secondary lantern is not a necessity, and in many modern instruments—a couple of months will make the difference between "ancient" and "modern" in connexion with this curious industry, be it noted—the same source of light and the same condenser are made to serve the purposes of the secondary projector. There are various ways of accomplishing this result. In the instrument designed a short time ago by Mr. Birt Acres I think, there is a very ingenious plan by which the desired result is brought about. I believe the following description to be approximately correct, although I have but a vague remembrance of the device, and cannot therefore pretend to speak with the least approach to accuracy. As far as my memory serves, the convergent beam of light, as it leaves the condenser, is parallelised by an optical arrangement specially designed to that end. The parallel beam thus formed then passes *across*—*i.e.*, at right angles to the axes of—both the cinematogaaph apparatus and the secondary projector, which are arranged side by side like an old-fashioned dissolving view lantern. It should be said that the ordinary lantern part of this apparatus is of diminutive size, so as to pair with the cinematograph portion, and the parallel beam of light passes just behind that portion of each in turn where the transparency to be projected is placed. At each of these points there is a silvered mirror placed at an angle of 45°, the one behind the cinematograph film being fixed upon a hinge, so that it can be thrown out of position entirely when required. Let us suppose, however, that it is in its place. The parallel beam of light will thus be deflected at this point into a secondary condenser, which has the effect of giving it the necessary convergency, and thence through the film to the objective, by which the image of the latter is projected on the screen.

After the film has been run through the machine—or, rather, when the operator has just arrived at the last few pictures upon it—he touches a little lever, which throws the mirror out of position. The parallel beam of light is then free to travel on past the cinematograph portion of the apparatus until it reaches the second mirror. Here it meets with precisely the same treatment as it would have received at the first reflector; it is diverted into the second half of the condenser, by which it is made convergent, and then it goes through the title slide and thence to the front lens, which throws the picture upon the screen. The change from the living to the still view is, of course, as nearly instantaneous as may be.

Then, there is another form of instrument by which a similar result is brought about. In this machine—which is made, I believe, by Ottway & Son, of Clerkenwell—there is a vertical attachment to the lantern portion, by which the stationary pictures are projected with the aid of a couple of plane reflectors when the cinematograph is out of use, or what time the films are being changed or otherwise manipulated. This arrangement has the advantage that, when the animated portion of the instrument is in use, the rays of light pass directly through it without

terference in any way, save that which is of necessity involved in ulfilling the unavoidable optical and mechanical requirements of the rojection machine. This is an advantage, for the nature of these inematographs is such that there is never any light to spare, and it is pity that any should be lost by filtration through any unnecessary enses or reflection in mirrors. At the same time, when the ordinary antern picture is being projected, there is nothing to be said against a mall loss of light by reflection or absorption, for the optical arrangement s so much simpler, the transparency so much more transparent, and, noreover, there is no intermittent shutter to cut off half or more of the ight, that there is plenty of illumination to spare.

Indeed, it is rather an advantage that some of the light should be prevented from reaching the screen when the ordinary lantern portion of a compound projector of this description is in use, for otherwise the lantern view will appear upon the screen so much more brilliantly lighted than the cinematograph picture, which is the chief *raison-d'être* of the performance, that the latter must inevitably suffer by comparison.

Another method by which ordinary lantern pictures are projected on the screen during the intervals between the animated representations by the use of the same light and condenser as is used for the latter might be described as the displacement method. According to this plan, the whole of the cinematograph mechanism, together with its objective lens, is displaced from the front of the instrument, and an ordinary lantern front substituted while a lantern transparency is inserted in the slide stage. There are two chief ways of accomplishing this transformation. In one instance the cinematograph mechanism, complete with its front lens, is mounted on a sliding board having motion transverse to the optical axis of the instrument. By its side is also mounted the front lens of the lantern proper. As soon as the cinematograph film is approaching its end, this sliding board is moved across the base on which it is, together with the rest of the apparatus, mounted, and the living photograph machinery is thrown out of the field of action, and its place is taken by the ordinary lantern front.

In the other case the two portions composing the compound instrument, instead of being mounted side by side on a sliding board, are placed at an angle to one another on a board which is pivoted on the base. This is the plan that I have adopted in my own practice, and it has proved entirely satisfactory.

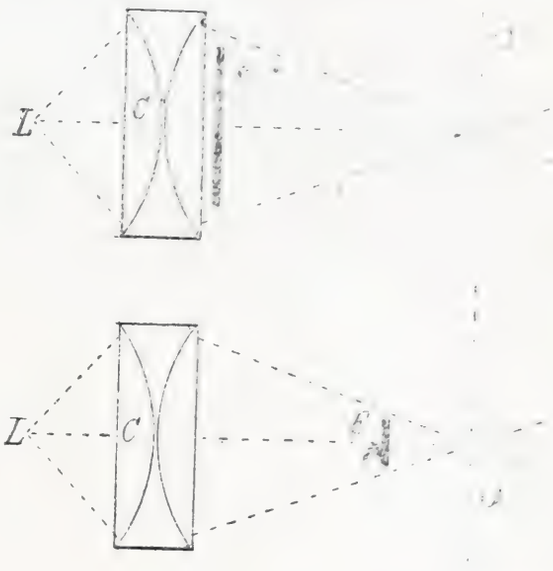
It will be seen that most of these dodges are of such a character that a lanternist or cinematograph operator—whichever he may please to be called—can himself apply to his instruments. Indeed, it was with that idea in view that these few notes have been collected together. But there is one important point that must be continually borne in mind when attempting to make a combination lantern and cinematograph upon the lines suggested by the foregoing; and, that is that the focus of the lantern objective and of that which is attached to the cinematograph must be such that when a change is made, in the course of an entertainment, from one optical system to the other, it will not necessitate a readjustment of the light in the lantern body.

It is hardly necessary to call attention to the fact that in any optical lantern system the rays of light are brought to a focus by the condenser upon the centre of the objective lens. Every lanternist knows from his own experience that this condition must be maintained or it is impossible to secure a clear disc upon the screen. But, on the other hand, the front lens must be distant from the lantern slide by the amount of its own focal length—more or less—or the picture cannot be focussed upon the sheet. In the same way the very much shorter-focussed front of the cinematograph must be separated from its transparency, the film, by a distance roughly equivalent to that short focus, or the film cannot be focussed upon the sheet. Once more, the field of the cinematograph where the film is placed must be set at such a distance from the condenser that it intersects the cone of light therefrom at the most favourable point, so that all the available light will pass through the film and yet be equally distributed over its surface.

Here, then, is a set of conditions which must be reconciled to one another if the combination of lantern and cinematograph is to operate successfully.

I have prepared a couple of diagrams which, I think, put the whole matter in a nutshell, but I must state at once that I know nothing whatever of lenses and optics, and my knowledge of mathematics is exceedingly rudimentary. The little theory, if it can be so called, which is embodied in the diagrams, is one which appears to me to meet the case, and it, at all events, has the merit of being fully borne out in practice.

The upper diagram represents the optical system of a lantern as arranged for ordinary lantern-slide projection in the manner that is familiar to all. L is the source of light, lime or electric as the case may be; C the condenser, and S the slide to be projected by the front lens, which is placed at the position shown by the vertical dotted line, O O. The lower diagram, which, it will be seen, bears a strong family resemblance to the other, represents the same optical system modified to suit the exigencies of the cinematograph. The only alteration, as will be seen, is that the slide, S, is no longer there, but in its stead, though in a



different position, is the little film picture, F; also the objective in the former case is one that has a focal length equal to S, O, while in the latter the front lens is of much shorter focus, namely, a length equal to the distance, F, O. Now, let us take the case of the cinematograph first, for it is the fashion to make the lantern portion of the combination quite subservient to that, so strongly have the living photographs "caught on." The film picture—as everybody knows—measures, approximately, one inch across. The cinematograph is fitted with a 2-inch front lens, in order to give a moderately large picture at a moderately short distance. Consequently, the objective is separated from the film by a distance of 2 inches, roughly speaking. Query, What is the correct distance behind the film at which to place the condenser? When making my own apparatus and this and other similar questions presented themselves in due course, I applied the following rule-of-thumb reasoning. The result was a complete success, but I dare not hold that my reasoning was correct on that account. I merely give it for what it is worth, trusting it may prove to work as well in other hands as it did in mine.

Since the film, F, is 1 inch in diameter, and it must be placed at the smallest possible point of a cone whose apex is the objective, O, and whose base is 3 inches in diameter—the available diameter of the condenser—it follows that that base must be 4 inches behind the film, F, or 6 inches behind the apex or objective, O. Because the base, C, is three times the diameter of the film, F, it must be three times the distance from the apex. In reality the condenser is 4 inches in diameter, but, by treating it as one of 3 inches, a safe margin is allowed for those coloured rays that are always formed by the best regulated condenser, but are not desirable to be included in the projected picture.

Now for the lantern arrangement. It is merely necessary to treat the slides as the base of the cone—as is natural, since it would be placed close up to a 4-inch condenser—and then it will be seen that the correct position for the front lens, in order that the rays from the condenser shall be focussed upon it without any alteration in the distance of the source of light, is 6 inches in front of the slide, or precisely the same position as that previously occupied by the cinematograph lens. Therefore the lantern lens must be one of 6-inch focus. Now, the available diameter of an ordinary lantern slide being 3 inches, or three times that of a cinematograph picture, in order that its projected image shall be the same size as that from the cinematograph, the front lens must be three times the focal length of that in the latter instrument, which is 6 inches again.

It will be found that this reasoning can be applied to any focal length of lens, and by its aid I, at least, have found that the difficulties have disappeared, which before seemed so troublesome, in connexion with the combination of a cinematograph with an ordinary projection lantern in the one instrument.

C. M. Hepworth.

LIGHT-HOUSE ILLUMINANTS, 1887-1897.

[Abstracted from Nature.]

THE *lantern* which crowns the tower and protects the apparatus of a land or rock lighthouse has been materially improved in its construction. The perfect lantern is of adequate area to contain the light and accessory parts, and afford convenient space for service. Its diameter for a sea light is rather fourteen feet than twelve feet. It is of circular form throughout, having a cast-iron pedestal of sufficient height to carry an inside and an outside gallery for cleaning purposes. The framing is of gun-metal or wrought iron. The half-inch plate glass of the purest quality, while resisting wind and weather to a great extent, intercepts the least possible light from the lenses. There is provided abundant ventilation to sustain the central lamp and refresh the keepers. The best contribution of the Trinity House to the structure has been the large cylindric ventilator on the double copper dome, by which the last-named advantage is mainly secured.

Turning to the optical features of the decade, let us see what changes have affected the two main factors of illumination—the fixed light and the revolving light. The ever-increasing number of ships and ports, and the sustained demand for greater and greater speed of vessels, and for sea signals that shall serve more and more to meet all conditions of weather and to discriminate harbours and channels of approach, have stimulated the efforts of light-house engineers in the two directions of power and distinctiveness.

The *characteristics* introduced of late years have been confined for the most part to new combinations and periods of group flashes, or of single equal flashes. Mixed lights of fixed and revolving sections, and therefore with unequal degrees of visibility, are no longer in good repute, although, in the French service especially, they are still retained. Colour also is being gradually abandoned for sea lights. For harbour lights, however, it is still freely resorted to, most of all in Northern Europe, as in the Omo light, Baltic Sea, where in one small apparatus there are no fewer than six characteristics with seventeen variations.

Power has been sought—

(1) By the substitution, wherever practicable, of annular for cylindric lenses, or of revolving for fixed sections.

(2) By the longer focal distance and larger condensing surface of these lenses, and by superposing them in vertical series.

(3) By using an illuminant of maximum intensity, whether oil, gas, or electricity.

(4) By certain variations and extensions of the Fresnel refractors, giving a higher coefficient of beam.

(5) By invoking the principle of the full perception of the light from an annular lens moving in rapid rotation with very short intervals between the flashes. This is known as the *feu éclair*.

(6) By rotating an opaque screen around a lamp, or by raising and lowering quickly an opaque cylinder, or by cutting off and relighting of gas in rapid alternation.

Let us consider these in order.

(1) The reasons for the disuse of fixed sea lights, except in the case of marking or intensifying particular sectors, are chiefly their want of power to penetrate to their natural horizon, and the increasing number of bright fixed lights on ships and on shore, which may in certain conditions lead a navigator into danger from the difficulty of distinguishing them from a light-house. The flashing light, with its superior power and numerous possible distinctions, is the best safeguard against this.

(2) The hyper-radial lens of 1330 millimetres focal distance, first suggested (as Prof. Tyndall declared) by Mr. John Wigham, and concurrently at least by Mr. Thomas Stevenson, who less fitly termed it hyper-*radiant* (a good name for the ten-wick oil flame, or ten-ring gas flame), has quite justified the expectation of lighthouse engineers as a convenient and powerful instrument admirably adapted to the large burners now employed. This lens, like its predecessor of 920 millimetres radius, is commonly used without catadioptric prisms, as in the Spurn Point light. The disuse of prisms effects a great saving in cost at but an inconsiderable diminution of power where a high vertical angle of refraction is adopted. Yet it must be admitted that this is at the expense of symmetry and elegance. The French light on Cape d'Antifer is a fine example of the hyper-radial system, embracing a full complement of prisms.

There has also been constructed, at Mr. Wigham's suggestion, as an experiment, what he aptly calls a giant lens of 2000 millimetres radius, but it is not yet adopted in practice.

The superposition of lens lights each with its own burner, is an obvious means of gaining power, and it is remarkable that, although first suggested in 1859, it was not practically utilised with dioptric apparatus until 1872. Whether biform, triform, or quadriform arrangements be resorted to, the advantage of concentrating or reducing the intensity of the beam according to atmospheric variations is inestimable, and the adaptation reflects undoubted credit on Mr. John Wigham, whose poly-annular gas-burner on a like plan had been already approved. The triform Tory Island light, fitted with these burners, and variable in power from 17,500 to 326,500 candles, may be cited in illustration.

(3) The maximum intensity of an illuminant must still be sought in the electric arc. Gas and oil remain substantially equal compared in lamps of the same size and sort, the superior applicability of each being determined by local conditions. In Ireland the Wigham expanding burners give a marked prominence to the gas, which is copiously used in them. In England and Scotland mineral oil is preferred, its quality being carefully maintained at the highest standard. The old disability of this illuminant, the risk of explosion, has been almost nullified by the production of a petroleum whose flashing point is 230°, and long experience has confirmed its great value. On the other hand, the gas called "incandescent" has been introduced, the best form of it being of the Auer-Welsbach type. The brilliancy of this gas is perhaps only second to that of the electric arc, but the perishable character of its accessories exacts great caution in using it, and it has not as yet been employed in any sea light in this country, although it is already so adopted in France. A mixture of oxygen and coal gas, and one of oxygen and oil vapour, which have been tried in street lamps and otherwise, have been recommended for light-houses, but not hitherto accepted.

Electricity has been, as it were, on its trial since the South Foreland experiments of 1885, and the evidence affecting it is hardly yet complete enough to justify a final verdict. The result established at the South Foreland was that the electric light is the most powerful under all conditions of weather, and has the greatest penetrative intensity in fog. The Committee of the Royal Society, which examined in 1890 this report of the Trinity House, found that the experiments did really justify the results given.

The twelve years that have elapsed since the trials at the South Foreland have, on the whole, tended to qualify the conclusion as to the penetrative power in fog. Three lights—two of the group-flashing, and one of the single-flashing character—constructed by Messrs. Chance, may be cited on this point. The triple flash of the Tino light (near Spezia) has been unmistakably discerned in rain and fog at a distance of more than twenty miles. On the other hand, the Isle of May light has been invisible, in a thick atmosphere not amounting to fog, at a distance of twelve miles, and in a dense fog at half a mile; and the St. Catherine's light was equally invisible to the *Eider* before she grounded on the Atherfield ledges. It has been, indeed, asserted that the St. Catherine's has often been unseen at a quarter of a mile distance.

The truth appears to be that the electric light is very sensitive to atmospheric conditions, which are so many and so various, and that in thick weather it parts with its power in a much greater ratio than does a gas light, or even an oil light. There is a degree of fog which quenches the sun, while the large luminous surfaces of the superposed gas lenses project on the fog a reddish colouration, and the fog itself thus becomes a signal to the mariner when, as it were, in the words of Persius, "pinguem nebulam vomuere lucernæ." It would be most dangerous, however, for the mariner in a fog to approach the coast presuming on this quality of a light in whose vicinity he supposed himself to be. The lead, the anchor, the horn should be his trust till the veil lifts, and the electric beam shines out in full splendour.

There has occurred no important change in the *burners* of sea lights. The Trinity House improved six-wick, or rather five-wick, remains, if not the largest, the best working oil burner, with a power of 800 candles. This is used generally for lights of the first and second order, while the four-wick, with a power of 360, is used for third order lights, and the eight-wick, of 1200 candles, for hyper-radial lights. The lamp is of the "pump" or the "pressure" type, and contains from 10 to 100 gallons of oil. It is probable that, owing to considerations of space and economy, the gravity system may again be resorted to with enlarged reservoirs seated on the lantern roof. The electric arc is used with carbons of from 15 mm. to 65 mm. diameter, and currents of from 50 to 400 ampères. The incandescent filament is not found equally appropriate. The luminous intensities obtained from the arc range from five to fifty thousand candles. Both direct and alternating machines are employed. The installations at St. Catherine's and the Isle of May are of the most complete character, and do honour to the distinguished engineers of the Trinity House and the Northern Commissioners.

It may be mentioned that, for positions difficult of access, lamps having special wicks and reservoirs for oil or gas, capable of burning from ten to thirty days, are now in use, though, of course, these are only available for small isolated lights.

(4) The improvements since 1887 in dioptric lights are few, and, with one exception, are of no striking importance. The great invention of Fresnel, perfected by the beautiful holophotal arrangements of Stevenson, has remained the cardinal principle of all modern lights of the lenticular type. But the inevitable tendency to modify and improve has resulted in several proposals of more or less merit. Mr. Alan Brebner had, in 1882, submitted an ingenious plan for producing vertical and azimuthal condensation, by single agency in cases where straight prisms placed outside the main apparatus had been employed to intensify one or more sea sectors. This method, however, has been seldom, if at all, adopted. Again, Mr. Brebner, in 1884, had recommended a plan of dipping a portion of the beam to some intermediate distance between the light-house and the horizon, to meet the case of a fog which the strongest beam can only very partially penetrate. This, or some analogous plan has been tried, but has not prevailed. The advantage of withholding from the horizon a substantial part of the beam, and deflecting it any where, is extremely doubtful. The depth and direction of a fog are always uncertain elements. The light-house may be surrounded by it while the

ffing is clear, or *vice versâ*. And it would be in equal measure mischievous to encourage the mariner to stand in, looking for a signal which he might never see, or see too late, and to intrust the light-keeper with the power to deflect the light according to his own judgment. In 1892, Mr. Charles A. Stevenson published in *Nature* an account of his spherical and equiangular refractors, which remedy a certain loss of emergent light in the Fresnel refractors. In 1894, Mr. Stevenson further developed his design, claiming for it, within practical limits, an advantage of at least ten per cent. in increase of light as compared with the Fresnel lens. The improved refractors have been adopted with success in several of the Scottish light-houses. In 1895 and 1896, Mr. John A. Purves contributed an able mathematical analysis of equiangular prisms, and a new form of spherical central lens called the Inverse Refractor (the facets of the lens turned inwards), to be used in connexion with Mr. C. Stevenson's equiangular prisms. Messrs. Chance have raised the Fresnel lens from 57° vertical to 80°, using glass of the same refractive index, and this angle has been adopted by the Trinity House with great advantage.

(5) The one exception referred to in regard to the minor improvements of optical apparatus since 1887 is the "lightning light," an adaptation of serious importance which has attracted the attention of light-house engineers in nearly all maritime countries. The shortening of the interval between the flashes of a revolving light, so that the mariner, especially when in a fast liner, may have more speedy cognisance of the signal that guides him, has become a plain necessity, and led to the gradual reduction of the period from 60, 45, and 30 seconds, to 20, 15, 10, and even 5 seconds, reducing proportionately the duration of the flash. So far the principle of the *feu éclair* has been approached. But much more than this is demanded. No one has advocated more strenuously than Lord Kelvin, himself a sailor and a benefactor of sailors, the acceleration of revolving lights. No one has laid it down more clearly that one-ninth or one-tenth of a second is sufficient for the eye to receive the full lustre of a lens passing it. Any longer duration is a loss of time, and therefore of intensity. German and French physiologists have confirmed this, and it is the principle on which the *feu éclair* system is based. In its application, then, if for any "order" of light the maximum of power be desired, the largest available lens in vertical and horizontal angle, combined with a totally reflecting mirror and a central flame of adequate dimensions, must be adopted. If two or more lenses be used, singly or grouped, the intensity of each flash is proportionately less, the interval of time, say five seconds, between the single flashes or the groups of flashes, being the same as where there is only one lens. In this manner the greatest intensity and the shortest interval are secured, and the characteristic as presented to the mariner seems theoretically perfect. The first general introduction of the "lightning light" is due to M. Bourdelles, the chief of the French Light-house Administration, under whose auspices several light-houses on the coasts of France have already been endowed with it. In England Messrs. Chance have constructed, in 1895, for Cape Leeuwin, Western Australia, a "bivalve" apparatus of the first order, with an experimental duration of beam of one-fifth of a second, and they have placed, this year, in the Exhibition of the Imperial Institute, a "univalve," or one-lens apparatus of the third order. Both these lights are on the *feu éclair* system.

Successful as this system appears to be, it should for the present be regarded as on its trial, and as awaiting the collective judgment of mariners on certain points. And meanwhile it should be estimated as supplementing, not displacing, the well-tried forms of apparatus at the disposal of the light-house engineer.

Investigations into the amount of light reflected and transmitted by certain kinds of glass—light-house glass among the rest—have been most ably conducted by Sir John Conroy, Bart., at Oxford, in 1888. He traversed by newer methods, and with surer results, the ground of many observers, from Augustin Fresnel to Lord Rayleigh; and he demonstrated that "the values of the transmission coefficients for light of mean refrangibility show that for 1 centimetre the loss by obstruction amounts to 2·62 per cent. with crown glass, and 1·15 with flint glass." The refractive index of light-house glass lying between 1·52 and 1·54, the loss may thus be practically taken as $2\frac{1}{2}$ per cent. for 10 millimetres of thickness.

The intensities of light-house apparatus have of late been diligently considered by light-house authorities with the view of determining, once for all, the relatives values of the six orders of lights, and of the lamps appropriate to them, and also of publishing the results in the Admiralty Light-list. A large amount of uncertainty and misconception seems to have prevailed on this question. M. Allard, in 1876, in a celebrated memoir, gave an elaborate exposition of the whole subject; but his conclusions, always tending to excess, have not been accepted by more recent investigators.

Other estimates, official as well as private, and more or less discordant, have from time to time appeared, both in this country and France. The factors of evaluation, such as radius, lens surface, vertical section, flame, reduction for losses, &c., have been combined in different ways by different persons, and some of their conclusions must be regarded as merely empirical; but in 1891 and 1892 a serious attempt was made by a committee of the chief engineers of the three Light-house Boards to compile an accurate schedule of intensities with photometry as a basis. Taken as a whole, the values arrived at are fairly acceptable, not certainly erring on the side of excess.

But as yet only the lights with oil or gas for illuminants have been determined.

Electricity appears even more difficult to deal with, and no intensities have been assigned officially to any of the electric lights in the British Islands.

J. Kenward.

THE CARBIDE OF CALCIUM REGULATIONS.

Owing to its high illuminating power, and to the economy of its production, the development of acetylene gas from the experimental and laboratory stage into an important and growing industry has proceeded with remarkable rapidity. Properly used, its illuminating power is from fifteen to twenty times greater than that of ordinary gas, whilst one pound of carbide of calcium, which is its base, will yield five cubic feet of acetylene gas. It is with reference to this base that we now have a few remarks to offer, says *Invention*, which we may appropriately preface by a brief statement respecting its manufacture. When a mixture of powdered lime and carbon is introduced into a specially constructed electric furnace, the mixture, at the enormous temperature of the electric arc, is fused. The fused mass, when cooled, is a dark crystalline, extremely hard, and heavy substance, known variously as carbide of calcium, calcium carbide, or calcic carbide. We prefer the first designation. By the addition of water to carbide of calcium, acetylene gas is formed, which gas, as already stated, possesses remarkable light-giving properties. Another special advantage of this gas is that it does not require skilled labour in its manufacture. All that is necessary is to put a given quantity of carbide of calcium into a generating apparatus, and decompose it with water. The carbide is converted by this decomposition into a residue of slacked lime, which is removed from the generator through an outlet. Naturally a reasonable amount of care has to be observed in its manufacture, but by observing the necessary precautions there is no more danger than with coal gas. In view of the growing importance of the manufacture and use of carbide of calcium for illuminating purposes, it has been considered desirable by the Home Office authorities to promulgate certain regulations with regard to its sale and storage. These regulations were formally specified in an Order in Council in February last, and it is to these we desire to direct attention.

The regulations are mainly founded upon the Petroleum Acts, 1871 to 1881, and it is now necessary for nearly all users of carbide of calcium to obtain from the local authorities a licence to store it under the Petroleum Acts. Practically the same duties are imposed upon dealers in carbide of calcium as are already imposed upon dealers in petroleum. Amongst others who have interested themselves largely in the matter of these regulations is the Acetylene Illuminating Company, of 63, Queen Victoria-street, London, their works being at the Falls of Foyers. They have been manufacturing carbide of calcium in this country since the spring of 1895, and they have now wrought a good work in preparing and issuing a pamphlet on the matter under consideration. This pamphlet should be in the hands of every local authority, as it contains an abstract of both the Petroleum Acts and the regulations of the London County Council applicable to the storage of carbide of calcium. In the preparation of this pamphlet the Company have been for months past in correspondence with the Home Office authorities, who showed themselves anxious to take such measures as would ensure safety in the use of carbide of calcium without hampering the industry.

As manufacturers of carbide of calcium, with a large capital engaged in the business, the Company are justified in expressing the opinion that, with the intelligent interpretation of the Petroleum Acts by the various local and other authorities, the legislative restrictions (with a few necessary modifications) will not prove a hardship, and we entirely go with them in preferring to see this new industry placed on a fairly well-defined, instead of on an uncertain, basis. The whole of the Petroleum Acts apply to carbide of calcium in the same way as if it were petroleum, with, however, a few slight exceptions. Under the Order in Council, every user of carbide of calcium, in however small a quantity, was obliged to have a licence. This was a hardship to small users, but the restriction has been removed, inasmuch as an Order in Council has been made under which five pounds of carbide may be kept without a licence, provided it be stored in separate substantial hermetically-closed metal vessels containing not more than one pound each. The London County Council has issued an abstract, from which we learn that any dealer in apparatus, who has himself obtained a licence, is allowed to keep a certain number of blank and stamped forms, which he may deliver to his customers, who are private users, on the latter signing the form of application for licence, which the dealer will send to the authorities. Once granted, however, a licence should not require renewal every year. Moreover, a smaller fee than five shillings should meet the circumstances; and, as it is optional to all local authorities to make any regulations they think fit as to the conditions under which licences should be granted, doubtless this question will be dealt with in a very broad spirit.

With regard to the danger of explosion, we may point out that carbide of calcium is not in itself an explosive, and cannot be made to explode,

even if exposed to the highest degree of heat. When, however, water is added to it, as already observed, or if it be kept exposed in a damp atmosphere, carbide of calcium is attacked, and acetylene gas is evolved. But even with unpacked carbide of calcium in a damp atmosphere the evolution is slow, as a hydrate of lime forms on the carbide and protects it, to a great extent, from atmospheric influence. If gas be evolved, and allowed to accumulate, and a light be applied, it will, of course, fire and explode in the same way as coal gas; but its escape is easily detected owing to its pungent odour. Safety, however, depends upon this material being treated as dangerous, and not as being perfectly safe, a precaution constantly insisted on, put persistently neglected in regard to explosive compounds. Now, with carbide of calcium, properly packed, and with proper precautions in storage and use, there is absolutely no danger; and, when we say "properly packed," we may instance the way in which it is packed by the Acetylene Illuminating Company, namely, in strong air-tight and damp-proof metallic drums. The packages, however, must be kept in a dry, well-ventilated place, and it is a wise suggestion that, like any material requiring caution in its use, it should not be stored in any dwelling-house unless in small quantities and under lock and key.

A few words as to the manufacture and use of acetylene gas. This is a question of grave importance, and one upon which the Petroleum Acts are silent. It is well known that these Acts only apply to the carriage and storage of the product, no provision being made as to the nature of the lamps in which it is burnt. This is an unfortunate omission, as testified by the number of accidents, many of them fatal, arising from the use of petroleum in unsafe appliances. The Home Office authorities naturally wish to avoid danger in the use of acetylene gas, and recommend that no apparatus should be used unless certified safe by a competent authority. This course is one which, to our personal knowledge, the Acetylene Illuminating Company has, from the first, recommended.

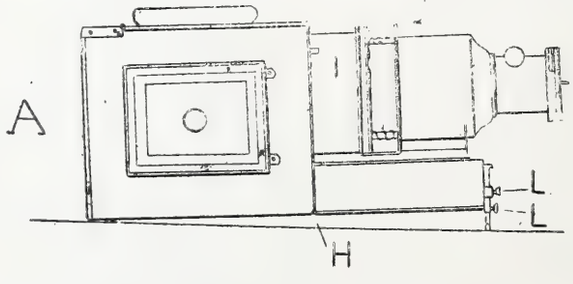
BUTCHER'S IMPROVED LANTERN.

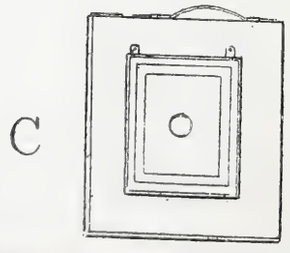
Messrs. Butcher's invention includes two objects, viz :—

1. To produce a convenient and practical instrument that will shut up into the smallest possible space.

2. To provide an arrangement attached to the front of the lantern, by means of which the same may be raised off its stand and adjusted in various positions, throwing the picture in an upward direction as required by the operator. The objects of this invention are carried out as follows:

1. The back half of the lantern, generally called the body, being empty, that is, the limelight jet or other illuminant having been removed, and being made of the same size or just large enough to receive the front half





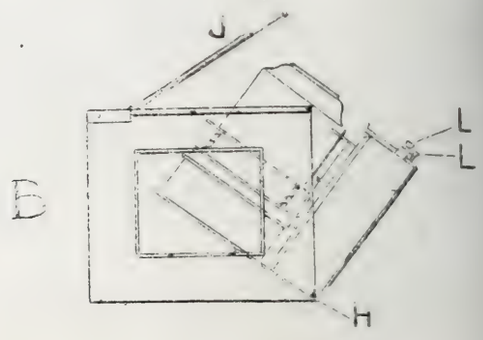
of the lantern, that is, the optical portion, the two halves are hinged at the centre of the base, so that, when the necessary clamping catches are removed, the front portion will fold up upon this hinge and fill the back portion or body, the lid of the body being also hinged to admit the former, and when closed down forming one square box.

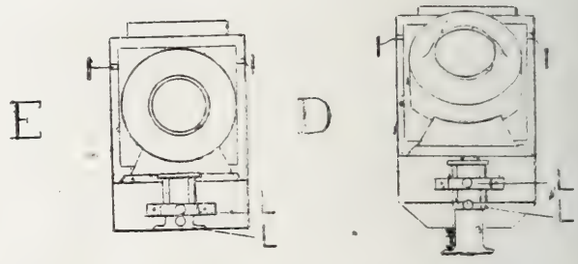
2. On the front of the base of lantern is attached some means by which the ordinary lantern may be tilted upwards and fixed in any desired position. This more particularly applies to the ordinary inexpensive metal body lanterns which are now very largely sold, but the lantern might be in any material. This arrangement is made adjustable, so that, by loosening a thumbscrew, the operator can without trouble adjust the height of his picture as desired.

In order to better understand the methods of this invention, and the means of carrying the same into effect, reference is made to the drawings attached herewith.

A. Shows the general style of this lantern when ready for use; this patent is applicable, however, to any style. H indicates the hinge in base, LL indicates the adjustable tilter, I indicates turnbuttons.

B. Shows the lantern partly closed upon hinge at H. The turn pin at I and the corresponding one on the opposite side having been released,





J is the hinged lid which allows the front portion to fold into the back, and which, when shut down, closes up the whole.

C. Shows the lantern closed up and ready for carrying or packing away.

D. Gives a front view of the tilting arrangement extended as in use, and showing the adjusting screws, LL.

E. Shows the tilting arrangement closed up and ready for packing away.

ACETYLÆNE FOR MILITARY SIGNALLING.

Mr. A. E. Munby writes to *Nature:* In conjunction with Captain J. E. S. Moore, I have been making some experiments on the use of acetylene in signalling lamps. We have obtained such good results with the very primitive apparatus at present employed, the light is so brilliant, and the requirements so portable, that it seems well worth considering whether acetylene could not take the place of the lime light where portability is an object.

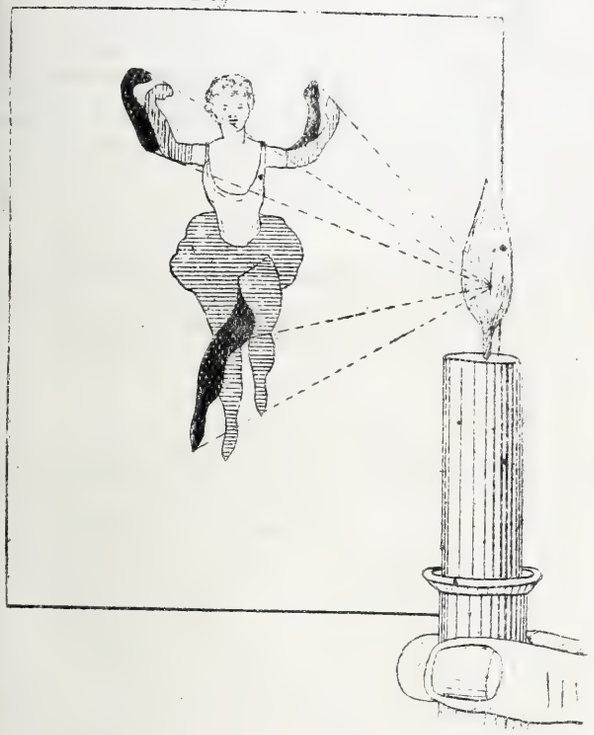
The apparatus consists of a 5-ounce bottle, carrying a two-hole rubber cork; water drips on to the carbide from a wide glass tube, holding some 2½ ounces, and furnished with a connexion of rubber tube and a screw-clamp to act as regulator. The gas escapes from a straight tube to the lamp, being trapped on the way by a wider piece of tube, into which the smaller tubes are corked at either end; this makes a sufficient condenser for any water vapour. The gas tube enters the lamp through the base, and the gas burns from an ordinary 0000 Bray. The generator, when charged, weighs one pound, and after a couple of minutes, during which time the action is a little irregular, will give a steady light for thirty or forty minutes; on more than one occasion, indeed, it has run out without the clamp being touched after first adjustment. We find an ordinary lamp small for the heat produced, and have had to rivet the soldered parts; but increased ventilation would be easy to arrange. Of course, for permanent work, the generator would have to be arranged in metal; even then it would probably be the lightest gas-supplying arrangement, for the illumination, yet produced.

SHOWING, BY SHADOWS ON A SCREEN, OBJECTS APPEARING TO MOVE.

For this purpose Messrs. Garchey and Regny draw, paint, or otherwise mark on a translucent screen those parts of the objects which are not intended to show any movement; and in a plane some distance behind the screen they fix those parts which are intended to have the appearance of movement. By moving the light, the shadows of those parts are caused to move on the screen relatively to the fixed parts. Thus the bodies, or parts of the bodies, of persons or animals may be figured on the screen, while figures of their limbs, or some of them, are placed behind the screen; then, by moving the light to and fro, the shadows of the hinder figures can be made to move on the screen so as

give the appearance of natural movements of the limbs. Fig. 1 of e accompanying drawings represents a translucent front screen having

Fig. 1.



on it a drawing of a figure, except that some of the limbs, which are shown black, are drawn on a screen interposed between the front screen

Fig. 2.



and the light. By moving the light to and fro laterally, the shadows of those limbs are thrown on the screen so as to appear in different attitudes.

The figure may thus be seen, as shown by the white and lightly shaded parts in fig. 1, or as shown in fig. 2, or in intermediate positions, giving the appearance of movement of the limbs.

SUCCESS IN MAKING FLASHLIGHT PHOTOGRAPHS.

Most essays, treating on success in any line of business or profession, ay too much stress upon set rules, and neglect to offer a few suggestions which will enable the reader to develop and perfect his own individuality.

"The secret of success," says Leo D. Weil, in the *Photographic Times*, 'if it may be called by such hidden art, depends not upon *rules*, but upon *individuality*. No matter how bright we are, no matter how quick we can grasp and remember what is told us, it is of little use if we do not become a part of it. We should be so totally absorbed in our undertaking that self is entirely forgotten. Then, and not until then, shall we see the works of a genius.

"How can this individuality be best developed? In the first place, we should understand that the governing power which rules this universe is founded upon a principle, and this principle is good and harmonious. Anything that deviates from this principle is evil or inharmonious. Therefore, in order to keep in perfect harmony all the time, we should hold constantly before our eyes the perfect model. When we once depart from harmony, there is no end to failures.

"This harmony is caused through the association of ideas, or through the relation that one thought bears to another. To illustrate:—For a number of years photographers have been successful in making portraits under the studio light. As a rule, the results have been successful, especially regarding the distribution of light. Now, it happens that magnesium powder, for making portraits by artificial light, is discovered, and we wish to make as good pictures as are made under the studio light. How shall we go at this? Should we strike out blindly and flash here and there, taking our *chances* of succeeding once out of fifty? No, that would be wasteful and unprincipled. We should remember that nothing under the sun is entirely new. The combination of two or more old ideas is the cause of new ideas. Looking at the thought in that light, we can readily see that there is really nothing new. This combination of ideas is what we call the association of ideas. In order to form this association, we must have harmony. In music, every two notes combined will not produce harmony. Here's where the musician's individuality comes in. So it is in anything else; every two ideas combined will not form a new idea. It is necessary, sometimes, to introduce more than two ideas, and there is where *our* individuality comes in. Individuality is the main thing. This we *all* possess in a large degree, but we keep it hidden behind a cloud of evil and discord. The sun is shining all the time. The clouds which occasionally obscure it from our view do not signify that the sun is not shining. So it is with ourselves. If we keep despair and other evils constantly before us, we do not allow our individuality to receive the light of truth, and consequently we are in the dark, knowing not which way to turn. Success will never come in that state of mind. Awake, young genius, the world is awaiting for your cleverest production. You know as well as not that, if you dwell in personality, you shall be blind to the truth. New inventions are caused through relations. Therefore, if we wish to succeed in flashlight photography, we should study all that has been discovered in studio lighting, as these are the results which we wish to attain, or, if possible, better results. If you see something that pleases you in studio lighting, study the source from which it comes. Note carefully how the best effects are produced, and operate the flash on the same principle. Remember, however, that all photographers have not reached the high standard of lighting. Those who nearest approach the old masterpieces in portrait painting are the best models to follow. I think that Mr. Hollinger, of Hollinger & Rocky, comes nearest to this than any photographer I know of. He is not afraid to do what he thinks. There is too much conventionality in studio lighting, and it is best we do not follow too closely in these paths. Do not imitate any one. Combine others' ideas with your own and you will succeed in being what is called original.

"Retouched photographs are, in ninety-nine cases out of a hundred, failures, as to naturalness. The less the retouching, the more artistic the results. Of course this rule cannot be applied to faces that are already 'retouched' when the sitter is being photographed. Such a person can never be made to look natural, because, as yet, we cannot photograph colours. Don't despair, however. There are more people who do not like retouching than who do. So many people have been imposed upon by the so-called 'artist photographers,' who have plenty of money and make a large display for effect; but, when it comes to art, they don't know quite as much as they pretend to.

"The field in non-studio photography is unlimited, and there are hundreds of branches which can be developed separately by the artist, and each branch, if faithfully attended to, is sure to lead to results far surpassing studio work in many respects. At home one feels more natural than the artificial and foreign environments of any studio could possibly produce. The associational value which we place upon our household gods outweighs any interest which can be said in favour of studio work. In this early stage of development of non-studio photography, it might be said that bust pictures can be best produced in the studio, but it is only a question of time when we shall see home portraiture reign supreme. Other means of artificial lighting will be invented and the facilities for working will be simplified. This, of course, depends upon the work of our young geniuses. If each one does his part in his own little territory, it will not take long before we have a crop of good fruit.

"Keep everlastingly before your mind's eye the perfect model or principle, always play for harmony, and, when discord seems to intrude, begin all over again on the train of thought, and keep the association under careful concentration. Our valuable time should not be wasted trying to discover the cause of this discord (or nothing), but we should play right on harmoniously, and results will surely follow."

STRENGTHENING INCANDESCENT MANTLES.

On July 23, in the Queen's Bench, before Mr. Justice Wills, the hearing was concluded of the action, Sunlight Incandescent Gaslight Company *v.* Incandescent Gaslight Company, Limited, and others, which was for an injunction to restrain the defendants from infringing the plaintiffs' letters patent, No. 11,161, of 1886, for improvements relating to the production of light by the incandescence of refractory materials. The defendants denied that they had infringed the patent, and also alleged that the invention was not new or useful.

The plaintiffs' case was that they were the owners of a patent for strengthening mantles and making them more portable. The process adopted by the plaintiffs was to dip the mantle after it had been burnt off into a liquid which thoroughly penetrated the pores of the material. When the liquid was set, a degree of hardness was produced which made the mantle a more or less elastic and transportable body. When the mantle was placed on the burner and lit, the stuff into which it had been dipped burnt off quickly, and left a friable mantle in its place ready for the gas to act upon so as to give the incandescence. The liquid used by the plaintiffs was a solution of paraffin with hydrocarbon. The defendants in their process used collodion instead of paraffin, and this the plaintiffs said was practically the method adopted by them, as set forth in their specification, and was therefore an infringement of their patent. Defendants denied the alleged infringement, and contended that the plaintiffs' patent expired on September 1, 1896, in consequence of their failure to pay the annual fee of 10*l*. They further said that the plaintiffs' mantle was not new nor useful, nor the proper subject for a patent, and that there were differences between the provisional and complete specifications. Plaintiffs, in reply, said the omission to pay the necessary fee in September, 1896, did not prevent them from recovering their royalty of ten per cent. on mantles made prior to that date. They further said that, after the present action had been concluded, they intended to take the necessary steps to remedy the omission.

Mr. Justice Wills, at the conclusion of the evidence, said he could not honestly give to the plaintiffs' patent the wide construction which it was necessary for them to claim in order to succeed in the action. He thought there was an indication in the patent that the patentee meant to limit his invention to substances which he might characterise generally as of the wax or paraffin type. The specification claimed:—1. "The treatment of the mantles after ignition by immersion in a liquid which will afterwards set and will burn away without prejudicial results to the mantles for the purposes set forth. 2. The use of the paraffin substantially as described in the treatment claimed under the first claim." There were two kinds of "setting," one by reduction of temperature and the other by evaporation. The kind of setting which was applicable to collodion (the substance in which the mantles were dipped by the defendants) was effected by evaporation. The key of the plaintiffs' specification was to be found in the words, "other materials may be employed so long as they set hard at ordinary temperatures." What the patentee meant was that materials were to be employed at higher temperatures, which set on arriving at lower temperatures. It followed that the patentee was not entitled to claim any setting except that effected by the operation of cooling, and that, therefore, the use of collodion by the defendants, which was alleged to be an infringement of the patent, was not an infringement. His Lordship further held that the plaintiffs' patent had not been anticipated, and that it was useful, and gave judgment for the defendants upon the issue of infringement and for the plaintiffs upon all the other issues except one, which alleged that the patent expired on September 1, 1896. Defendants to have the general costs of the action. A certificate that the validity of the patent came in question was also granted.

In a memoir presented to the Paris Academy of Sciences by MM. Egoroff and Georgiewsky, it is stated that their experiments show that the luminous intensity of a Bunsen burner always increases under the influence of a magnetic field.

The researches lately published about the supposed new element, "lucium," have induced Professor Chroustchoff to revise the work he had made in 1887 upon what he then supposed to be a new element, "russium," also obtained from the monazite sands of North Carolina. He gives a short report about his first investigations in the *Journal* of the Russian Chemical Society (xxix. 3). Having obtained during the last eight years about twenty-five kgr. of rare earths, he extracted from them thirty-five grammes of a substance which has all the properties of "russium." Its equivalent is equal to 70·5, and its spectrum is characterised by a group of green and violet lines. A detailed description of all the experiments will soon follow. Professor Chroustchoff also mentions that cerium, after it has been freed of all traces of thorium and other impurities, can be separated into several fractions differing from each other by their physical properties, and having, respectively, the atomic weights of 138, 140, 142, 146, and 156·5. It also seems that besides the two components of didymium, described by Auer, there exists a third component. The note contains a list of all the rare earths hitherto obtained or supposed to exist.

The Swiss Intercantonal Congress for regulating the production and use of acetylene has drawn up the following prescriptions, subject to final revision:—Government permission is necessary for erecting and employing plant for making acetylene. The use of liquid acetylene and portable lamps for it is forbidden. Calcium carbide should be stored in separate places, dry and easy to ventilate, into which no light must be taken. Supplies of carbide must not exceed 50 kilos. (1 cwt.). The pressure in the producing chambers, pipes, and receivers, must not exceed 6 centimetres (2·4 in.); and the apparatus must be fitted with pressure gauges, working automatically, for facilitating a check on the pressure. The use of pure copper is forbidden for lighting appliances. The conduct and supervision of the plant is only to be intrusted to persons who can be depended upon and who are conversant with the properties of the gas and the use of the appliances. Each appliance is to bear a prominent notice that unauthorised persons are forbidden to touch it. Penalties are to be imposed for any contravention of the prescriptions.

Before deciding on the system of illumination to be adopted for a new girls' school in Vienna, the authorities invited firms experimentally to fit nine of the schoolrooms with lamps, says the *Trade Journals Review*. This request was responded to, photometric measurements were made, the cost question entered into, and a well-attended conversazione held in the rooms. The *Zeitschrift des Oesterr. Ingenieur und Architekten Vereins* gives a plan of the rooms, with the positions, power, &c., of the lamps, and particulars respecting consumption of gas or electricity, cost of maintenance and installation, &c. The diagrams and tables occupy one page of the journal. A great deal of information is offered in the most condensed state, but more explanatory notes would be desirable. The photometric tests were made after Weber and after Kauer. The committee have come to the conclusion that the lamps, incandescent, electric, or gas lamps, should not be directly seen, but that diffused light should be applied, and that the lamps should be suspended eight and a half feet above the desks, which in the rooms in question means about three and a quarter feet below the ceiling. The installation of the electric lamps was considered cheaper than that of gas lamps, but the incandescent gas lamps would prove more economical to maintain.

Professor Vivian Lewes recently read a paper on *The Theory of the Atmospheric Burner and its Influence upon Incandescent Gas Lighting* in the course of which he remarked that M. Denayrouze had invented a system of lighting which consisted of an adaptation of the well-known incandescent mantle to a novel form of the Bunsen burner. He first produced a burner in which, by thoroughly mixing the air and the gas by means of a small electro-motor, and then passing it on to the point of combustion, he obtained results far exceeding anything that had been done before. However, the provision of the motor was out of the question, and the inventor had discovered a law which enabled him to do away with all moving parts, and yet so secure a perfect admixture of air and gas as to get a light far superior to any of the forms in general use from an equal amount of gas. Chimneys, as they all knew, were unmitigated nuisances. The Denayrouze system did away with chimneys. The light given out was whiter than the one they were accustomed to, and there was not that green tint about it which was so disliked in the household because of the appearance which it gave to ladies' complexions. Again, they would be surprised at the tremendous pull-down in the illuminating power which was brought about by the use of a chimney. He was convinced that in the future they would find the gas managers sending out their coal gas, and at the same time, by utilising coke, make water gas for incandescent lighting in public squares and buildings. By that means they would get a light which would be enormously cheaper than ever electricity could be.

Carbide of Calcium.—In view of the growing importance of the manufacture and the use of carbide of calcium for illuminating purposes it was considered desirable by the State authorities to promulgate certain regulations with regard to its sale and storage, which were formally specified in an Order in Council dated February of this year. The regulations appear to be founded largely upon the Petroleum Acts, 1871 and 1881; but, as the regulations referred to in this connexion might be considered as not sufficiently explicit without further definition, the Acetylene Illuminating Company, manufacturers of carbide of calcium at the Falls of Foyers, have issued a pamphlet containing an abstract of both the Petroleum Acts and the regulations of the London County Council applicable to the storage of carbide of calcium. It is pointed out in the preliminary observations made by the Acetylene Illuminating Company that it is optional for all local authorities to modify the suggestions made by the London County Council in any manner they may think desirable. The Acetylene Illuminating Company states that the Home Office are anxious to avoid any measures which might result in an obstruction to the new industry, at the same time entertaining careful and proper regard for the public safety. By an order in Council of February 26, certain parts of the Petroleum Acts, 1871 to 1881, were applied to carbide of calcium; but, by an order dated July 7, exemption has been extended to quantities not exceeding 5 lbs., when kept in separate substantial hermetically closed metal vessels containing no more than 1 lb. each. It is to be observed that where the carbide of calcium is not kept in such vessels no quantity may be kept without licence.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*September* 3, 1897.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

A contemporary remarks that the latest application of animated photography is interesting. It is to make a series of pictures of famous players in well-known plays, such as Joseph Jefferson in *Rip Van Winkle*, for exhibition in the form of animated photographs, accompanied by an explanation of the play, in the smaller towns not visited by the players themselves. Thus the settlers of the backwoods towns will, in due season, enjoy Bernhardt in her portrayal of Sardou's masterpieces.

* * * * *

It is said that acetylene has now a rival, to which the name of Eureka gas has been given. This gas is the invention of Mr. Hector de Fazi, of Montefiascone, Italy. It is said to be obtained as follows: Lime as pure as possible is employed as a base, colophony and calcium carbide being added. One thousand parts of the mixture ready for use consist of 900 of quicklime, 50 of colophony, and 50 of calcium carbide. There is said to be no fear of explosion by mixing with air, no heating of water, and no special burner needed. One thousand parts of the mixture give 60 litres of gas at a pressure of 35 millimetres of water. The photometric intensity of the flame is stated to be 92·4 candle hours, and the same amount of calcium carbide employed singly would only give 18 candle hours. It is claimed that Eureka gas is fifty per cent. cheaper than acetylene, or that at equal cost it will give half as much more light.

* * * * *

Prof. Goldstein has made a communication to the Royal Observatory at Berlin, in which it is stated that he has succeeded in experimentally reproducing, by means of cathode rays, phenomena such as the radiation of light from the head of a comet and the resultant development of a tail. He has also been able, by these means, to account for certain peculiarities of this class of phenomena which have been observed in recent years.

* * * * *

M. Berthelot has contributed a note to the Paris Academy of Sciences on the temperature at which oxygen and hydrogen begin to combine. He finds that, in the presence of baryta, they completely combine in twenty-six hours at a temperature of 280° C.; but if the reaction is stopped after five hours, then barium peroxide is found to be present. He observed similar phenomena when caustic potash was used.

* * * * *

Dr. Knofler, of Charlottenburg, has been contesting with the German Welsbach Company the question whether his process of manufacturing incandescent mantles, by making a kind of artificial silk fibre from collodion containing salts of the required oxides, is an infringement of the Welsbach patent or not. The German Court of First Instance has found in favour of the Welsbach Company and interdicted Dr. Knofler, under a penalty of 75*l.* for each offence, from making or selling any of his mantles without the consent of the Welsbach Company, the judgment to take effect at once on the Welsbach Company lodging 1500*l.* in court.

* * * * *

At a recent meeting of the Berlin Industrial Society, Dr. Kraemer read a paper on benzol and its importance as an illuminant. The author pointed out that Bunte and Schilling were the first who recommended benzol as a carburetting agent for gas. By the use of four grammes of benzol per cubic metre of gas, its illuminating power could, he said, be greatly increased. The use of benzol as a carburetting agent permitted an easier desulphurisation of the gas, the recovery of a stronger and denser coke, and prevented the stopping up of the pipes by naphthaline. Although benzol was now being used more extensively for gas carburetting purposes, its consumption was still rather small. For a large city like Hamburg, for instance, it amounted to about 300 tons annually. Gasworks having good and cheap gas-coal at their disposal did not use benzol at all, and since the introduction of the incandescent gas light the illuminating power of gas proper had lost much of its former importance.

* * * * *

Dr. Kraemer mentioned that benzol could also be used directly as an illuminant, although by itself only in specially constructed lamps, owing to its high carbon contents. As early as 1855, mixtures of highly spirituous and carboniferous bodies, as spirits of turpentine, were used under the name of "camphine" for illuminating purposes. Recent tests with wood spirit and heavy benzol for incandescent lighting furnished favourable results. The proportion of 15 per cent. of wood spirit to 85 per cent. of alcohol should not be exceeded, as more wood spirit would cause the mantle to soot. It was shown that wood spirit could be replaced by 90 per cent. benzol without injury to the lighting power. Naphthaline was the least adapted, as it did not dissolve easily in alcohol. An addition of 15 per cent. of benzol to alcohol for an incandescent alcohol lamp proved a saving of more than 26 per cent., as compared with pure alcohol. For an ordinary lamp, of course, petroleum could not be replaced by this mixture on account of its higher cost, but in the case of a greater advance in the price of petroleum this alcohol (benzol mixture) should not be lost sight of.

* * * * *

Messrs. Fuerst Bros. write: "It will, no doubt, be of interest to your readers to know that from August 25 the price of Lumière's Cinematograph film views has been reduced to 2*l.* 10*s.* each, less usual discounts to dealers."

* * * * *

The London Stereoscopic Company, of 54, Cheapside, announce that they have a selection of films taken from unique positions at the Jubilee celebration, including Her Majesty, the Queen's carriage, Royal Princes, and the Colonial troops.

LANTERN MEMS.

"To be or not to be" a good lantern season, is the question just now exercising the minds of those interested in lantern production and sale; for after a dull season such as the last was, with the exception of the Cinematographe boom, there is a general looking forward to "better times," and the prospects are certainly more favourable.

* * * * *

The record reign has been productive of some unique ceremonies and pageants, and those who have been fortunate in witnessing them, and, above all, successful in getting snapshot or other photographs, will desire to show the results to those not so well placed, or who, through force of circumstances, were not able to be eye-witnesses. The Jubilee thanksgiving procession pictures will be in demand as will also the naval review slides, and those published professionally, either by themselves or in addition to the amateur's own, should form a set that will give pleasure to the "country cousins" and those who stayed at home.

* * * * *

Amateurs and others have every inducement to make lantern slides from their own negatives, as they can do so readily, and, when made, project them on a screen to show their friends, without incurring a great expense. Some of the four-inch lanterns are marvels of cheapness, and cost does not now stand in the way of having one's own apparatus, as it used to in "the days of yore."

* * * * *

The things that most exercise one's mind when looking at lantern matters *pro* and *con.*, is the fact that two of the lights available as illuminants for the optical lantern are not yet on a satisfactory basis as far as the authorities and the public are concerned—I allude to acetylene and the oxyether light. The former is a convenient and bright light for small size discs, and the latter for use where hydrogen or house gas is not available to be used with oxygen for the limelight.

* * * * *

It would certainly be satisfactory to the public, and a lucky thing for the designers and manufacturers of acetylene apparatus, if the County Council or Board of Trade, or other responsible authority, whoever it might be, would "pass" as satisfactory a generator for acetylene gas that could be used in public halls or private rooms without suspicion of danger.

* * * * *

With the oxyether light and the "cloud" produced by the lamentable affair in Paris, followed by the prosecution of the organizer and operator, there is more than ever necessity for extra care in use of safety apparatus. That it is a beautiful light, and, withal, a very powerful one, no one who has seen it and worked with it will deny; and now ether saturator manufacturers should see that their instructions and "cautions" are *complete;* and operators using the light should not only have had previous experience, but also apply common sense at the time of use.

* * * * *

To those who have not yet adapted the limelight to their lantern, and are in doubt as to what light to settle on, I say decidedly, if they have not electric current available, hesitate no longer, but use compressed gas in cylinders for both oxygen and hydrogen (or house gas). Even if gas is laid on, the convenience of having both gases at hand and no anxiety about suitable connexions is more than a counterbalance to the extra initial cost; and as regards the working cost, it cannot seriously be considered when the extra light available is taken into account, for at the outside it could not represent more than half-a-crown for an entertainment, and this secures safety as far as human ingenuity and care can ensure it.

* * * * *

For those who have the electric current laid on, there is no end of choice now in the way of arc lamps or regulators, and already this season new patterns of hand-fed lamps have been designed by Paul, Hepworth, and Davenport. Some have the merit, or claim it, of extreme simplicity; while others, profiting by the experience gained during the past two seasons, have concentrated such adjustments that are necessary for delicate optical centering, with reduced size and simplification of working parts. No doubt these new patterns will be duly noticed in the Lantern Record and illustrated, so that lanternists may be able "to take their choice." G. R. Baker.

SOME NOTES ON LANTERN SLIDES—TO BEGINNERS.

Density.

One of the very first things that the would-be successful maker of lantern slides should thoroughly understand, is that density is a thing to be avoided. A lantern slide is a very different thing from a window transparency—at least, it should be. The latter, to be really effective, must generally have deep, heavy shadows, into which you have to look long and earnestly to discover all the detail. If the high lights be veiled it does not matter much, for a little extra light behind will put that right. Generally speaking, a transparency for viewing by transmitted light should be as plucky as a good negative. But it is not so with a lantern slide. If you take an ordinary silver print of full density and plenty of contrast, and hold it up so as to view it by transmitted light, it will seem very feeble and thin; that is because the light which is reflected from a paper print passes twice through the picture-film before it reaches your eyes. The incident light passes first through the film, and it is then reflected by the paper behind, whence it goes through the film again before finally reaching the eye. Practically, therefore, the light by which you view an ordinary paper print passes through two photographic transparencies before it reaches your eyes. Naturally, those transparencies must be of only half the density of one which is viewed singly, as in a print upon glass for window decoration. Now, a lantern slide is merely a device for casting a shadow upon a white sheet. We do not look directly at the photograph, but at its shadow on the screen. In a sense, therefore, it is analogous to the paper print, in that the light passes through the film, and is then reflected to the eye by a white surface behind. But, on the other hand, the light does not have to pass twice through the film, and it may, therefore, be supposed that a good lantern slide should strike the happy mean between the density of a silver print and that of a window transparency. An examination of a few of those slides which give the most pleasing effects in the lantern will reveal that this is so.

Transparency.

A technically perfect lantern slide should have some portion at least which is represented by perfectly clear glass. There are exceptions to the rule of course, where certain peculiar effects are sought after; but then there are exceptions to every rule. It may be taken as a general axiom that when a perfect lantern slide is laid down on a piece of white paper, some portions will appear perfectly white, or rather with only so much discolouration as is accounted for by the thickness of the two glasses. Also, that even the deepest shadows will be sufficiently transparent for it to be possible to discern the lettering on a piece of newspaper held behind. In other words, the lantern slide, as seen in the developing dish before fixation, should present some portion or portions that are perfectly white, without the slightest traces of discolouration or fog, either of purely chemical origin or due to the action of light.

Chemical Reduction.

The yellow colour which results from an access of air to the plate, during or after development with hydroquinone, can be removed by soaking the fixed and washed slide in a weak solution of red prussiate of potash (ferricyanide of potassium). The solution should be what might be roughly described as straw-coloured, and the slide only allowed to remain in for just sufficient time to effect the desired result. If left in the solution for too long a period, the image becomes bleached in a somewhat similar manner to that which is the result of mercurial intensification. The density, however, is not increased but rather reduced; and there is also this difference, that it does not appear to be possible to blacken the image again by any of the usual methods. If some of this solution of red prussiate of potash be mixed with some of the ordinary fixing hypo, it forms a very useful reducer, by which undue density of the lantern slide may be obviated. By this means it is possible to turn a very much over-exposed and over-developed slide into a satisfactory lantern picture.

Local Reduction.

This reducer is also extremely useful in the local "faking" of lantern slides, either for the elimination of faults and undesirable attributes, or

production of certain effects which cannot be produced by the ordi-y processes of pure photography. Supposing that one has produced m a negative exceedingly poor in contrast the best lantern slide that is possible to obtain from it, and that the sky of the picture, we will r, has become veiled, owing to the light having, in spite of all pre-ıtions, penetrated the thin negative at this part, it is desired to clear s sky, so that it is perfectly white without in any way interfering with ıer portions of the picture which are no denser than they should be. ıe slide should be lifted from the washing water, and held slantwise in ə hand, with the sky portion lowermost. Then with a soft camel's-ir brush the reducing solution may be carefully and plentifully applied the portion to be eliminated, and continually mopped over its surface ıtil the desired reduction is accomplished. Needless to say, the slide ıst be thoroughly washed after this operation. Again, where high hts want accentuating, not only on account of poorness and lack of ntrast in the original negative, but for the sake of heightening the tistic effect of the whole, a little of the solution may be applied locally, ten with very fine results. Great care must be exercised in this use of e reducer, or the last state of the slide will be very considerably worse an the first. More especially must the precautions be directed against ıe flowing of the solution over parts where its presence is not required. 'here the portion to be operated upon is at the edge of the slide, as in ıe case of a sky, &c., it suffices to tilt the glass in such a manner that ıe surplus solution will run off in a direction where it will do no harm. or the picking out of tiny high lights, such, for instance, as a little speck presenting a white dress in a landscape, or other similar object with ell-defined edges, another mode of employment may be recommended. lop off the surface moisture from the gelatine with blotting paper care-ılly applied, or by gently squeegeeing with the ball of the hand. Then strong solution of the reducer may be applied with a fine brush, and ıopped off again with blotting paper if a fresh application be deemed ecessary, until the desired effect is produced.

Method of Printing-in Clouds.

Printing-in clouds to a lantern slide is not an easy matter, owing to the act that the tremendous magnification to which the result will be sub-ected will almost certainly reveal the art which, we are told, it is the ighest ambition of art to satisfactorily conceal. Yet it is often very mportant indeed to have them, for a bare white sky, if of any expanse, s just as ugly and undesirable in a lantern picture as in any other. But here is one plan for the introduction of clouds into a picture which is pplicable to lantern slides while closed to other processes of printing. t is probably the best that can be adopted, for it is extremely simple, and rrors of exposure in the printing of the cloud portion—so easily made—lo not endanger the remainder of the picture. Instead of employing a plain piece of glass for the protective cover glass of the slide, that cover glass is used as a support for the cloud photograph, while the rest of the picture is produced in the usual way. Thus, of course, two lantern plates are required for the production of each complete slide, one being a print from the principal negative and without clouds, having a perfectly clear sky, whilst the other consists of a photograph of the suitable clouds alone, the lower part of the view consisting merely of clear glass. In the end, these two glasses are bound together face to face in the ordinary manner. It stands to reason that two transparent photographs intended to be viewed when they are placed face to face, will present exactly the same appearance by transmitted light when they are placed back to back. A lantern slide is made in the ordinary manner from a landscape to which it is intended to attach clouds. Similarly, another is made from the cloud negative which has been selected as suitable to this particular landscape. These two photographs are developed and fixed, and washed side by side. Then they are placed back to back and viewed by light passing through them both. It will probably be found—no precautions having been taken against the production of such a result—that many of the clouds will be below the horizon line, and are therefore visible through the landscape, while, on the other hand, the sky portion of the landscape picture is veiled or fogged and interferes with the due clearness of the clouds. Let us deal with the former first. It has been said that the two glasses have been placed back to back and being wet they will naturally stick pretty closely. Place the compound slide so that the cloud photograph is facing you, and hold it upright so that the clouds are uppermost and the landscape—which is seen through both glasses—is below. Now with a brush full of strong reducing solution, follow the horizon line all along, keeping just below it, and in this manner cause to disappear all portions of the cloud picture that, coming below the horizon of the landscape, are not wanted and, indeed, are very much in the way. When that result is accomplished, give the slide a good rinsing to remove superfluous reducer that might otherwise run over the clouds and ruin them, and proceed to operation number two. This is merely the converse of the other. Hold the compound slide so that the landscape picture faces you this time, and invert the whole so that the clouds are downwards. Now with a mop full of reducer go over the sky portion of the landscape photograph, keeping just to the other side of the horizon line as before, and thus clear away all traces of deposit here where they are not wanted. The glasses are then separated, and the washing side by side continued in the ordinary manner. After drying, when the two glasses are bound up together with a suitable mask between, it will be found that they fit one another exactly, and no line of demarcation other than that which appears natural will be discernible.

Quality of the Negative.

Lantern slides, like enlargements upon bromide paper, are more generally successful when the negatives from which they are made are moderately thin and full of detail, while the contrasts are not too great. In these days, when gelatino-chloride papers are so largely used, it is more usual to find negatives which are suitable to lantern-slide work than when the less plucky albumenised paper was in common use; but while negatives which are produced with a special view to lantern-slide making may well be kept for piling on unnecessary density when once all the detail is fully evident, it by no means follows that satisfactory slides can only be made from negatives which belong to this class. On the contrary, there is no printing process which is so adaptable to various qualities of negative as that of lantern-slide making. Again, like enlargements on bromide paper, by the proper procedure as good a print may be made from a bad negative on a lantern plate as by any other method of printing, but the result may not be suitable for projection. Flaws and scratches, fuzziness and lack of detail, will be tremendously exaggerated when the slide is projected on the screen, and unless a negative is fairly free from such blemishes it should by no means be selected for lantern-slide work.

Cecil M. Hepworth.

THE MICROMOTOSCOPE.

The principles of the kinetoscope or mutoscope have been applied to the microscope, with some interesting results, by Dr. Robert L. Watkins, says Mr. D. F. St. Clair in the *Scientific American*. The instrument, though simple, was made a success only after many experiments and failures in adjusting the objective of the microscope in a line with the right sort of light and a rapidly moving film.

The principal difficulties in making a mutoscope out of so delicate an instrument as the microscope are the light and the lens. Every electric lamp in the market, when its light has been concentrated sufficiently for photography, will, after a short time, with its heat, kill, dry up, or impair almost any kind of life in the microscopic field. The greater the magnification, the more intense the light must be, and the nearer the microscope. This difficulty was often enhanced by the length of time it took to get a focus on the sensitive film, but most of the pictures taken were good, and show well the various characteristics of the action taking place in cell life, so far as it can be observed with the microscope.

Whatever is to be photographed, once it is put in the field of the lens, is adjusted to a horizontal plane. Near one end of the microscope is placed an electric lantern containing a small arc light concentrated on the object. Near the other end is the box that covers the apparatus for moving the long, sensitive gelatine film. The film runs like a belt on wheels, and passes in front of a tiny window in the box, and on a direct line with the lens and light. This machinery is turned by a crank, and its ordinary capacity is about 1600 pictures per minute. It is possible to increase it to 2000 or 2500, but for most purposes 1000, or even less, per minute will record every motion taking place in most cell life. Dr. Watkins found, however, after a number of trials, that he could not turn the machine fast enough to photograph the motion of the blood circulating in the web of a frog's foot. He simply needed a larger wheel.

The advantages of mutoscopic photography to microscopy are quite evident, especially as regards the action of bacteria and blood cells. Nearly all the numerous families of bacteria have motion, often motion that the eye cannot always follow clearly. It has already been discovered that the same kind of bacteria will act very differently under different circumstances. For instance, a flash of bright light will suddenly drive some kinds to cover. Some kinds will readily seek the negative pole of the battery. They will also seek food with avidity, and reject poison with true instinct. All such phenomena can, of course, be followed with the eye, but not with the same detail in the microscopic field as in a series of clear photographs. The fact is that, on account of the motion of some bacteria, it has been well nigh impossible to photograph them. The books have had to depend upon the eye and hand of the draughtsman and vague description. This may not be of much importance either way, but as yet comparatively little is known about bacteria. It is not yet known whether they are the cause of

disease or its results, or neither. Photography, under the proper circumstances, is most needed for the investigator, and it can be only moving photography.

The capillary or circulatory motion of the blood cells, after the blood has been drawn, are comparatively slow at best. But the amœboid movement of the white cells and the changes taking place in the nuclei are complicated, and often hard to intelligently watch in the field. Many of these changes occurring in the white cell are certain to escape attention, but all of them will be clearly recorded on the rapidly moving sensitive film. These motions in the white cells, though they are as yet imperfectly understood, are full of meaning to the physiologist and pathologist. The offices that the blood performs in the body are believed to be due mainly to the action of the white cells. Certainly, the character of their amœboid action is one of the surest indications of health or disease.

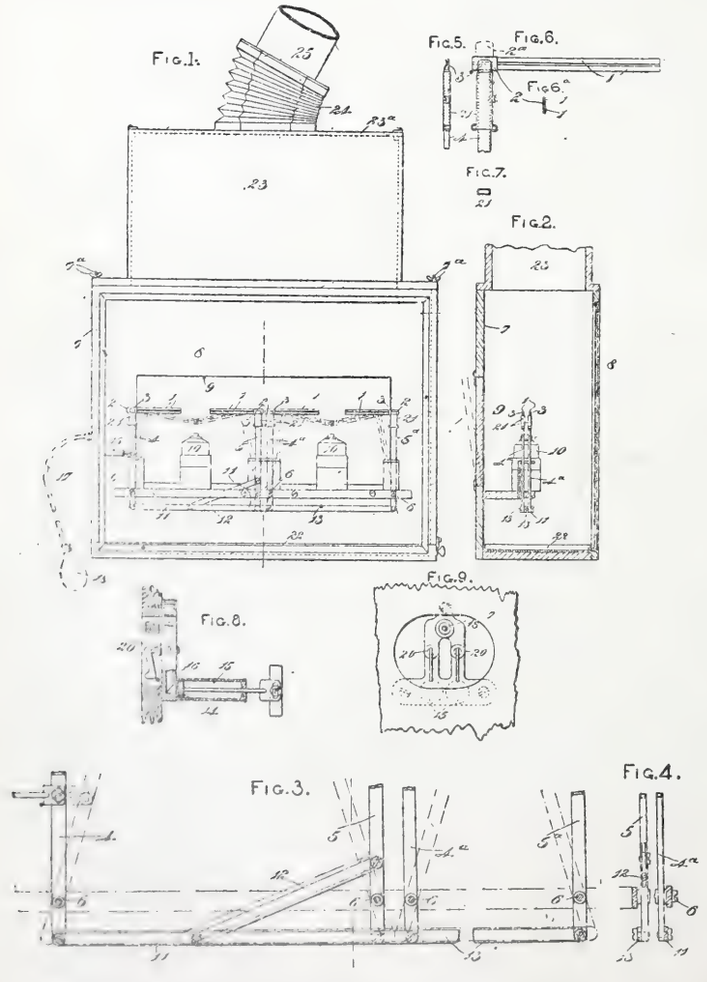
But with the micromotoscope it need no longer be impossible to photograph the blood in actual circulation. With a better light the cells may be seen in the thin tissue of the ear or the web of the fingers. They have often been examined in the peritoneum during an operation, and Dr. Watkins himself has made a close study of them in the web feet of some birds and the tails of fishes.

SALMON'S MAGNESIUM LIGHTING APPARATUS.

This is a portable lighting apparatus that can be readily carried from place to place and set up where desired, and in which magnesium ribbon can be burnt for the purpose of producing a powerful artificial light for photographic or other purposes, when sunlight is not available or desirable.

Figs. 1 and 2 show the apparatus in front elevation and cross section respectively, and figs. 3 to 9 inclusive are enlarged and detail views.

In the apparatus, the strips, 1, of magnesium ribbon which may be fixed in pairs in metal holders, 2 (figs. 6, 6A), are mounted in spring clips, 3 (fig.



5), at the upper ends of arms, 4, 5, that are pivoted at 6 within a closed casing, 7, which has a glass front, 8, and a hinged door, 9, at the back, within which are also arranged one or more spirit lamps, 10. Or Bunsen burners may be used where more convenient. There may be one or more sets of pivoted arms, and each set may comprise one or more of such arms, the strips of magnesium ribbon carried by each pair projecting towards each other and towards the lamp, 10, situated between them. In the example shown there are two sets of arms, each comprising two pairs of levers, viz., 4, 5, and 4^a, 5^a (figs. 1, 3, and 4). Arm 4 is connected by a link, 11, to the arm 4^a, and arm 5 is connected by a link, 12, to the link 11, and by a link, 13, to the arm 5^a. The arm, 4, of each set is connected to the piston, 14, of a pneumatic cylinder, 15, which is in communication by a passage, 16 (fig. 8), with a rubber tube, 17, and ball, 18, outside the apparatus. On pressing the ball, 18, air will be forced into the cylinder, 15, and the piston, 14, therein will make its outstroke with the result that the pairs of pivoted arms will be moved from the upright position shown in full lines in figs. 1 and 3, into the inclined positions shown in dotted lines, and the strips, 1, of magnesium ribbon will be brought into contact with the flame of the lamps, by which they will be simultaneously ignited and thus produce a powerful light of several seconds duration.

When two or more sets of pivoted arms are used, each of the pneumatic cylinders, 15, is preferably connected up to the same rubber ball, 18, and tube, 17, by a passage, 16, provided with a cock, 20, so that the piston, 14, controlling any set of pivoted arms can be worked at will, and before the expiration of the light produced by the burning of one set of magnesium strips, another set can be brought into action by again pressing the ball, thus giving a continuous light. Or by opening all the cocks, 20, and pressing the ball, the several sets of magnesium strips can be ignited simultaneously when it is desired to produce a very powerful light. The clamps, 2, holding the ends of the burnt strips are detached from the clips, 3, by moving upward, tubes, 21 (figs. 5, 6, and 7), arranged to slide upon the pivoted arms, the detached clamps falling into a tray, 22, at bottom of the casing, 7. The arms are then recharged, the door closed, and the apparatus is again ready for another series of illuminations at the will of the operator. The clamps, 2, may be provided with finger pieces, 2^a (fig. 6), to facilitate their removal. In this case the sliding tubes, 21, may be dispensed with.

The door, 9, also enables the operator to remove the lamps from their sockets for trimming and lighting, and to make all necessary adjustments from the back of apparatus.

The smoke and smell produced by combustion ascend into a smoke chamber, 23, and are conducted thence by a portable telescopic discharge pipe or chimney, which can be inclined at any angle and in any direction out of window or nearest available place by means of a bellows, 24 (similar to that of a concertina attached to the top of the smoke chamber) and provided with a tubular extension, 25, over which the said telescopic chimney is slipped.

To render the apparatus portable and compact for transport, the smoke chamber, 23, is made detachable from the casing, 7, and the cover, 23A, is made detachable from the smoke chamber. The latter when detached is turned upside down and secured within the casing, and the cover is turned upside down and secured upon the smoke chamber, so that the bellows and tubular extension are then located within the same, a cover (not shown) is then secured over the whole by the screws and nuts shown at 7A.

The glass front of the casing may during transport be protected by a sliding lid. The telescopic chimney after being detached from smoke chamber is shut up and packed with a tripod or other stand, on which the casing, 7, is screwed when in use.

HEINZE'S APPARATUS FOR TAKING ANIMATED PHOTOGRAPHS.

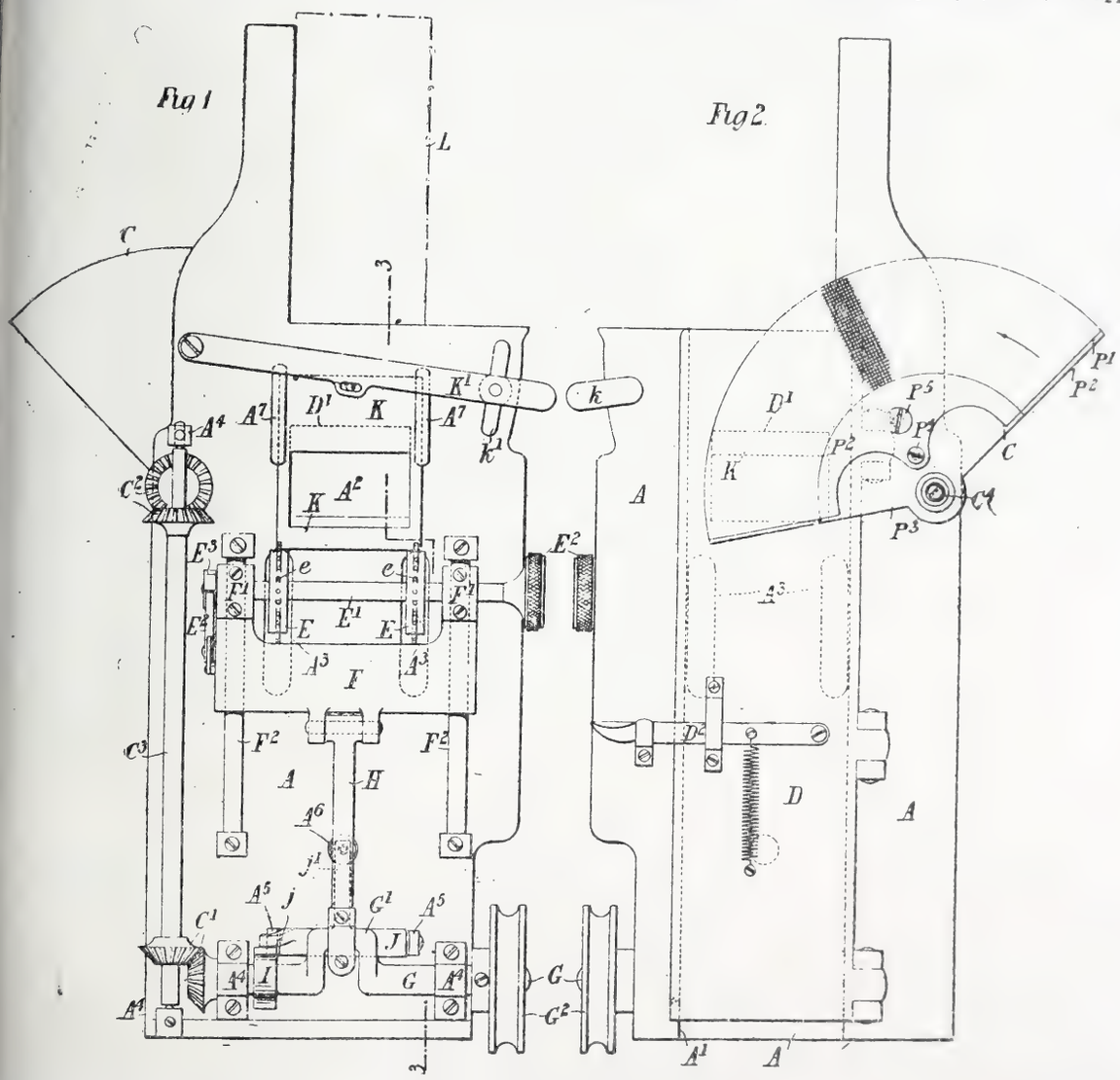
This consists of a suitable plate or framework, in or upon which is a channel through which the film is passed and moved along with an intermittent motion by the mechanism to be presently described. At one part of this channel is an opening through which the light can have access to the film, the opening being, in the case of reproductions, alternately covered and uncovered by a perforated screen, and, in the case of photographing the image upon the film, by an opaque shutter.

At a suitable part of the channel are provided preferably two rollers which may be carried upon a spindle having a milled head or other means by which it may be turned or set by hand when necessary; this spindle is carried in bearings upon a frame, which is reciprocated in the direction of the length of the channel by any convenient mechanism, say, for example, a connecting rod, operated by a crank upon a shaft driven by the motor or power which operates the whole apparatus. The crank shaft, by suitable gearing—bevel wheels and an intermediate shaft, for example—imparts the movement to the rotating screen, and a cam or equivalent device upon, or in connexion with, the crank shaft operates a detent, which serves to hold the film during the forward stroke of the reciprocating frame and axle, but is withdrawn and allows the film to travel during the backward movement of the frame and its parts.

To enable the rollers or equivalent to take hold of the film during the back stroke, they may be provided with points which engage with corresponding perforations in the edges of the film. During the forward stroke the rollers rotate, merely travelling over the film, but during the backward stroke the rollers are prevented from turning, and their points

engaging with the film, pull it along, as will be well understood. This alternate movement and stoppage of the rollers may be effected in various ways, a suitable mechanism, consisting of a spring pawl or detent, engaging with a ratchet or other wheel upon the axle which carries the rollers, or two of these may be employed, one upon each roller. Instead of having actual perforations in the edges of the strip, the patentee provides the rollers with points, which would engage with the film and draw it along without actually entering perforations in it; or, again, the teeth may be dispensed with and the rollers roughened or provided with rubber or other covering, or other means may be used to cause the rollers to efficiently grip the film and draw it along. Instead of two rollers, as above described, one roller may be used, pressing upon the whole of the face of the film, or it may be recessed so as only to engage certain parts of the film.

To conveniently adjust the exposure opening to the position of the pictures upon the film, adds the patentee, I may employ a frame or



equivalent, the precise position of which could be adjusted conveniently by a nut and screw, lever and spring, or by other suitable means.

The film, preferably in the form of a roll, may be carried in a drum or cylinder, one of the ends of which may operate as a lid and be opened to admit the insertion or withdrawal of the film; an opening is made in the periphery of the drum, closed by a spring lid, faced, if desired, with velvet or equivalent material for the film to pass under on its way out of the drum. I may have an axial pin in the drum, with a tube or roller upon it, to facilitate the turning of the roll of film should the latter become tight thereon.

With the exception of the perforated or opaque shield, the apparatus is the same, whether for originally photographing on the film or for reproducing the pictures.

In some cases I employ one or more screens, bearing one or more colours, for the purpose of imparting the desired shade or tone to the whole or a portion of the picture; this may be operated by hand only, or, where it is necessary to rapidly change the tone, it may be in connexion with the mechanism, so as to automatically vary the shade.

As a means of regulating the speed at which the mechanism rotates, I prefer, when the instrument is driven by mean of the electric current, to employ a switch and a series of resistances, so that, by throwing these in and out of the circuit, I can increase or diminish the speed.

The invention will be best understood by reference to the accompanying drawings, in which

Figs. 1 and 2 are elevations of two respectively opposite sides of one form of my improved apparatus; of these two figures, fig. 1 is herein regarded as a back, and fig. 2 as a front, elevation.

Fig. 3 is a section on the crooked line 3—3 of fig. 1, with portions of the apparatus omitted.

Fig. 4 is a perspective view of the film-container or drum, and

Figs. 5 and 6 are elevations, as seen from positions at right angles to each other, of a modified form of the film-gripping mechanism shown in figs. 1 and 3.

Like letters of reference indicate like parts throughout the drawings.

As shown in figs. 1, 2, and 3, the apparatus consists of a suitable plate or framework, A, in or upon the front side or face of which is provided a channel, A^1, through which the film, B (fig. 3), is passed, and along which it is intermittently moved, as hereinafter described. At one part of the channel, A^1, is an opening, A^2, through which the light can have access to the film, B, the opening, A^2, being alternately covered and uncovered by a revolving screen or shutter, C.

To the front of the plate, A, is hinged a door, D, adapted to close in the front of the channel, A^1, and retain the film in proper position therein, this door being provided with an opening, D^1, coinciding with the before-mentioned exposure opening, A^2. The door, D, is provided with a preferably spring-controlled latch, D^2, for retaining it in its closed position, which latch, when raised, admits of the door being opened, so that free access may be had to the film within the channel, A^1.

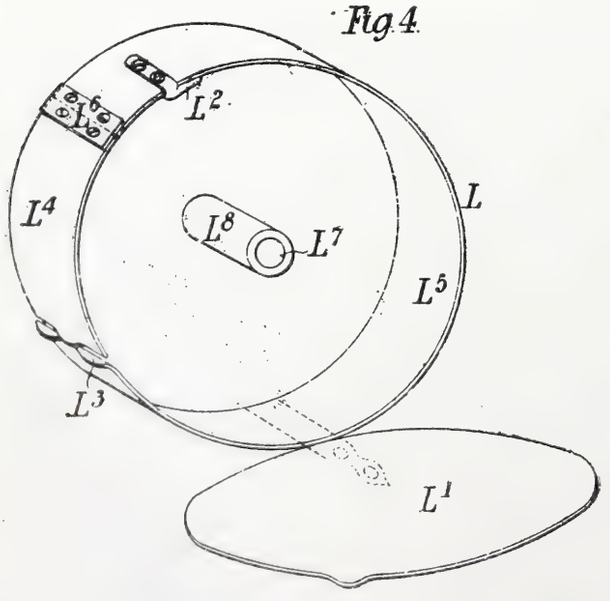
At a suitable part of the plate, A, and within the channel, A^1, I provide preferably two openings or slots, A^3, through which project, from the back of the plate, A, the rollers, E, secured upon a spindle, E^1, having a milled head, E^2, or other device by which it may be turned by hand when it is desired to adjust the film, B. The spindle, E^1, is carried in bearings, F^1, formed or provided in or upon a frame, F, which is reciprocated on guide rods, F^2, in the direction of the length of the channel, A^1, by any

convenient mechanism, say, for example, as shown in the drawings, by a crank, G[1], upon a shaft, G, and a rod or link, H, pivotally connected to the frame, F, and crank, G[1]. The crank shaft, G, may be rotated by any convenient means, the motion being transmitted to it through a pulley, G[2], or in any other desired manner. Through two pairs of bevel wheels, C[1], C[2], and an intermediate shaft, C[3], the crank shaft, G, transmits rotary motion to a shaft, C[4], on which is secured the before-mentioned screen or shutter, C, suitable bearings, A[4], being provided for supporting the crank shaft, G, and intermediate shaft, C[3]. I is a cam secured on the crank shaft, G, and adapted to periodically raise or operate on the free end of the nearly horizontal arm, *j*, or a two-armed or bell-crank lever, J, pivoted between lugs, A[5], at the back of the plate, A. To the second, or substantially vertical, arm, j^1, of the lever, J, is pivoted a detent, J[1], the operative end of which, faced with indiarubber or other suitable material, J[2], projects through a hole, A[6], in the plate, A, so as to enable it to act upon the film, B, and, by pressing the latter against the door, D, temporarily arrest the longitudinal motion of the film. A spring, J[3], is interposed between the lever arm, j^1, and detent, J[1], so as to allow the latter to accommodate itself to suit the varying thicknesses of film passing between it and the door, D; J[4] is a pin, screw, or equivalent stop, which may be adjustable in the lever arm, J[1], for limiting the backward movement of the detent, J[1], independently of the arm, j^1, and which may also serve for supporting the spring, J[3].

To enable the rollers or equivalent to take hold of the film during the backward or downward stroke of the frame, F, they may be provided, as shown in figs. 1 and 3, with points, *e*, which engage with corresponding perforations in the edges of the film, B; these perforations are not shown in the drawing. During the forward or upward stroke of the frame, F, the rollers, E, rotate and merely roll over or upon the film, B, which at that time is retained in position by the retarder, J[2], but, during the backward or downward stroke, the rollers, E, are prevented from turning, and their points, engaging with the film, pull it along, as will be well understood. This alternate movement and stoppage of the rollers may be effected in various ways, a suitable mechanism being that represented in figs. 1 and 3, which consists of a spring-controlled pawl, E[2], pivoted to the sliding frame, F, and a ratchet wheel, E[3], secured upon the spindle, E[1]. Instead of having actual perforations in the edges of the film, B, I may provide the rollers, E, with points, which would engage with the film and draw it along without actually entering perforations in it; or, again, the teeth may be dispensed with, and the rollers, E, roughened or provided with rubber or other covering, or other means may be used to cause the rollers to efficiently grip the film, B, and draw it along. Instead of two rollers, as above described, one roller may be used, pressing upon the whole face of the film, B, or it may be recessed, as hereinafter described with reference to figs. 5 and 6, so as only to engage certain parts of the film.

To conveniently adjust the exposure opening to the position of the pictures upon the film, I make the openings, A[2] D[1], larger than they actually require to be for the mere exposure of the pictures, and, at the back of

Fig 4.



the plate, A, I provide a frame, or equivalent, K, which is capable of being adjusted in guides, A[7], by a lever, K[1], so that it may be raised or lowered in relation to the openings, A[2] D[1], the effective size of which will thereby be increased or decreased. The lever, K[1], may be bent so that a portion, *k*, thereof extends round the front of the plate, A, as shown in fig. 2, and a blade spring, K[1], may be secured to the lever, K[1], so that it will press upon or against the plate, A, with force sufficient to prevent any accidental displacement of the frame after the latter has been adjusted.

The film preferably, as shown diagramatically in fig. 3, in the form of a roll, may be carried in the drum or cylinder, L (fig. 4), the end, L[1], of which may operate as a lid, and be opened, as shown, to admit of the insertion or withdrawal of the film; the lid, L[1], may be retained in its closed position by a spring catch, L[2]. An opening, L[3], for the passage of the film to the channel, A[1], is made in the periphery of the drum, L, of which a portion, L[4], adjacent to the opening, L[3], is connected to the main portion of the cylindrical wall, L[5], by a spring or spring hinge, L[6], so that the portion L[4], by pressing upon the film, acts as a brake thereon, and prevents it from being unwound too quickly. The surfaces of the portion or brake, L[4], and other portions of the drum, L, against which the film is brought into contact, may be lined with velvet or other suitable material to prevent any abrasion of the said film. Within the drum, L, I may provide an axial pin, L[7], with a tube or roller, L[8], thereon, to facilitate the rotation of the roll of film should the latter become tightened thereon.

Instead of employing the before-described devices for moving forward the film, I may employ the mechanism shown in figs. 5 and 6, which comprises a single recessed roller, E, such as that previously referred to, mounted by its spindle, E[1], in the sliding frame, F, and a swinging frame or yoke, M, adapted to be alternately pressed into engagement with and moved away from the film, B. For this latter purpose the swinging yoke, M, which is pivoted on a pin, M[1], is provided with an arm, M[2], carrying on its end an anti-friction roller, M[3], which is adapted to engage with a cam or guide, N. The guide, N, which is rigidly mounted on a fixed bracket, O, has three operative faces, *n*, n^1, n^2, of which the first is vertical or parallel with the guide rods, F[2], on which the frame, F, slides, and the two last-named are inclined in relation to the guide rods, F[2]. At the back of the upper part of the guide, N, I provide a spring, N[1], which pushes forward the anti-friction roller, M[3], when it reaches the upper end of its travel. The inside of the swinging yoke, M, where it acts on the film, is preferably lined with indiarubber to enable it to properly grip without abrading the film.

The operation of the last-described device is as follows:—

When the frame, F, commences its downward stroke, the anti-friction roller, M[3], travels down the short downwardly inclined face, n^2, at the top of the guide, N, and the yoke, M, is thereby pressed firmly against the film, B, which is thereby gripped between the said yoke and the roller, E. During the remaining portion of the downward stroke of the frame, F, the yoke

Fig 5

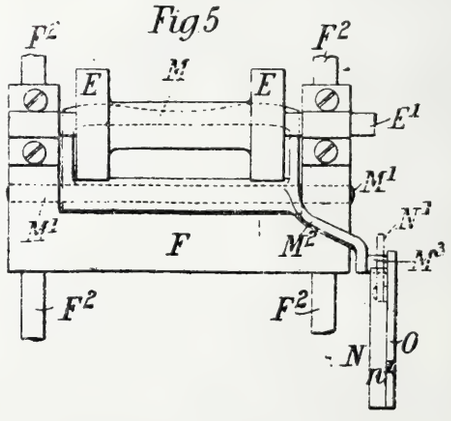
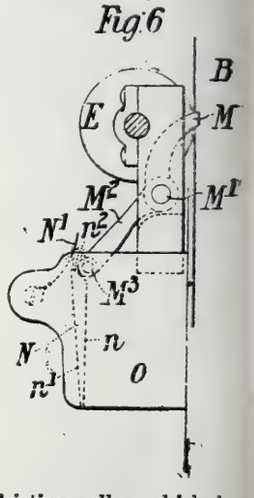


Fig 6



is retained in its gripping position by the anti-friction roller, which is prevented from swinging backwards from the film by the guide face, *n*, and the film is thereby moved along with the frame, F. As soon, however, as the anti-friction roller, M[3], descends below the guide, N, the pressure is withdrawn from the yoke, M, which is thereby free to move independently of the film, which consequently remains stationary. When the frame, F, ascends, the anti-friction roller, M[3], travels over the incline face, n^1, and the yoke is thereby moved forward out of contact with the film, which at this part of the operation remains stationary. When the anti-friction roller passes over the upper end of the guide, N, the spring, N[1], pushes it forward ready for the next descent of the frame, F.

When the apparatus is to be used for photographing the image upon the film, the screen or shutter is opaque throughout its length, and, when it is to be used for reproducing the pictures, the screen or shutter may be perforated throughout a portion of its length, these perforations being graduated so that the pictures may be gradually brought into and withdrawn from view. With the exception of this difference, the apparatus may be the same whether it be intended for originally photographing on the film or for reproducing the pictures.

The shutter, C, see fig. 2, is mainly composed of two thicknesses, P[1] P[2], of wire gauze, one thickness, P[2], being fixed to the plate, P[3], which in turn is fixed to the shaft, C[4], and the other thickness, P[1], being fixed to the plate, P[2], which is adjustable upon the plate, P[3], being pivoted

ereto at P^4. P^5 is the head of a screw, which passes through the ates, P^2 P^3, so as to lock the two thicknesses of wire gauze, P^1 P^2, in any sition to which they may be adjusted in relation to each other. By ving one thickness upon the other, it is possible to vary the amount light obstructed by the shutter from a minimum, which would be tained when the wires of the two thicknesses are exactly superposed, a maximum, which would be obtained when the wires of the one ickness of fabric lie opposite the interstices of the other thickness. It found advantageous to be able to vary the amount of light obstructed this manner, for, with a series of faint pictures upon the film, it is fficient to obscure the latter during the change of pictures without solutely blotting it out, such obscuration producing a less unpleasant ect upon the observer than the occurrence of a complete eclipse after ch exposure; and, by varying the amount of light obscured, the degree obscuration can be proportioned to the density of the pictures being own. It is convenient to have a perforated shutter, with certain nsities of picture on the film, even though the shutter may not possess eans for varying the degree of obscuration. If desired, the shutter may differentially perforated, that is to say, the perforations may be so aced that light can pass more readily through the leading edge than rough the following edge.

NOTES ON LUCIUM.

[Journal of the Franklin Institute.]

r May of last year, I secured several samples of the so-called "lucium" hich had been prepared by Dr. Leon Schützenberger, of Paris, and at e same time saw a report in which this chemist gave very fully the ethods which he used in preparing it, and his conclusions regarding e same, also samples of the monazite sand used.

The methods he employed follow very closely those set forth in the tent of Mr. P. Barrière.

The monazite sand was a low-grade North Carolina sand, containing inerals rich in titanium, zirconium, and yttrite earths, such as menacnite, rutile, zircon crystals, samarskite, euxenite, and xenotime, and it probable that from the last three minerals the "lucium" is obtained.

On experimenting with a solution of the lucium nitrate, the ignited h or residue I found to be of a dirty grey colour, and nearly entirely luble in hydrochloric and nitric acids, even when diluted. This lution was clear and pink, and gave the absorption bands of erbium. s the time recommended by Mr. Barrière for digesting with the potasum sulphate for the separation of the cerite group seemed to be rather ort, I saturated the solution with potassium sulphate in the cold, and lowed it to stand forty-eight hours, thereby obtaining a precipitate nsisting of the cerite group, and in the solution the yttrite group. nalysis showed:—

Yttrite group oxides	93·98
Lanthanum, cerium, didymium oxides	3·74
Thorium oxide	1·07
Titanium, zirconium, potassium, sodium oxides, and sulphuric acid, not separated	1·21
	100·00

The oxides of the yttrite group after this thorough purification by otassium sulphate were of a light buff or yellow colour, fully and comletely soluble in dilute acids. Sodium hyposulphite did not give a recipitation in a fairly concentrated solution, nor was there any diffiulty in making a partial separation of the erbium nitrate in the fused itrates by Bahr and Bunsen's method. Although the quantity at my isposal was small, I obtained the erbium nitrate crystals and showed he possibility of this separation.

Regarding the precipitation with sodium hyposulphite, on which great tress is laid as a reaction, showing "lucium" to be a new element, if a olution of yttrite sulphates in a concentrated solution of potassium ulphate made by cold digestion is heated, a copious precipitation will nsue. Though not a perfect separation, yet advantage can be taken of his reaction in separating yttrium from erbium, and this reaction should e borne in mind when separating the cerite from the yttrite group, as ome text-books recommend using hot saturated solutions. By doing o, some of the yttrium will be precipitated with the cerite group.

This action of heat on the double sulphate solution of the yttrite roup, if it does form similar salts to the cerite group, I have not met vith in the text-books. Therefore, inasmuch as Schützenberger and Barrière added the sodium hyposulphite to the concentrated solution, nd then heated the resulted mixture, I believe the precipitation was due o the above action of heat rather than to a precipitation by the sodium yposulphite. In a ten per cent. solution of the yttrite group, oxides, I btained but a slight precipitation with sodium hyposulphite, which, on e-solution and treatment, did not again precipitate.

Barrière's methods introduce titanium and zirconium, both of which re exceedingly difficult to separate afterwards.

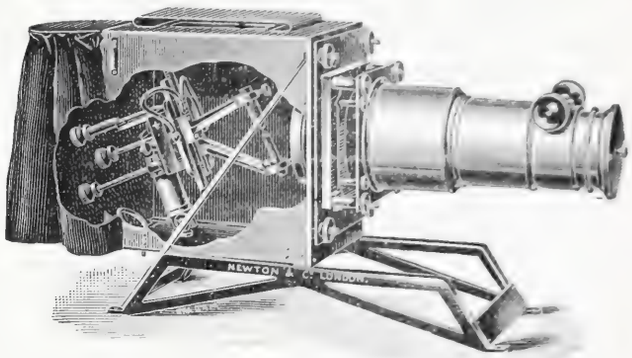
To obtain the pink colour of the erbium oxide, it must be exceedingly ure. One can easily be misled by the colour of these rare oxides when n combination. Some when alone are white, yet when combined are f a dark colour, even brown.

In order to obtain a larger sample of "lucium" to work with, I took one kilo. of an average of several hundred samples of North Carolina monazite sand, carefully following Barrière's method, making, however, each separation thoroughly, and failed to obtain any earth answering to the reactions of "lucium," only getting as a result less than one per cent. of the mixed oxides of the yttrite group of a buff colour, and very freely soluble in dilute acids.

Since making these experiments, much work has been done by Crookes and others to prove that "lucium" is not entitled to a place in the list of elements, but is impure yttrium. WALDRON SHAPLEIGH.

THE "INDIAN" LANTERN.

THIS new lantern has been designed by Messrs. Newton & Co., of 3, Fleet-street, for use in the tropics and in hot, damp climates, where wood and iron warp and rust. It is made entirely of brass, and is fitted with the finest long-range lenses, suitable for either electric or lime light,



and the construction is such that the entire cover can be removed in a moment without disturbing the light or the optical portions. This lantern is specially intended for use in India, and the one from which the above illustration was made is just being sent to the Royal College, Ceylon.

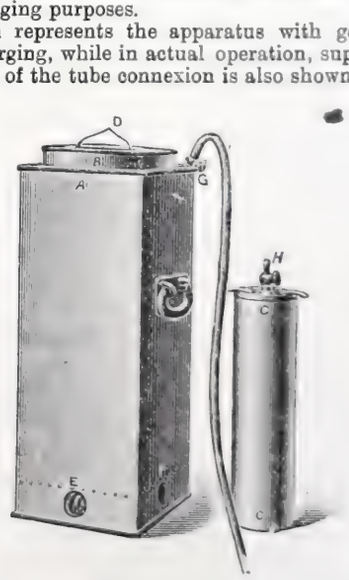
THE "ABINGDON" ACETYLENE GENERATOR.

R. J. MOSS & Co., CONDUIT-ROAD, ABINGDON.

THE principles upon which the above generator is constructed, may be understood from the following brief description:—

A, is the water cistern; B, the gas holder; C, the generating chamber; D, the central tube from which C has been removed for recharging; E and F, taps to let off the water from condensing chambers; G, the gas outlet; H, air tap for charging purposes.

The illustration represents the apparatus with generating chamber removed for recharging, while in actual operation, supplying light to the two burners; part of the tube connexion is also shown.



The water tank is made square, partly to do away with guides and partly for convenience in transit; when the gas is generated in C, it passes into B, through a down and up pipe connected by a condensing chamber, but is prevented from returning by a water trap; this is one element of safety, the volume of gas—even though small—being divided into two parts, each so small that an explosion (even if possible) could do

no serious damage. This water trap also cools and purifies the gas. When sufficient gas has been made, the gas holder, B, rises, lifting, at the same time, the carbide in C, when the active production of the gas ceases, to be resumed when the consumption allows the gas holder to fall.

Should any excess of pressure arise in the generating chamber, that will immediately rise from the gas holder and relieve it, returning to the normal position when the excess of gas has passed into the holder.

The apparatus can be started full working (two burners) in about two minutes, as nearly all air is expelled in the action of charging, and it can be recharged (if necessary), when in use, without interfering with the supply of gas or putting out the lights. The entire apparatus is made of twenty-four gauge iron, and afterwards galvanised; this makes it perfectly sound, and obviates all risk of leakage, while the increased weight gives a good regular pressure. An arrangement for extending the sides of the water cistern prevents the water spilling over.

For lantern work, two sizes are made: 8 inches square by 21 inches high, charge, 1 pound, and 9 inches square by 24 inches high, with a charge of 1½ pound; the latter has supplied eight burners at once for about three-quarters of an hour, so it is suited for photographic work.

PRODUCING PICTORIAL EFFECTS ON A VERTICAL SCREEN.

Mr. E. Sandow is the patentee of this invention, the principal object of which is to exhibit a picture of any person or persons, or other figure or object, upon a vertical screen or similar surface, so that a large number of persons seated in a darkened room in front of the screen or surface can see the picture the right way up, either by transmitted or reflected light, and the person, figure, or object, can move or be moved if desired, the effect being then a moving or "living" picture.

The invention consists in combining a screen, a lens, and a mirror or reflector in a special manner, the reflector being placed immediately above the person or persons, or object or objects to be exhibited, and reflecting the picture the wrong way up; the lens is so placed with regard to the reflector and the vertical screen or surface, as to throw the picture from the former upon the latter the right way up.

When the picture is to be seen by transmitted light, the screen or similar surface is transparent or translucent, and fixed vertically, or nearly so, in front of the lens, which is preferably inclined slightly from a right angle with regard to the reflector or mirror, the latter, as before stated, being fixed immediately above the person or persons, or object or objects, to be exhibited; the lens is preferably set so as to receive the picture reversed by the reflector, and throw an enlarged and well-focussed image right way up upon the screen.

When the picture is to be seen by reflected light, the person or persons or object or objects, are (by preference) behind the spectators, and hidden by a suitable partition or wall, the lens alone supplying light to the screen.

Fig. 1

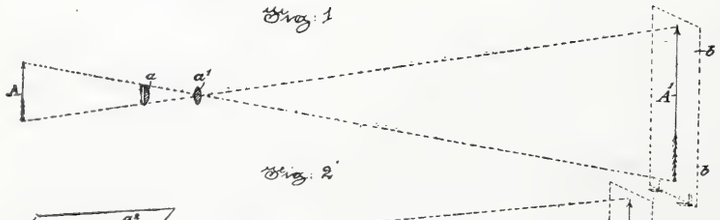


Fig. 2

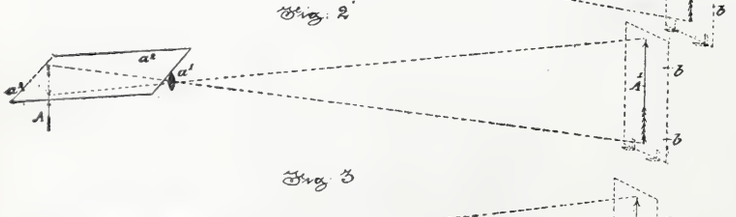
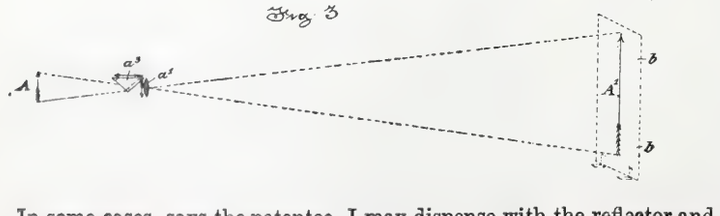


Fig. 3



In some cases, says the patentee, I may dispense with the reflector and make use of a combination of two lenses or a prism, and a lens to cause the picture to appear right way up upon the screen.

For this purpose I combine two plano-convex lenses (or one plano-convex and another suitable lens), or a lens and a prism, set in a suitable tube or the like, and adjusted to such a distance apart as will effect the purpose of throwing an image upon a vertical screen right way up, the rays of light coming directly to the lens nearest to the person or persons, or object or objects, to be exhibited. In the case of a lens and a prism, the latter is the nearer to the person or object to be exhibited, and as a large prism will be required for the purpose, I propose to use a hollow prism of glass filled with water or other suitable liquid.

The accompanying diagrams will illustrate clearly the invention.

Fig. 1 shows the application of a plano-convex lens, *a*, reversing the image from the object, shown by the arrow, A, the lens, a^1, reversing again and enlarging it right side up on the screen, *b*, as indicated at A^1.

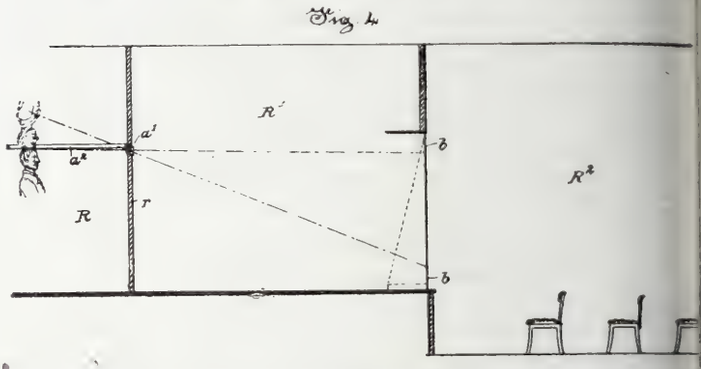
Fig. 2 shows the image from A reversed upon a mirror, a^2, the lens, *a* reversing it and enlarging it right side up as before described.

Fig. 3 shows the image from A reversed first by a prism, a^2, the lens a^1, throwing it right side up on the screen, *b*, as before described.

Fig. 4 shows the adaptation of my invention to the exhibition of a object (say the head and shoulders of a man) upon a translucent screen.

The man stands in a brilliantly lighted room, R, in the wall, *r*, which is fitted a suitable lens, a^1, to receive the image of his head an shoulders, and project it upon a screen, *b*, fixed at the required distanc from the wall, *r*, in an adjoining room, R^1, which must be darkened. Th

Fig. 4



spectators may be in the same room (or in a separate darkened room, R as shown) at the other side of the screen, *b*, which, as before stated, is i the case illustrated, translucent; but any one in the room, R^1, can also of course, see the image on the screen, *b*, by reflected light.

The lens, a^1, may take the image of the man's head and shoulders in verted from the mirror, a^2, as shown on figs. 2 and 4, but it will b evident, without further illustration, that the image may be take inverted from another lens, as illustrated by fig. 1, or from a prism a seen at fig. 3.

It will be, of course, understood that the distance from the lens, a^1, t the object and to the screen, will vary according to the amount of enlarge ment required and the focus of the lens, and that the size of the len or lenses or prism will vary as required, as will be evident to any one wh is acquainted with optical instruments.

Mr. Joseph Lunt, B.Sc., Director of the Photographic Section of th British Astronomical Association, has been appointed Assistant at th Cape Observatory, to take charge of the telescope and spectroscope recently presented to the Observatory by Mr. McClean for the purposes researches in stellar spectroscopy.

Newton's Supplementary Lantern-slide Catalogue.—Messrs. New ton & Co., of 3, Fleet-street, have submitted to us their new Suppl mentary Lantern-slide Catalogue, in which many interesting new sets lantern slides for lecture purposes are included. *Veterinary Scienc* Tissot's *Life of Christ; English, Scotch, Welsh, and Swiss Scenery* Saville-Kent's *Naturalist in Australia;* Lodge's *Birds and Birds' Nest* are among the subjects.

Incandescent Lights for Municipal Purposes.—A report which shoul be of considerable interest to municipalities whose street lighting is b means of gas, has been issued by the Superintendent of Street Lightin at Liverpool, Mr. Bellamy. Up to a recent period the street lighting Liverpool was exclusively by gas. In the leading thoroughfare electricity (provided by the Corporation) has taken its place, but else where gas lighting is still relied upon, and in regard to this matter th Superintendent reports upon the comparative results arising from the us of the ordinary flat-flame burner and the incandescent burner. I brilliance of illumination the incandescent lamps are superior to the olde type, the consumption of gas is less, and the total cost of street lightin is reduced. The conclusion, says the Superintendent, is that a genera extension of the system seems irresistible.

Messrs. Newton & Co., of 3, Fleet-street, E.C., inform us that i future they propose making special arrangements for the convenience o their trade customers, and will place their collection of educational an sacred slides at the service of the trade. With this object, a specia catalogue is being published, bearing only a trade mark on the cover an without the name or address of the firm, while the slides will also b published bearing only the trade mark, as in the case of other firm supplying the trade. Most of the subjects are very exhaustive, physi ology, art, geology, technical, &c., being each illustrated by som hundreds of pictures, while there are over two thousand historica slides, and the Scripture slides, which are particularly fine, numbe several hundreds. The new catalogue will shortly be ready, and will b sent to any one applying who encloses his trade card.

MONTHLY SUPPLEMENT

[TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*October* 1, 1897.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

MR. WILLIAM A. EDDY, who has a well-deserved reputation for his experiments in kite making and flying, has devised what is termed a "vistascope"—an instrument which enables persons on the ground to view the surrounding country with almost the same effect as if they were at the elevation of the kite. The vistascope looks something like a huge magic lantern. It is designed on the lines of the ordinary camera obscura, but the pictures are thrown from a mirror, set in the top upon a sheet of semi-transparent paraffin paper. This does away with the reversed effect of the ordinary camera obscura. By lying on his back with his feet toward the view to be seen, the observer sees the landscape stretched before him in its proper condition. There is, moreover, a peculiar effect of being in the air on a level with the vistascope, and looking out over a level stretch of country. The apparatus recently used by Mr. Eddy measures $5 \times 2\frac{1}{2}$ feet, and was carried up by a team of Eddy kites reinforced by a Hargrave box kite. The vistascope was sent up to a height of 150 feet. Mr. Eddy lay flat on his back with a powerful field glass, and looked up at the reflector of the camera obscura. He was able to see objects with great clearness; houses and trees a mile and a half distant were distinctly seen. The kite cord was let out until the vistascope was 300 feet in the air, but the trials were less satisfactory, because of the swaying of the kite line, which rendered it extremely difficult to follow the motion of the apparatus with the field glass.

* * * * *

Is the fool killer dead entirely? asks the editor of the *Photo-American*. I read the other day of a professional photographer who wanted to make a picture in the store of a prominent New York City merchant, and nearly blew the place up. It seems he had a lamp, one of those lamps that are meant to burn pure magnesium only as most lamps are, and, although cautioned not to use anything but pure magnesium filings, he went and brought the compound, loaded his old lamp chockful of it, and took the motto on our silver dollar for his guidance. The newspaper accounts differ somewhat, of course, but all agreed that he scared himself, and all in the place, out of their wits, came near getting arrested as an anarchist, and warmed things up pretty thoroughly in that store for the day. The moral is—but what's the use of any moral?—people will do this sort of thing, and that's all there is about it.

MESSRS. FUERST BROS., 17, Philpot-lane, E.C., send us the latest price-list of Lumière's cinematograph, &c. A list of 600 film views is given, the photographs having been taken in all parts of the world, and the prices of many other of Lumière's specialities are included. This list should be specially useful to lanternists for reference during the winter season.

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MR. HORATIO NELSON KING, of 4, Avenue-road, Goldhawk-road, W., sends us his latest list of stereoscopic slides and transparencies. There are upwards of 5000 subjects, and many popular additions are constantly being made to the series. The qualities of the various classes of Mr. King's photographic productions are, of course, pre-eminently good.

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WHAT is stated to be the largest acetylene-gas installation yet laid down has been put into operation at the Niagara University, Niagara Falls. There are altogether 287 lights, which replace those which formerly burned gas produced from crude oil. The superior efficiency of acetylene to the old illuminant may be estimated from the fact that the number of acetylene gas jets, giving superior light, as against the number previously employed with oil gas, is in the proportion of eight as against thirty-two. The cost of maintaining the acetylene plant will be about one-third that of the crude oil plant.

* * * * *

WE are glad to hear from a Glasgow correspondent that the local Exhibition bids fair to prove a great financial success. The lantern lectures are drawing crowded houses nightly. Among recent lecturers have been Mr. F. A. Bridge (*Norway*), Mr. W. C. Tait (*A Holiday in Yorkshire*), Mr. G. G. Napier (*Courts and Castles of Queen Victoria*), Mr. T. D. Stockdale (*A Visit to Palestine*), Mr. P. M. Chalmers (*The Abbeys and Cathedrals of Scotland*), Mr. G. Middleton (*Brittany and the Bretons*), Mr. T. N. Armstrong (*The Clyde*).

* * * * *

AT the Royal Aquarium a series of animated photographs of a contest between two prize-fighters, Corbett and Fitzsimmons, is being shown. That fight might, and probably would, we are told, never have been brought to a head but for the invention of the kinetoscope, or the animatograph, or whatever one cares to call it. In fact, it is said that a certain speculator spent something like 50,000*l.* in getting these two pugilists over the debating Rubicon into the sphere of actual hostilities in order that the camera might record their actions. His efforts were crowned with success, and now the British public may see how the great fight was fought, on films which measure over two miles in length and contain about 165,000 pictures. Apart from the ethics of prize-fighting, the show is an extremely interesting one, for it is the most ambitious effort yet made in the animatographic line. The figures are life size; every movement is, as a rule, clearly defined. As for the photographs themselves, they eliminate all the brutality of pugilism; you

see nothing of the effects of fighting: no blood and no bruises, only two men chasing each other round a twenty-four feet ring, and occasionally striking out at each other with, except in two instances, no visible result. These two instances are when Fitzsimmons is knocked down, and leisurely waits until the ninth second has been sounded on the gong by the timekeeper before he gets up; and the second when Corbett receives a similar compliment, and does not rise until after the ten seconds have been counted. In the first few rounds the combatants spend most of their time in embracing each other. Things are livelier when the rounds get into double figures, but there is nothing in it which could harm the morals of a Sunday school, as far as the pictures go.

LANTERN MEMS.

"NEXT, please!" This is still often heard at lantern entertainments when a new slide is wanted by the lecturer, notwithstanding the many kinds of signals available, and, with a view to its prevention, a very ingenious automatic slide-changer has been invented that gives the lecturer control, provided some one inserts the slides in the carrier. It is an electrical apparatus, so distance is only regulated by the length of the insulated wire. The dissolving is performed at the same time as the slide changes.

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WHETHER it will be possible to obtain an automatic lanternist at some future date must be left for time to show, but at present brains are wanted as well as hands, even when the system of marking slides is simple and the slide-carrier a good one. The electric light for optical lanterns lends itself to this end, and, if an incandescent electric lamp can be obtained with sufficient power for public entertainments, without having too large a filament to impair the definition, doubtless some inventor will introduce a scheme that, after once the series of slides has been placed in the magazine slide-holder in the right order, and the lantern adjusted as to light and focus, the change of slide and cutting off of the light, or dissolving, can all be done at the will of the lecturer from the platform.

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THE number of different cinematographs and apparatus for producing animated photographs is growing apace, and lanternists and entertainers should have no difficulty now in selecting one to suit their requirements. If they already have a good optical lantern, they can get the attachment for the animated photographs at prices from 10*l.*, while films of really good quality can be purchased at much reduced prices to what prevailed last season. There is no question that, as long as the subjects are selected with judgment, so as to be interesting, and are of highest technical excellence, these living photographs will be popular; in fact, as I said before, "they have come to stay."

* * * * *

MODIFICATIONS in incandescent gaslight burners are likely to be of service to the lantern world, and already one has appeared, the "Denayrouze," which promises well. No chimney is required, and, if the large flame does interfere with the definition in projection, the system is such that, with some modification, an ideal light for small-size discs will be available. It seems, as far as I can judge from a cursory examination of the light and burners, a question only of the perfect combustion of air and gas, and any one who can produce the most perfect Bunsen burner can, with a Welsbach mantle suspended over it, get a grand light.

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INJECTOR jets seem likely to replace the blow-through pattern where house gas is used direct from the main in connexion with oxygen from a cylinder, and those interested in lantern matters who have not yet seen them at work should take an early opportunity of doing so. It should be a most useful light for all purposes except very large halls.

THE work of professional photographers has been very heavy of late, developing amateur's negatives, and printing the results of the snap-shotting during the holidays. I think personally that more cameras were in use this season than ever; now and then a seriously disposed photographer would have his stand camera, but the majority were of the hand order. In France, where I spent most of my holiday, I found that the cameras were of the "pronounced" type, essentially French, except the holder was an American or Englishman. How is it that the French-speaking race seldom patronise the English productions? They are not, I find, slow at adopting any really good points in English work whether patent or not, but they are not cosmopolitan in their ideas of trading, and seldom purchase anything unless it is "made in France."

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ACCORDING to a daily contemporary The Cold Ventre Lime Company, of Chatburn, have succeeded in producing the first carbide of calcium made in England for commercial purposes, and the event is hailed as of vast importance to Lancashire, and, indeed, all England.

G. R. BAKER.

NOTES ON POLYCHROMATIC PHOTO-MICROGRAPHY.

[Journal of the Royal Photographic Society.]

THE value of photography as applied to biological research has increased markedly during the last decade by reason of the perfection of technique in the manufacture of the gelatino-bromide dry plate, rendering easily possible results which were previously accomplished with great difficulty, if at all.

This is most evident in photo-micrography, in which using the product of the highest skill of the optician would not suffice to produce the required results without the aid of the colour-sensitive plate. By the combination of plates sensitive to colour with objectives and eyepieces, either achromatic or apochromatic, it is possible, when properly illuminating the object, to produce photo-micrographs in monochrome of the highest excellence. In many cases it would be quite unnecessary to seek to improve on such results, the monochromatic rendering of the various stains of the specimen conveying to the observer a correct impression of the object; but there are some specimens which have a special value due to their colour contrast, and, while isochromatic photo-micrography can render these in monochrome, there is often a desire, as evinced in some of our text-books by coloured illustrations, to add the value of colour differences to those of form, light, and shade. Such coloured illustrations are, however, open to the objection that they are products of the direct hand work of man, being either lithographs or separate block prints in colour, and frequently, in addition, being reproduced from a coloured sketch or hand drawing. If these objects could be as well rendered by photo-micrography, and printed in colour by mechanical means, without the intervention of hand work other than that pertaining to such press work as involves the application of colour by roller to a printing plate, we should have a coloured object rendered, both as to its form and colour, by photo-micrography, and hence free from the personal equation error common in varying degree to all freehand drawings and reproductions of microscopic objects.

While the reproductions of gross objects in colour by the aid of photography and mechanical colour printing has been accomplished commercially for a number of years, the reproduction of objects in colour by the aid of photo-micrography has not been successful, some even asserting that it could not, and probably never would, be done, because the images of an object, as projected by the different colours of the spectrum, were of different sizes, and hence never could be made to register by any practicable method. This is an interesting and plausible theory, but, nevertheless, an incorrect one; for I have found that, with adequate apparatus and exercising due care, the production of polychromatic photo-micrographs is quite possible, and, to one accustomed to working in photo-micrography, not exceptionally difficult.

The initial experiments were made during the winter of 1895–96 with old achromatic objectives, giving a magnification of from 30 to 190 diameters, the results having since been shown at the Academy of Sciences, New York; the Pathological Society, New York; and the Royal Photographic Society, London. The three-colour process of M. Ducos du Hauron, as used by Mr. Edward Bierstadt, was chosen on account of the accuracy of the results in ordinary photography. The later experiments were on the same general lines as the first, but were directed specially to obtaining results at high magnifications, and for that purpose a Zeiss 2 mm. apochromatic oil immersion objective was employed, the achro-

ic condenser being at the same time connected with the back of the e by immersion oil, so that the full aperture of the objective was ised.

use as the source of light the electric arc, the feeding mechanism of ch is controlled by a shunt coil, so that the carbons feed together ry few seconds; the crater is thus maintained in the centre of the d until the carbons are consumed. The light is modified by dia-agms, and sometimes by ground glass, and is then passed through the our screen to the condenser, and thence through object, microscope, l camera to the sensitive plate. The colour screens are collodion films ined with Hoffman's violet, malachite green, and a mixture of eosine B. l aurantia, and, as will be noticed, are complementary to the three mary colours with which the final print is made. For the negatives oduced with the orange-red and the green screens, isochromatic plates e used; that made with the violet screen is non-isochromatic. From ese negatives bichromated gelatine printing plates are made, and inted on a lithographic press, the yellow print first, the red super-posed on it, and the blue on the other two.

It is evident that, from first to last, the registration, or exact coincinence, of all parts of the different coloured images must be perfect. As gards the printing, the registration is obtained by the ordinary methods use for such work, and is not more difficult from photo-micrographic gatives than from others. On the other hand, the registration of the agnified images of the object in the camera presents the main difficulty, the relations and positions of all parts of the installation must remain e same throughout the time necessary to make the three exposures. hese results, with the higher powers, are only to be obtained by ercise of the utmost care. The image and the light are first centered id adjusted, the focussing being done through a yellow screen; the llow screen is removed, and then, in succession, the orange-red, the green, id the violet screens are substituted, and a negative made with each.

M. du Hauron has recently pointed out in regard to ordinary photo-raphy that some subjects could be rendered quite well enough by two olours. In photo-micrography this is a distinct gain, as frequently two olours are all that are in the original; and the gain in time, in lessening ie danger of non-registration, and in cost, is of great advantage. The lustration accompanying these notes† of *Bacillus tuberculosis* in sputum t 1000 diameters, stained with carbolic acid fuchsin and aqueous solution f methylene blue, was produced in this way. Having originally been aken and printed in three colours, it was afterwards, for the purposes of his article, printed from the red and blue printing plates only.

EDWARD LEAMING, M.D., F.R.P.S.

SOME REMARKS ON LANTERN SLIDES.*

A METHOD OF DEVELOPING: PARTIAL AND LOCAL TONING.

General Remarks.—The past twelve months of the Camera Club of New York will, without question, be known in the pages of its annals as the 'Lantern Slide Year;" for in truth, as can be verified by the pages of the old journal, never before was there so much work done or so much interest shown in this most peculiarly fascinating branch of photography. Slide-making originated in the United States, it having been invented, as is claimed, by Langheim, of Philadelphia, some fifty years ago. It at once became popular, and continued to fascinate, not only those interested directly in the production of slides, but old and young who simply wish to see pictures in an agreeable way. Many of our best amateurs devote themselves exclusively to this branch of work, our Mr. Fraser being a notable example, notwithstanding the fact that most of the leading pictorial photographers of Great Britain and the Continent look down upon slide-making as outside the "art limits," and therefore beneath their artistic dignity. It has become an accepted fact among them that the process is purely mechanical, and that at best the tonality of slides was incorrect. As for the declaration that slide-making is purely mechanical, permit me to say that, after a conscientious winter's work in this line of photography, I have come to a different conclusion, and claim that the technique of slide-making *may* be quite as interesting as that of the known printing processes, even including the gum methods which are now coming into vogue. Of that more anon. As for incorrect tonality, in most cases that is due to the lack of knowledge and skill on the part of the slide-maker, who has not given the matter enough study, or who perphaps does not quite grasp the material with which he is working. In order to properly appreciate a "picture slide," and in this talk remember I am only referring to "picture slides," the same must be shown under the exact conditions as prescribed by the maker, for the latter, if thoroughly at home in his work, will make his slides to suit the conditions of light and enlargement set down by him before he begins his picture. It is this factor that makes slide-making so unsatisfactory, and discourages the earnest worker when he sees his slide on strange screens and quarters. Suppose I made my slide to be enlarged ten times and shown with a light whose intensity is L, so as to give the desired effect, and it is then shown enlarged to twenty *t* and a light with an intensity of L, what is the result? Entirely false values and consequently a false impression. But does this not hold true of prints to a certain extent? How many gems are thoroughly ruined in exhibitions by poor hanging and still more miserable lighting. We see we must make the best of existing conditions, and only show our work there where we may expect reasonable attention to our intentions.

* *Photographic Society's Journal*, *August*. 1897.
† Extract from *Camera Notes*, New York, vol. i., No. 2.

STANDARD OF SLIDES IN THE CAMERA CLUB, NEW YORK.

The standard of the slides made in our Club is high, for the judging on test nights has been unusually severe, even hypercritical, according to many members who do not understand the motives of the Judges. Just criticism, though it may seem harsh at the moment, is exceedingly healthy for the welfare of the Club. There is much, too much, back-patting in the ranks of photographers. Honest criticism from capable men ought to be sought, and, when given, ought not to be condemned as discouraging new talent and hurting the feelings of the spoilt children in the ranks. The Judges appointed for the year judged slides for their quality, by which was understood the correct rendering of tone values in connexion with the other technical requirements of a slide. "Clear glass for high lights and transparent shadows" did not constitute a perfect slide, as the old-timers imagined. A first-class slide, we will not speak of perfection, very rarely contains clear glass, the lack of tone in any part of it being a serious defect. On the contrary, we have seen instances in which a faint veil over the whole slide would have been a great improvement, the subject presented thus gaining in atmospheric delicacy and charm. It is well to remember that veil and fog are not synonymous in this case. Fog is always to be avoided in slides. A luminous body only should be represented by clear glass. We fully appreciate that our audiences, nevertheless, still go into raptures over the so-termed brilliant slide, by which is meant one lacking in all medium gradation; in short, a black-and-white one. Such a slide is an abomination to the refined eye, and fortunately our precepts are bearing fruit among our members, and will therefore in due season influence those who come in contact with them; that is our audiences. A matter rarely considered by slide-makers is that of colour, and we are therefore confronted with bright red snow scenes, glaringly pink landscapes, blue architectural interiors, &c., which, though perhaps beautiful in all other respects, are entirely ruined by this shortcoming. This defect is often due to the desire to obtain softness at the expense of colour, for we all know that a soft slide is, as a rule, produced by a long exposure and a weak developer—the two factors which are also necessary in obtaining warm colours. In order to control the colour of a slide without sacrificing its gradation and quality, it is often necessary to resort to special toning methods. It is upon this matter, and also on my own method of developing slides, that I wish to dwell. The slides made by me during the past year were all produced in the manner to be described, and by special request I give you my working methods, so that any one may be enabled to obtain similar results.

MY METHOD OF DEVELOPING SLIDES.

Having given the plate a very full exposure, it is developed in the usual manner with any developer (I personally prefer hydroquinone), with the difference that development is not stopped until the image has totally disappeared when examining the plate by transmitted light. It is then rinsed under the tap as usual, and placed in the hypo bath until thoroughly fixed. Upon examining the fixed slide, it will be seen that it is not only so thick that you can hardly recognise the picture, but that it lacks all gradation, in being muddy and flat. But this condition is necessary for future operations, all of which take place in broad daylight. On a table place two white porcelain dishes. The one, which we distinguish by calling it A, should contain a one per cent. solution of ferricyanide of potassium, and the other, B, a very dilute solution of hyposulphite of soda and ferricyanide of potassium, say:—

I. Ten per cent. solution of hyposulphite of soda.
II. Ten per cent. solution of ferricyanide of potassium.
For use, take 100 parts of I. and 15 drops of II.

These baths must be renewed occasionally, as they deteriorate in the light.

In each dish place a small camel's-hair brush and a wad of cotton, which latter may be shaped at will to suit the purpose for which it may be intended. If possible, have the table near running water, otherwise have a pailful at hand, as plenty of water is essential for the delicacy of some of the operations to be performed.

LOCAL REDUCTION IN ORDER TO BUILD UP TONE VALUES.

As before stated, in examining the fixed slide by transmitted light, very little of the image will be visible. In order to facilitate matters, bring the slide *directly* from the fixing bath *without previous washing*, into dish, A, in which it will be gradually reduced. Stop the reduction as soon as the image is fairly distinct. This is done by plunging the plate into water, thus stopping all chemical action. The slide is still very thick and flat, but it is now in a satisfactory condition for local treatment and the ultimate thinning down to the desired density.

In this state the slide is placed in dish, B, and local reduction by means

of the brush is begun. This process must be very gradual, so that it be in our power to alter our relative tone values or gradation at will. You notice in this local application of the reducing agent we in reality have the reverse of brush development in platinotype printing, with even a much greater lee-way. The process of producing slides by this method is highly interesting, for effects not otherwise possible can, with a little skill, be obtained.

It is by this method that some of those striking snow scenes, shown during the winter, were produced. Originally the slides of these were considerably overtimed and over-developed, and then reduced in the above-described manner. Between every stroke or two of the brush it is well to rinse the plate, so that the strokes do not show in the ultimate result. No brush strokes ought to be visible when the slide is thrown on the screen; if any be detected, the slide is a failure and ought to be discarded. With a little skill and practice, this method is very simple and safe, and any one having succeeded in mastering it will never resort to any other method of producing slides.

Naturally, it is essential to know something of tone values, as the resulting slide might otherwise be ludicrous in its effect. This process of developing a slide is necessarily very slow, forcing being at no stage admissible, as it would ensure certain failure.

The Use of Formalin.

In winter the gelatine is sufficiently tough to withstand this seemingly rough treatment, but in summer it is well to soak the slide before the brush reduction is begun in a very weak solution of formalin for about a minute and then rinse thoroughly. The solution used by me is 1000 parts of water to one part of formalin. Sometimes the resulting colour of the slide produced in the above-described manner is objectionable, and possibly rather uneven. To overcome this defect, the slide must be toned in a suitable bath. Among the many experiments made by me, the following will interest you most:—

Toning.

In many cases it is desirable to colour a slide to a pure blue, or perhaps only a suspicion of blue. An absolutely reliable method to obtain this colour is to use the following bath:—

Blue.

1.	Sulphocyanide of ammonium	200 grains.
	Water	32 ounces.
	Carbonate of soda (granular)	2 grains.
2.	Chloride of gold (brown)	15 ,,
	Water	1 ounce.

For use take two ounces of 1 and four drops of 2, always remembering to add 2 to 1, and *never reversing* the operation. This amount of solution will tone at least one slide to a perfect blue. The toning bath, in order to work satisfactorily, ought to have a temperature of 72° to 76° F. Using the bath at a lower temperature results in failure, as the toning proceeds too slowly and unsatisfactorily in other respects. A higher temperature will hasten toning, but the gelatine of the plate is apt to be attacked in a most disagreeable way.

To judge the process of toning, it is necessary to examine the slide by transmitted light, using daylight if possible. A thoroughly toned slide will have a pure blue colour when examined in that way. According to my experience, it is advisable to tone reduced slides after they have been dried, especially in such cases in which only partial toning is to be used. As for the density of toned slides, let me say that those toned with the above bath do not increase in density perceptibly.

Green.

In order to obtain a green slide, the following treatment is best:—

1.	Oxalate of iron	20 grains.
	Ferricyanide of potassium	15 ,,
	Water	32 ounces.
2.	Chromate of potassium	5 grains.
	Water	16 ounces.

Bathe your slide, which in this case must be somewhat lighter than the desired result, in solution 1. In this bath the colour will turn to a dark blue. From this it is placed in solution 2 for a minute and then dried. When dry, the slide will be a bright green.

Bartolozzi Red.

Bartolozzi red is obtained by using the following bath:—

1.	Ferrocyanide of potassium (yellow prussiate)	15 grains.
	Water	16 ounces.
2.	Nitrate of uranium	30 grains.
	Sulphocyanide of ammonium	150 ,,
	Citric acid (crystals)	30 ,,
	Water	16 ounces.

For use, take one part of 1 and one part of 2, and place your slide, which must be first thoroughly soaked, in this solution. It will quickly assume a beautiful Bartolozzi red colour. In many cases the whites are stained in colouring the slides in this way, and, in order to remove the same, dip them into—

Carbonate of soda	15 grains,
Water	32 ounces,

for a moment, not longer, and the stain will disappear. After this operation proceed to wash.

Partial Toning.

In using the gold toning bath some beautiful effects of colour may be obtained by so-called partial toning. These colours are obtained by dipping the slides into the toning solution for a short time, and then examining them by transmitted light. The combinations of the original ground colour of the slide and the partial deposit of the gold, which is blue, give us quite a range of purples, blues, reds, greys, blue-blacks, &c., the colour depending upon the ground colour and the length of toning. Many of the snow scenes, before mentioned, were treated in this way.

Local Toning with Different Baths.

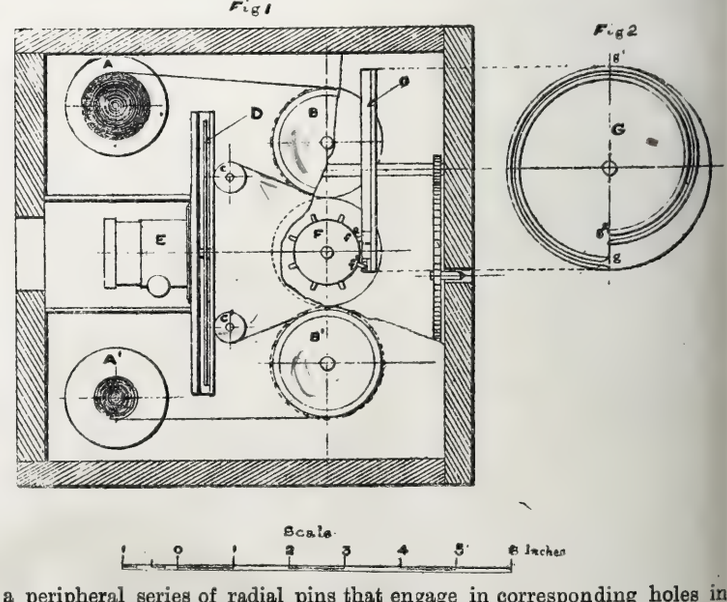
While experimenting with the above-mentioned and many other colouring processes, it struck me to try and colour slides by using these baths on one and the same slide locally. In order to succeed, quite a little skill in handling the brush and the various solutions, as well as the water faucet, are essential. And even at that, most slides are apt to be spoiled by the colours running into each other. My mode of procedure is as follows: I take a dry slide, dip into water so as to simply moisten the surface of the gelatine, and then apply the gold toning solution with a small or large brush, as the occasion may require, to those portions of the slide which are to be coloured to blue, and shades of the same, and also the blue-blacks and purples, all of which are obtained by the sulphocyanide bath. After these portions of the slide have been coloured satisfactorily, an operation which is most trying to one's patience and nerves at times, the other portions are treated successively with the various remaining baths. In most cases the results are exaggerations and also crude; nevertheless, such a slide, especially from a chemical point of view, is of great interest. In certain instances, however, such local colouring or toning is of great effect and beauty, especially if the original ground colour of the slide be kept, and another colour simply suggested in parts. Some of the Venetian scenes in which water, sky, and a few houses and gondolas make up the picture, treated in this manner, show up beautifully.

As a general rule, the monochrome slide is preferable to those coloured by any means whatever, especially for pictorial purposes. Nevertheless, an occasional suggestion of colour, if used very discriminately and with understanding, relieves the monotony of an evening's entertainment of slides, always remembering that by coloured slides I refer to photographically coloured ones, and not those tinted by hand with aniline dyes. Those can hardly be included within the limits of legitimate photography.

Alfred Stieglitz.

HARRISON'S APPARATUS FOR ANIMATED PHOTOGRAPHY.

In this apparatus, in taking photographs in series, the film or ribbon is unwound from a spool, A, by a roller or drum, B, provided at each side with



a peripheral series of radial pins that engage in corresponding holes in the edges of the film or ribbon.

From the roller or drum, B, the film or ribbon is guided by rollers, C and C^1, past a shutter, D, which revolves behind a lens, E, so as alternately

cover and uncover the latter. After passing round a second roller or um, B[1], of the same diameter as the drum, B, and also provided with two ts of radial pins that engage in the aforesaid holes in the film or ribbon, e film or ribbon is wound upon a spool, A[1], which is rotated by means of spring or other suitable driving mechanism. The two pin drums, B and , are connected together, by the three toothed wheels indicated in dotted ies in fig. 1, so as to move simultaneously, with equal velocities and the same direction. To give the requisite intermittent movement to e drums, B and B[1], and thereby to the film, there is fixed on the axle of e intermediate toothed wheel a wheel, F, provided with a suitable umber of teeth or pins, of which there is always at least one engaged in grove or channel formed by ribs projecting from one surface of a disc, G. his disc, which is shown in elevation in fig. 2, is mounted on an axle t right angles to that of the pin wheel, F, and is continuously rotated by and or by any suitable mechanism. The aforesaid groove or channel, om one end, g, to the other, g^2, subtends 360° at the axis of the disc, G. he portion of the groove or channel from g to g^1 subtending 180° at the xis of the disc, G, is coaxial with the disc, but from g^1 to g^2 the groove r channel gradually approaches the axis of the disc, the distance between he ends, g and g^2, of the groove or channel being equal, or approxima-ely equal, to the radial distance between consecutive pins in the vheel, F, so that, if, as shown in fig. 1, two consecutive pins, f^1 and f^2, f the wheel, F, be simultaneously engaged in the two ends, g and g^2, of he groove or channel, and the disc, G, be rotated in the direction, as seen rom the left-hand side of fig. 1, opposite to that of the hand of a watch, hen, during the first half revolution, the wheel, F, will be kept stationary as a consequence of the engagement of the pin, f^1, in the portion, $g\ g^1$, of he groove or channel, whereas, during the second half revolution, the pin, f^1, will be caused by the outer wall of the non-coaxial portion, $g^1\ g^2$, of the groove or channel to move into the position shown as occupied by the pin, f^2. The shutter, D, is connected by gearing to the disc, G, in such a manner that it will synchronise therewith so as to expose the film or ribbon during its period of rest and to cover the lens, E, whilst the film or ribbon is in motion.

It will be obvious, says Messrs. Harrison, that, although we have shown the groove or channel so formed as to make the periods of rest of the film equal in length to the periods of motion, any other desired ratio between the lengths of the periods of motion and the periods of rest may be secured by suitably determining the relation between the angle subtended by the portion of the groove or channel that is coaxial with the disc and the angle subtended by the portion thereof that is not coaxial therewith.

Means according to this invention for giving the required intermittent movement to the films or ribbons of apparatus for taking and exhibiting photographs in quick succession present, over the means for this purpose hitherto known to us, the advantages of allowing the apparatus to be constructed in a more compact form and enabling the changes from rest to motion and *vice versâ* to be effected less abruptly and back-lash to be thereby avoided.

VIEWING STEREOSCOPIC PHOTOGRAPHS ON THE SCREEN.

Mr. T. C. Porter is the author of an invention which enables a number of persons assembled in one room to view pictures in stereoscopic relief and otherwise, projected by optical lanterns or similar apparatus. It consists first in projecting on to a screen two stereoscopic pictures, or a series of such pictures, alternately and in rapid succession, and in providing means whereby, of the two pictures or sets of pictures projected, one eye sees one picture or set of pictures only, and the other eye sees the other picture or set of pictures only.

"One method of carrying my invention into effect is as follows," says Mr. Porter:—

"In front of the two objectives of the lantern or lanterns I mount a revolving disc, having portions removed forming slots or apertures, so that, as the disc revolves, first one picture and then the other is projected upon the screen, one picture only being projected at a time. This disc has a second set of slots or apertures arranged circumferentially in two concentric circles at such a distance apart that each eye of an observer may view the projected image through one of the two circles of apertures forming the said second set; or the slots or apertures which serve for the lantern objective may also serve for the eyes of the spectator. These slots or apertures are all so arranged in relation to each other that, when one picture is on the screen, it is seen by one eye only, the other eye having in front of it a solid portion of the disc. It will be understood that, when the disc is rotated rapidly, the images or pictures are changed so quickly that apparently the eyes are looking at a stationary picture having the usual stereoscopic relief. In the method above described one person only can view the pictures; but, if a number of discs are used, one for each spectator or group of spectators, having slots or apertures arranged to allow each eye of an observer to view the projected picture alternately, any number of persons may view the pictures at a time.

"The discs for the spectators may simply have one circle of slots or apertures suitably spaced, or they may have one or more sets of slots or apertures arranged concentrically, each set comprising two circles of slots or apertures, in which latter case two or more persons could look through one disc. These discs would be driven in correct relationship with the disc in front of the lanterns.

"It will be understood that I may employ perforated bands, vibrating or oscillating shutters, or other means of intercepting the rays from the lanterns and the vision, so long as each eye sees its corresponding picture alternately and in rapid succession.

"By means of my invention I am also able to produce moving pictures having stereoscopic relief. The two series of stereoscopic pictures are produced on two separate films, or on one film, which is afterwards divided longitudinally, and the first picture on each film is viewed by each eye respectively in succession, then the second stereoscopic pair by each eye in succession, and so on. In some cases I prefer to produce the pictures on the film with interspaces between the successive pictures, so that, as the pair of films are moved across the two objectives, a blank space will be opposite one objective, whilst a picture is being projected through the other. The movement of the pair of films across the objectives at the correct speed may be effected by any of the usual devices employed in cinematographs.

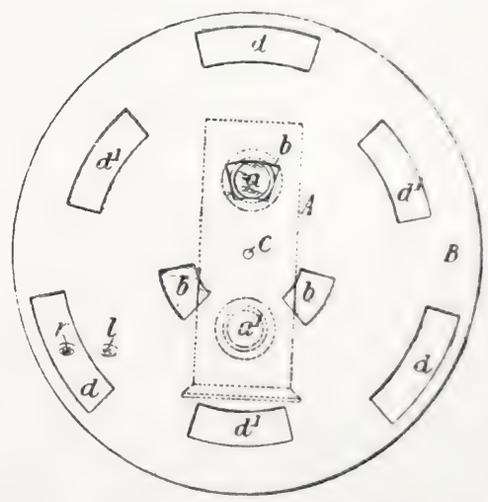
"Another method of carrying my invention into effect is to project on to the screen, alternately and in rapid succession, two entirely different pictures, which, when viewed direct or through the perforated revolving disc with both eyes, appear mixed or blended. If, however, when looking through the disc, one eye be closed, one picture will be seen distinctly by the other eye, and, upon closing this eye and opening that previously shut, the other picture will be clearly visible. The picture seen will, of course, in this case not be in stereoscopic relief.

"My invention may also be employed for viewing, in stereoscopic relief and otherwise, pictures projected in natural or other colours, as by the well-known 'three-colour process,' for example, as will be hereinafter made clear.

"Figs. 1 and 2 are diagrams illustrating a method of applying my invention to a biunial optical lantern. Fig. 3 is a diagram illustrating a method of applying my invention to two optical lanterns placed side by side, and figs. 4 and 5 are diagrams representing suitable separate discs for use by spectators.

"Referring to fig. 1, the objectives, a, a^1, of the lantern, A, are alternately covered and uncovered in rapid succession, so that only one picture is projected at a time, by means of the set of slots or apertures, b, in the disc, B, which revolves about the centre, c. Near the periphery of this disc is a second set of slots or apertures, d, d^1, arranged in two concentric circles at such a distance apart that one eye, r, of a spectator looks through one circle of apertures, d, and the other eye, l, through the other circle of apertures, d^1, said apertures, d, d^1, being further so spaced and arranged relatively to the apertures, b, as shown, that the visual rays of each eye are alternately intercepted by solid portions of the revolving disc synchronously with the alteration or change of the picture projected on the screen by the lantern, the effect being that each eye views one picture only of the two projected. To make this more clear, we will assume that r, l, respectively indicate the right and left eyes of the spectator, and that the right eye's stereoscopic slide is placed in the top lantern, and the left eye's slide in the bottom lantern. The disc, B, being in the position illustrated, the right eye will then view through the slot, d, its corresponding picture projected on the screen by the objective, a, and, as the disc, B, revolves, the visual rays of this eye will be intercepted by a solid portion of the disc, and the left eye uncovered by a slot, d^1; at the same time the top objective, a, will be covered, and the lower objective, a^1, uncovered, so that the left eye will in turn view its corresponding picture projected on the screen, and the disc, B, being revolved at a sufficient speed, the effect to the observer will be that of viewing a stationary picture in stereoscopic relief. The

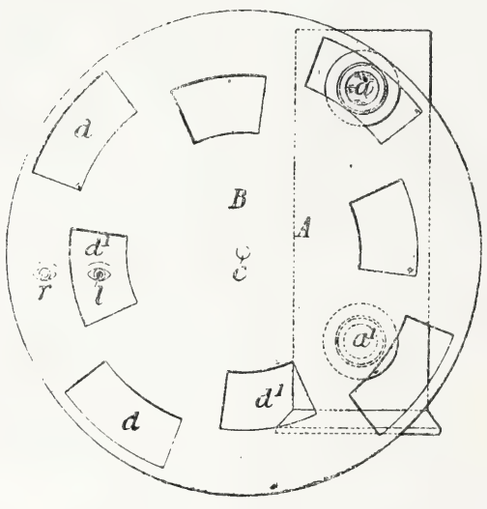
Fig 1



best position for the disc, B, in every case is that either in front of the lenses or between the combinations, wherein the whole of the pencils of light rays from each lantern come to a focus in the plane of the disc, this disposition permitting the length of the slots or apertures in the disc to be increased relatively to the opaque spaces between them, so as to avoid loss of light. The dimensions of the apertures in figs 2, 3, 4, and 5 have been calculated upon this supposition.

"The diagram (fig. 2) clearly shows how one and the same set of slots

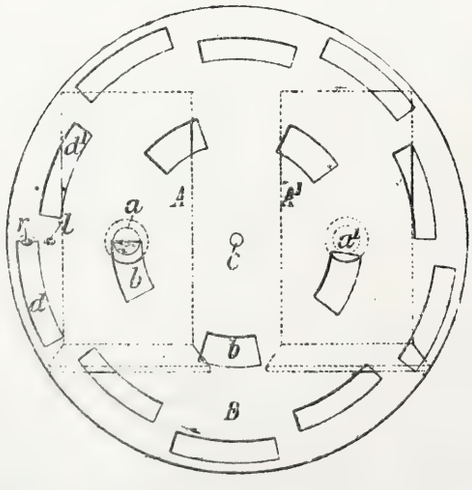
Fig. 2



or apertures, d, d^1, arranged in two concentric circles in the disc, B, may be utilised for alternately covering and uncovering the lantern objectives and the eyes of the observer.

"The diagram (fig. 3) shows a disc, B, similar to that represented in fig. 1 (*i.e.*, having separate sets of slots or apertures for the lantern objective and the observer's eyes) arranged for use with two separate lanterns, A, A^1, disposed side by side. This arrangement is especially adapted to the ordinary lanterns in which the electric arc light is used. The arrangement represented in this last-mentioned figure would necessitate the picture corresponding with the right eye being placed in

Fig. 3



the left lantern. There is no need for the lanterns being placed symmetrically with respect to the centre of the disc, as shown in fig. 3, as it is obviously easy to modify the circles of slots or apertures for many other arrangements.

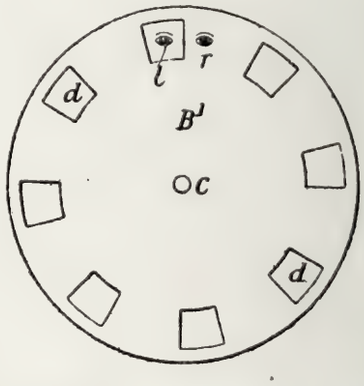
"The diagrams (figs. 4 and 5) represent suitable separate revolving discs for use by spectators.

"In fig. 4, the alternate interception of the vision of each eye is effected by one circle of slots or apertures, d, only, the screen being viewed through the top or bottom of the disc, B^1, so that each aperture, d, travels across both eyes as the disc revolves.

"Fig. 5 represents a disc adapted for simultaneous use by several observers—in this particular arrangement, four. l, r, l^1, r^1, l^2, r^2, and l^3, r^3, indicate respectively the positions of the four pairs of eyes which view the screen through the various circles of slots or apertures, d d^1, arranged, as in figs. 1, 2, and 3, to intercept the vision of each eye of a pair alternately as the disc revolves. In this figure, and also in fig. 4, the spectator is imagined to be on the near side of the disc.

"The speed of rotation of the observers' disc, B^1, must in all cases bear such relationship to that of the lantern disc, B, that the interceptions of the visual rays of either eye will be synchronous with the covering of the objective with which that eye corresponds, or, in other words, the interceptions of vision must be coincident with the change of picture on the screen; each eye will thus only view its own picture. Fixity of relation between the speeds of the lantern and spectators' discs may easily be secured in many ways; for example, by driving all the discs by suitable gearing or connexions from the same shaft, or, if independent motors be employed, by mounting the discs similarly with relation to the dividing line of a two-part commutator, and adjusting the rate of rotation by a resistance. In practice, I find it very easy to arrange that the discs shall rotate either at the same rate, or one at a simple multiple of the other's rate, for a practically indefinite period, especially if the small motors employed be similar and the discs of the

Fig. 4



same dimensions and weight. A glance through the lantern disc at any of the spectators' discs will show at once if the disc viewed is revolving at the correct speed; for, if one revolving disc be viewed through another, black bands, which I call interference bands, will appear to radiate from the centre of the disc, viewed like the spokes of a wheel, and, if the discs are not perfectly adjusted as to relative speed, these bands will appear to rotate, whilst, if the speed adjustment is perfect, they will apparently be quite stationary. The discs or other shutter devices employed may be

Fig. 5

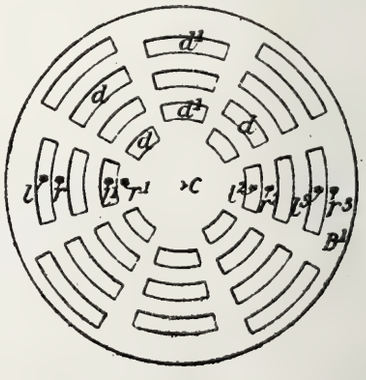
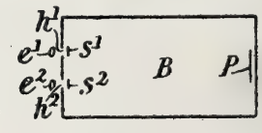


Fig. 6



enclosed within transparent casings, or may be viewed through suitable eyeholes.

"It will be noted, on referring to fig. 5, that one circle of slots or apertures is not being used by any of the observers; this circle of slots is not, however, entirely useless, as, besides reducing the weight of the disc, it might be used in the event of the transposition of the slides in the lantern, the observers in this case moving their eyes one circle of slots to the right or left, as most convenient.

"A powerful illuminant such as limelight or the electric arc light being used in the lantern, flickering of the image entirely vanishes when the discs are rotated at a very moderate speed.

"In adapting my invention for viewing in stereoscopic relief pictures

rojected in their natural or other colours by the well-known 'three-olour process,' wherein the complete picture is built up from three recisely similar superposed pictures each of a different monochrome, uch as red, yellowish-green, and bluish-violet, each stereoscopic pair ould require to be projected through two sets of three objectives, each n lieu of through two objectives, one set of objectives projecting the hree different monochromes of one slide, and the other set projecting hose of the other slide. This may obviously be readily done; for xample, imagine three precisely similar devices, such as represented in ig. 1 or in fig. 2, to be placed side by side, let the three different nonochromes of one stereoscopic side be placed in the three top lanterns respectively, and let those of the other slide be placed in the three bottom lanterns respectively; then, if the three discs, B, be revolved at precisely the same speed, first the coloured picture produced by the blending of one set of monochromes, and then that produced by the blending of the other set, will be alternately projected on the screen in rapid succession, and the observer will view a coloured picture in stereoscopic relief; or, in lieu of stereoscopic slides, two entirely different pictures, each built up from superposed monochromes may obviously be projected on the screen in colours natural or otherwise, and viewed, as hereinbefore described.

"Although I have represented perforated discs as a convenient method of carrying out my invention, I do not confine or limit myself to their use, it being obvious that perforated moving bands, or vibrating or oscillating shutter devices, might be substituted for alternately covering and uncovering the two lantern objectives and the two eyes of a spectator synchronously, for the purposes of the invention as set forth.

"In fig. 6, B is a rectangular box of convenient size, h^1 h^2, holes in the side of *b*, opposite to e^1 e^2, the position in which the spectator's eyes are to be placed. S^1, s^2, are shutters capable of covering or uncovering the holes, h^1, h^2. The picture, when being viewed, will occupy the position, P. If each of the complementary pair of stereoscopic pictures is made to take the position, P, alternately and in quick succession, it is evident that, if the eye of the observer at e^1 only sees one picture of the complementary pair of stereoscopic pictures, and the eye of the observer at e^2 sees only the other picture of the pair, the stereoscopic effect will be produced. This result can easily be obtained by arranging mechanically that when one picture is in position at P, the shutter, s^1, obscures the eye at e^1, and, when the other picture is in position, the shutter, s^2, obscures the eye at e^2. Lenses may be used in the holes, h^1, h^2.

"It is obvious that many variations may be made in applying my invention, and I do not confine myself to the particular methods described; for example, it is clear that my invention could be used with only one lantern instead of two, for the complementary slides could easily be arranged to pass alternately or in any desired manner, and at any desired time, into position in the lantern."

LANTERN NIGHTS AT THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

DURING the course of the Exhibition there will be displays by means of the optical lantern every Monday, Wednesday, and Saturday evening, as below:—

Monday, October 4, slides sent in by Mr. F. A. Bridge and Mr. A. Bridgman, *Norway*.

Wednesday, October 6, slides sent in by Mr. John Bushby, *From West to East of the Dinaric Alps*.

Saturday, October 9, to be subsequently announced.

Monday, October 11, slides sent in by Mr. T. B. Blow, *A Visit to Tunis*, and *A Week in Venice*.

Wednesday, October 13, slides sent in by Mr. J. D. Groves, *Japan and Japanese Life as depicted by themselves by Hand-coloured Slides*.

Saturday, October 16, slides sent in by Mr. E. Dockree, *Gleanings Here and There*.

Monday, October 18, slides sent in by Members of the Photographic Convention of the United Kingdom.

Wednesday, October 20, slides sent in by Mr. Eric Stuart Bruce, *The Aerial Graphoscope*.

Saturday, October 23, slides sent in by Mr. F. P. Cembrano.

Monday, October 25, slides sent in by Mrs. Main, *Mountaineering from a Woman's Point of View*.

Wednesday, October 27, slides sent in by Mr. H. Little, *Italian, Portuguese, and Spanish Scenery, &c.*

Saturday, October 30, slides sent in by Mr. H. Sandland, *Zoological Studies*.

Monday, November 1, slides sent in to the Exhibition for competition.

Wednesday, November 3, slides sent in by Mr. S. J. Beckett, *Italy, from the Alps to Etna*.

Saturday, November 6, slides sent in by Dr. Llewellyn Morgan, *From Cornwall to Canterbury—A Modern Pilgrimage*.

Monday, November 8, slides sent in by Mr. Edgar G. Lee, *North Country Life and Scenery*.

Wednesday, November 10, to be subsequently announced.

Saturday, November 13, to be subsequently announced.

FLASHLIGHT PICTURES.

[American Journal of Photography.]

THE radiations from any source of light, extending from the extreme violet to the extreme red of the spectrum, differ only in the rate and magnitude of the vibrations which are at work. The luminous, the heat, and the chemical or actinic rays, are merely modes of the same force, which is nothing more than a system of vibrations.

The difference between the light at one end of the spectrum and the other is analogous to the difference between notes of high and low pitch in music. If, for instance, we should accelerate the vibrations which at any time are manifest to us as red light, we would have the effect of violet; or, if the violet should be retarded, we would have the phenomenon of heat-giving rays predominant. In light, as in sound, there is a system of regular disturbances of a medium, which produces long and short, slow-moving and quick-moving waves.

Photography is merely a means for securing a permanent record of these disturbances. The salts of silver are so constituted that the action of the short waves, the very rapid violet undulations, is necessary to start the molecules into a shudder or tremor. The condition of equilibrium of the silver molecules is such that a response is given at once to the impact, a resistance is offered, just as the sea waves meet resistance with the shore. The direction and velocity of the waves are affected; the molecules rearrange themselves to a new condition of equilibrium; the greater number taking up and propagating the violet wave motion, while the others file off in the line of the longer waves.

So the books solve the great problem, but photography, notwithstanding, is still to us *mysterium magnum*.

But we do know that the sun is not the only source of radiation which produces chemical effect. Any substance, which, when subjected to the action of intense heat, resists all tendency to conversion into vapour or gas, still remaining in a solid condition, gives, when the radiations from it are passed through a prism, a continuous spectrum similar to the sun's spectrum.

This is something to know. There are several bodies which resist the vapour-converting action of the highest degree of heat, and give, like the sun, uninterrupted spectra.

The carbon points of the electric light are yield a pure white light, which presents a continuous spectrum from red to violet; so do incandescent magnesia, lime, and other bodies.

We are thus empowered to create for ourselves, so to say, miniature suns, pocket editions, which can do our photographic work

> "When the sun in bed,
> Curtained with cloudy red,
> Pillows his chin upon an orient wave."

But the various groups of colour in these spectra are not always distributed in exactly the same proportions as in the sun's spectrum. In some the yellow and red will predominate; in others, the blue. Now, as the salts of silver are influenced chiefly by the blue rays, it follows that any incandescent solid, rich in such rays, is especially valuable in photography, although its heat-giving and light-giving rays may be less extended than in the sun's spectrum.

Magnesium, when supplied with oxygen, is converted into magnesium oxide, or magnesia, which, if practically infusible at any temperature, we can reach.

It therefore gives a continuous spectrum, and, although its light-giving qualities are inferior to the luminosity of electric light, it is far richer in actinic rays—we use the word with caution. The light from burning magnesium, or rather incandescent magnesia, is not so intense as sunlight or electric light—a great advantage in securing soft, harmonious photographs. Bunsen and Roscoe estimated the light of the sun, as compared with incandescent magnesia, to be 500 times as great, while the sun's actinic intensity is only thirty-six times as great.

To secure full photographic value of the magnesium flashlight, certain conditions are necessary. Metallic magnesium, in foil or ribbon, readily takes fire and burns at the expense of the oxygen in ordinary air, but the combustion is much slower, and the magnesium oxide is less incandescent than when the metal is finely powdered and projected into a flame. When burned in oxygen, the incandescence is greatly augmented. Now, any body which supplies an abundant stock of oxygen to the metal in a prompt delivery causes a large quantity to be ignited in a short time, thereby increasing the amount of energy, and, consequently, the incandescence. It is necessary, therefore, that the energy should not be dissipated, but concentrated so the flash may be of the shortest possible duration.

The flash cannot, strictly speaking, be instantaneous where pure magnesium powder alone is employed; there is danger of the registering of motion; but, with blitz-pulver, exposures may be made in one-fiftieth of a second.

The writer prefers blitz-pulver, not only on account of its superiority to all other flashlight compounds, but also from a sort of parental attachment to it, having first prepared it ten years ago, and demonstrated its photographic value before the Photographic Society of Philadelphia. The addition of powdered metallic aluminium to magnesium flash com-

pounds is of doubtful utility. Only a small percentage can be employed, a slight excess causing a sputtering of partially ignited metal, which is liable to occasion comets across the path of exposure.

The unscreened light is generally employed, and the point of ignition of the powder should be rather high, so that the shadows may be cast low; an effect not unlike skylight illumination is thus secured.

A shadow of a head against the background is not always desirable, but sometimes very artistic effects may be had by its introduction.

There is a beautiful picture by Rembrandt, a night scene, an interior, in which a woman is reading by a light placed low on the floor and hid from the spectator by her body. She is reading to an older woman, who has a spinning-wheel by her side, and a cradle at her feet in which an infant is sleeping.

The description of all this sounds very ordinary, but the picture is one of the most impressive that Rembrandt ever painted. The window shutters are closed, the world is shut out, and we know that the book with which both are engaged relates to a higher world—a thought with which the image of the sleeping babe is in unison. The effect of the picture is highly tranquillising, and akin to that produced by Cowper's exquisite description of evening, beginning with "Let fall the curtain."

We have mentioned this picture to show how a great artist is not afraid of vigorous shadows.

But Rembrandt never gives us a head stuck close against a wall. He is too fond of depth and space.

Certain styles of lighting become popular from some cause or other, and every operator at once conforms to the prevailing taste; applies the selfsame method to every character of face, despite the sarcastic remarks of the artist, who relentlessly dubs it "the photographic light."

With flashlight any variety of illumination may be had, simply by proper shifting of the light or lights.

Magnesium light is not so intense as the electric arc, is more diffusive, and gives softer shadows, without harsh contrasts.

One cannot tell from an inspection of a successful flashlight picture—that is, from the gradations of lights and shades—whether it has been illuminated by daylight or magnesium.

Direct shadows, however, so effective in a work of art, which daylight workers seem to shun, may be made to contribute much to the beauty of the picture, giving relief, pleasing contrast, and a degree of naturalness that is delightful.

With the direct light the artist is able to satisfy his longing for those beautiful touches of high lights along the nose, upon the cheeks, and on the forehead, which never appear in skylight portraiture. Flashlight portraits scarcely need any retouching. The portraits which accompany this paper are without any actual retouching.

Another peculiarity of the flashlight portrait is the beautiful expression of the eyes. They have a brilliancy unequalled by any other illumination. But here let us caution against shutting off the lights in the room during exposure.

Let the lights burn, and keep the lens capped, if you have drawn the slide, until you are ready to press the bulb which ignites the powder. We will tell you why it is better to make the picture with the gas lit.

A certain amount of expansion of the pupils gives, as is well known, a beauty and brilliancy to the eyes (naughty ones use belladonna). In a strong light the pupils are very much contracted, and the expression is not so beautiful as when the eyes are seen in "a dim religious light." In total darkness the pupils are very much dilated, and probably have an unnatural look—a look which is called owlish.

As the duration of the flash is in fractions of a second, much beyond one-sixth, the denomination necessary for the nervous response of the pupil, the pupil remains at that degree of expansion with which the light of the room has affected it; in absolute darkness, widely expanded in the subdued light, dilated only sufficiently to give beauty of expression.

While on the subject of securing good expression, we would say the only rational way of making an exposure with the instantaneous flash is to employ a simple contrivance for automatically igniting the powder, so that the sitter is left in blissful ignorance of the time when you are ready.

When a taper or match is used to set off the charge, you not only run the risk of burning your fingers, but of spoiling the pose and expression of your sitter. Watch for the favourable moment, and then gently press the rubber bulb.

Reflectors are seldom necessary. If employed, let them be placed at some distance, so as not to obliterate the detail of the shadowed side. Never use silvered reflectors; but place a reflector back of the flash lamp, so as to prevent dissipation of the rays where they are not needed.

If the right angle of illumination is chosen, the reflection from the walls will generally be sufficient to light up the shadows. Probably flashlight is used most of all in photographing interiors. It not only does the work more effectively than daylight illumination, but saves a great deal of time and escapes halation. The development of flashlight photographs is hardly materially different from that employed for ordinary negative work.

We prefer a rather diluted developer, in which the alkali is in slight excess, strengthening with pyro if necessary. The amount of alkali should not be such as to flatten the negative. There ought to be a certain area of brilliant high light, a certain area of deep shadow, with rich intermediate gradations.

JOHN BARTLETT.

A CAMERA LUCIDA FOR USE WITH BOTH EYES.*

WHEN using the camera lucidas which are on the market, of course preference is given to that known as Abbé's, and invented by Wollaston. Abbé's is not altogether satisfactory, and Nachet's is better. But I have an instrument which can be used with both eyes at the same time, which seems to be a novelty. And this one, besides using both eyes, was home-made, so that its manufacture is extremely cheap. Besides, it has the novelty of being made by myself, and can readily be so made by any one.

A brass cap is made to fit loosely over the eyepiece of the microscope, so that it can be moved around and the camera pointed to any point of the compass. This is important, as will be shown further on. Upon this is placed a prism of 30°. This can be obtained at any ordinary optician's. The prism is of ordinary crown glass, and is rather large as purchased, but out of it two or four prisms can be cut. I find it can be cut with a red-hot poker placed upon it along the line which it is desired to cut. The cut surfaces can then be ground down with an ordinary hone with emery and water. This takes some time, but is not essential. The microscope is placed in a slanting position, which is advantageous, for the camera lucida can be placed upon the instrument without having to turn it over until it points transversely.

The object is viewed in the ordinary manner. Now, when viewed through the camera lucida, the object seems to be moved towards the smallest side of the prism; that is to say, the ray does not go through the instrument in a straight line, but is bent towards the thin edge of the prism, and in this way it seems to move the object out of the microscope to one side. When the left eye is used on the microscope, the thick side of the prism is on the same side—*i.e.*, the left. The object seems to be moved towards the right. It is there thrown down on a paper which is used to delineate it by means of a pencil. This pencil is seen by the right eye, and, in consequence of the two eyes being in use the object seen by left eye is transparent to the paper and seems to be where the pencil is. Of course, such a camera lucida is not perfect; but it comes into play very often, and this was the shape I made it into.

I propose to use a plano-convex lens, with the convex side uppermost where the right eye is placed, and this will make it more certain; for, if the lens is 12 or 15 inches focus, it can be used to see the pencil point, and also to fix the eye, which has a liability to wander. I find in my case I can move one eye without the other, and this makes the image which is formed by the right eye move. Of course, when the left eye is used to see the pencil point, the prism can be reversed, and sometimes it is useful to move it around from the east to the south-east; but these movements can be variable, as can be seen. I wish this camera could be tried, for it is easy to make and easy to use.

* By Arthur M. Edwards, M.D., Newark, N.J., in the *American Monthly Microscopical Journal*.

Correspondence.

THE COUNTY COUNCIL AND ACETYLENE APPARATUS.

To the EDITORS.

GENTLEMEN,—In your issue of the 3rd instant, we notice in your "Lantern Mems" that you think "it would be satisfactory to the public, and a lucky thing for the designers and manufacturers of acetylene apparatus, if the County Council, or Board of Trade, or other responsible authority, would "pass" as satisfactory, a generator, &c., We beg to inform you that we have submitted our generators, of both patterns, to the Chief Officer of the Public Control Department, Whitehall, for examination and testing purposes.

After keeping them for some weeks, and being given to understand the L. C. C. were satisfied as to their safety, we asked if they would give us a "certificate or pass" to that effect, but the official informed us that the L. C. C. made it a strict rule never to grant anything of the sort either for acetylene generators, paraffin lamps, or anything else. Now that there are practically no restrictions on the use of this beautiful light for the lantern, surely the great number of generators that are in use is the best proof of the safety of acetylene.—We are, yours, &c.,

THORN & HODDLE, *Makers of the Incanto Generator.*

164, *Camberwell New-road, London, S.E., September* 17, 1897.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*November* 5, 1897

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

THE following remarkable paragraph appears in a contemporary: A Washington professor, who possibly has been reading *The Diamond Lens*, written by a countryman of his, asserts that he has worked out a process by which objects can be magnified to a size 300 times greater than by any of the microscopes now in use. The professor declares that he has succeeded where all other scientists have failed—in discovering a way by which the image projected on a lens can be again magnified by a second lens as if it were the original object. To do this has been the aim of scientific photographers and microscopists for many years. Professor Gates does not take the public into his confidence sufficiently to divulge the details of his invention, but he says he will be ready to give it to the world in a few weeks. The power of the new instrument is mentioned as 3,000,000 diameters.

* * * * *

MR. BARNARD, of the Yerkes Observatory, has tested the big telescope on the moon, and is reported to have said that "one can see an enormous number of small details never seen before, such as small craters and minute crevasses, but there are no traces of water, air, or life, in any form to be detected. It is possible that the lines found on photographs taken at Meudon Observatory, in France, might be crevasses. I don't pretend to say what they represent. I only know that the observations taken here fail to give any confirmation of the theories of the Parisian astronomers."

* * * * *

THE cinematograph made its appearance at Balmoral on Monday night, October 25, when Her Majesty and the Court witnessed a highly successful entertainment, given by Mr. William Walker, of Aberdeen. The pictures shown were of a very diversified kind, beginning with the Jubilee, and including such humorous items as clowns, a pantomime sketch, snowballing, and a bicycle spill. Fortuitously, the director of the entertainment was able to show some pictures of the heroes of the hour—the Gordon Highlanders—which specially gratified Her Majesty.

* * * * *

IN the *Journal de Physique* for October, M. Henry Becquerel's explanation of the experiments of M. Le Bon on the so-called black light (*lumière noire*) is given. M. Becquerel finds that all the observed phenomena can be attributed to the action of ordinary red and infra-red rays. Not only is ebonite transparent to such rays, but they possess the property of extinguishing the phosphorescence of sulphide of zinc, and of acting on a slightly "fogged" photographic film in exactly the manner observed by Le Bon. Moreover, when the ebonite is replaced by a sheet of red glass, the same phenomena are observed.

LANTERN MEMS.

LITTLE did I think when writing recently in "Mems" about the number of slides required to be shown by some lecturers in a given time, that I should be called upon to officiate at a lantern entertainment when the number of slides to be got through in an hour totalled 130 or thereabouts. I had provided apparatus and carriers for an average number of slides, and, as it was a bi-unial lantern, with registering carriers, and a rackwork curtain shutter, and gas dissolver, a reasonable time was necessary to change the slide, dissolve, or rack up the curtain, and, notwithstanding this was done at express speed, generating a temperature in the operator of something like that of a Turkish bath, it was difficult to keep pace with "Next, please!"

* * * * *

I THINK lecturers should indicate to the operator, some time before the lecture, the probable number of slides to be shown in a given time, so that an apparatus and carrier might be used suitable for the purpose, and the necessary assistance obtained for the slides to be taken out as shown, or an automatic changer used. In most cases, however, I think the lecturer would be wise to cut some of his illustrations, for sixty or seventy are quite enough to show in an hour. In the case I allude to, the illustrations were all more or less of the same class, and the audience were in a large proportion wearied, notwithstanding the excellent information given. The composition of the audience was unique, and I believe I am the first person that has operated under similar circumstances in London, which was such that I could not have an assistant with me after the apparatus was set up.

* * * * *

GIVEN a plain push through or panoramic carrier, a great number of slides can be got through quickly, as instanced where there are two or three at the apparatus—one to insert the slides, another to withdraw them, and often a third to attend to the light. This is not an altogether unfamiliar scene at some of the photographic lantern nights, where an extra number of slides have been contributed for exhibition. I heard once of a lecturer handing up 300 slides to be shown in the regulation time for the lecture (one hour), but, of course, in this case it had to be exceeded somewhat.

* * * * *

THOSE who saw Mr. Muybridge when he first came to England to exhibit his "zoopraxiscope" will remember the rapidity with which he changed his subjects; but, if my memory serves me rightly, he had three operators to do it—two to look after the slides, and one to

uncap and cap the lenses. Capping, in the instance I saw, was literally so, for a soft tweed cap was used, the time necessary for opening and shutting a cap or shutter being more than could be spared, if the lecturer was to be followed with "Now you see the right forefoot down," "Now the left," and so on, describing the movements of the animal. To sum up, I cannot emphasise too strongly not *overdoing* the illustrations in a lecture where the subjects are more or less of the same kind. It is not a bad thing to bear in mind, in lantern matters as well as every-day life, that "variety is charming."

* * * * *

THE word "charming" brings to my mind Mr. Ives's projections of colour photography, and so clever is his apparatus, and good the resultant picture, that everybody who has recently had the pleasure of seeing some of his work at the evening Exhibitions of the Royal Photographic Society have, I think, been charmed, and gone away with something on their mind that should leave an impression. Personally, I was pleased with the mechanical addition he has made to his apparatus since last I saw it, for now, by a simple lever, he can make the three-colour pictures coalesce or separate at will, and so show separately the red, green, and blue-violet pictures or one picture, when all are superposed and in register, that give pure natural colours. I shall be glad when he is ready to place this apparatus on the market for sale.

* * * * *

THE photographic apparatus for taking these kromgrams will probably want more careful manipulation than an ordinary camera; but I think, now the Photo-chromoscope Syndicate have established their reputation, and shown what can be done in the hands of their own skilled operators, they will find many amateur photographers of average skill who will emulate their example, and be able to produce lantern and stereoscopic subjects that will give pleasure to themselves and friends, and, after a time, compare favourably with what are being turned out commercially for that beautiful stereoscopic apparatus, the "kromskop."

* * * * *

I COULD not help thinking, when listening to Mr. Eric Bruce's interesting lecture on the ariel graphoscope, how powerful is individuality in invention. Here is the simplest possible discovery that, under ordinary conditions of common-sense life, would be termed a toy, and yet so enthusiastic is the discoverer of it that he not only exploits it for all it is worth, but infuses into the subject some scientific quality that almost makes it "walk alone." As to the illusion and spirit phenomena attached to it, I am afraid some of us matter-of-fact people in the optical world are only half-hearted, and I must say, if an illusion is to be illusive, you must not be able to see "how it is done." In cases of sleight of hand in conjuring, the audience must be deceived, and—I say it in all friendliness—I think, in the case of the ariel graphoscope, a considerable amount of stage managing will have to be resorted to before the "ariel" dagger can get rid of his companion, or secondary projection, on the velvet and background behind, and so realise a perfect illusion.

G. R. BAKER.

THE PICTORIAL SLIDE.

ITS DECLINE AND REVIVAL.

FEW things in connexion with photography are more remarkable than is the steady slump in slides which has now been in progress for some years. This last year reached what Sir Boyle Roche might have termed "such a height of depression" that one, at least, of the photographic weeklies summarily decreed the complete extinction of lantern slides which claimed to be considered artistic productions.

Yet time does not seem so very long since a good many industrious and oftentimes clever amateurs were wont to make our winter evenings tolerable, and, moreover, lent a pleasant flavour to the dreariness of local exhibitions, by means of sets of lantern slides which largely based their main attractions upon being compositions whose *raison-d'être* was purely pictorial and whose earnest aim was to claim distinction as being related to pictorial art.

They sought not to interest by their informative character, neither by their startling records of sensational facts, nor by their mere technical triumphs, but borrowing of art her golden mantle richly broidered with natural beauty, invited admiration for their acquired charms of compos tion, suggestion, and general æsthetic accomplishment. If we did n always—or ever—get Claude, or Corot, nor even Vicat Cole, this is r more than can still to this day be said of the prints of even the mo precious and precocious.

No doubt, the gum-bichromate, the carbon, and the platinotype printi process, in the hands of our very best workers, delight a good many, an if not exactly joys for ever, are at least not infrequently stepping ston by which the beholder is able to reach higher things.

TOURIST TWADDLE ON THE SCREEN.

At any rate, as regards lantern slides, there was in former years litt or no room for the apparently interminable series of tourist twaddle wit which we are in our days nauseated. Who has not sat an unwillin victim for perhaps two mortal hours whilst Mr. Purblind Prosy has wit irritating iteration enlarged upon the inanities—from Parsonage t Pump—which cluster round the village of Mediocre-super-Sad?

To account for the blight which has almost exterminated the bett class of lantern slide is not to be accomplished in a sentence, but nor the less is it possible to point out some of the causes and to sugge remedies. Chief in influence and first in time amongst the vario agencies which have tended to the decline of the slide cult is the di favour of a circle of distinguished amateurs, some of whom in bygo years shone brightly enough by means of their lantern transparencie whilst the rest hardly ever make a negative which is capable of pr ducing an even passable picture on the screen.

These have of late been teaching that, in comparison to gallery picture lantern slides are trivial, unworthy, and moreover, are incompatible wit the making of pictures, as opposed to statements of detail topographi anthropometric, or otherwise statistical, of form, and outline. It is t old fable of the fox without a tail. The production of ill-defined, bad illuminated, heavy-toned paper prints is quite at variance with t methods needful for obtaining passable lantern slides. Hence, in gre part, why those who devote their photographic energy to the concoctio of sensational and erratic gallery pictures have so stoutly denounce lantern-slide making as *infra dig.*, and impossible for those possessing t true artistic temperament.

Unfortunately, for slide-making, there are not a few of the best of o amateurs who dread the "deep damnation" of the aforesaid "pi torialists" more than they welcome the depreciated medal, or even valu the applause of hundreds of deeply gratified beholders, which is elicit when an unusually telling and poetic tone picture is flashed upon t screen.

A COLD DOUCHE FOR SLIDE-MAKERS.

Amongst the kind of cold water thrown upon the slide-makers, son teachers there are who roundly proclaim that a slide can never approac a paper print because, forsooth, the former "can possess no goo qualities beyond those due to good selection of subject and technic excellence." These are the printed words of Mr. Horsley Hinton, wh furthermore, dwells upon what he terms "the practically insurmountab obstacles which stand in the way of producing the desired effect on lantern slide which "prints in so short a space of time that it wou need dexterity for surpassing that of the most accomplished jugglers "dodge," control, shade, and expose various parts of the plate.'

Such sweeping condemnations are, no doubt, answerable for t manifest disinclination on the part of the rising generation of amateu to take up with slide-making.

Of course, all those who are fairly familiar with the technique of t subject know full well that a transparency is probably far more amenab to controlling modifications than are most categories of prints.

Thus the general scale of density is capable of almost infinite variatio by means of exposure and development. Then the combination of tw or more negatives, as for instance, sky, figure, and landscape, from thr different negatives, is more facile of accomplishment than where a pap print is in case.

Local retardation, or, on the other hand, acceleration during develo ment, local reduction after development, general reduction and i tensification, variation in colour of image—all these, and more, are at an rate as easy with a slide as with a paper print.

Whilst making passing allusion to the modifying powers available the maker of pictorial slides, let me not fail in directing attention the great degree of control possible by means of the system ofte practised of over-development followed by partial and also gener reduction with hypo and potassium ferricyanide. The practice i question is, of course, by no means a new one, but it has recentl received the *cachet* of Mr. Steiglitz, who recently delivered a suggestiv and informative paper upon the subject before the New York Came Club, which the slide-making fraternity would do well to read.

WHERE THE LANTERN-SLIDE SCORES.

There is one, and a very important respect, in which the pictorial slid stands at great advantage when compared with the gallery photograph that is, it insists upon being seen, and, when seen, obtains the beholder undivided attention. Everything is most favourable for the making of deep impression, nothing to induce mind-wandering, no possibility o accidentally overlooking the slide, which often happens with ver

torious pictures that are not seldom passed by quite unnoticed. Seated he dark, with nothing but the masterpiece to attract the eye, the e is much more likely to be completely gratified than where his ce is free to swiftly flit from one to another of forty prints which pete for attention.

gain, it is incontrovertible that the projected image of a slide is able oast of a much longer scale of light and shade than is the case with a it seen merely by reflected light.

his, added to the advantage in size, which permits the duly emphatic lay of comparatively small objects so that the eye can quickly see the mind properly appreciate them, gives the slide a great ponderance of superiority over the smaller-sized, dimly illuminated er print.

'or instance, take the familiar case of a setting sun. This, when otographed with a nine-inch lens on to a half-plate, will appear quite iculously small, both relatively and actually. Painters in such a case s in all other similar ones where objects small in size but large in erest are introduced—get over the difficulty by painting the sun about ce or even thrice its actual diameter compared with other included ects. By this expedient the artist is able to express upon his canvas impression of size made upon him due partially to the phenomenon own as irradiation, but mainly to a subjective exaggeration of the nd. If we could make a print approaching life size, and of equal ensity of light as in nature, the mind might be as much impressed by as regards the apparent dimensions of various objects as if the pression came direct from the original scene instead of from the nterfeit presentment. But, the smaller the print, and darker, the less rfect will be the illusion which nature treats us to. Hence, when, as lantern-slide pictures, we accentuate the ordinary pictorial scale of ht and shade, and very greatly enlarge the diameter of the objects, we *o tanto* overcome the native inadequacy of rendering which all other ctures are liable to.

The imagination being excited by a big and brilliant image in a large gree does that which it is accustomed to do, *i.e.*, unconsciously agnifies the impression of the salient parts of the scene.

A Bar to Progress, and its Removal.

One obstacle, however, which slide-makers have to surmount, and hich, in a great measure, bars the way to the continued and assured rogress of the cult as applied to the best class of pictorial photography, of a very substantial character.

It is that there is at present no universally recognised standard of size, olour, and illumination of the projected image. Nor is there any fixed istance adopted for the viewing of slides. These are very real and even erious difficulties, as all experienced slide-makers will allow, and I am isposed to think that it is for want of regulations upon these points that he former leading exhibitors of the pictorial slide were persuaded to throw up the sponge.

Take the matter of illumination. It is perfectly well known to all who re even slightly familiar with lantern work that a slide which gives a ost delightful effect when projected by means of an oil lamp will prove ecidedly unsatisfactory if shown the same size by means of, say, a mixed et, the superior intensity of the latter light tearing to pieces those elicate half-tones which are, however, well able to preserve their values hen the light of a paraffin lamp is employed.

As of intensity, so of size, as regards the picture. The diameter of the isc very greatly qualifies the appearance of the image. Thus a picture nlarged to eight feet square will manifestly be about twice as brilliant as f magnified to eleven feet square, and three times as brilliant as if shown ourteen feet square.

The size of the screen has a further importance, in that, the greater the mplification of a slide, the finer should be its detail and the more erfect its gradations. On the other hand, aerial perspective, and all ffects which lend relief and distance to the components of a scene, are onsiderably prejudiced by an over-sharp rendering, as would happen here a slide that is suited for a thirty-feet disc is shown upon a six-eet one.

Best Distance from which to View a Slide.

That there is a theoretically correct distance from which the projected mage should be looked at needs no argument, nor that, outside this oint, there exists a considerable radius within which a practically perfect iew may be had.

Supposing that the original negative (measuring three inches square) as taken with a six-inch lens, the theoretically best position for viewing he picture enlarged to fifteen feet would be to place the eye upon a line oincident with the optical axis of the lens when the negative was taken, t a distance of thirty feet from the screen. Should a four-inch lens ave been used to obtain the negative, then the distance would be twenty eet; on the other hand, a nine-inch lens would require the standpoint to e forty-five feet from the lens.

In the foregoing calculations the underlying principle is that the mathematically correct position to view a positive is from a point which oincides in distance and position as regards the centre of the print with hat occupied by the lens when the negative was taken; if the picture be subsequently enlarged, the distance from the plane of the picture to the point from which the picture is to be viewed is proportionately increased.

Of course, where a lantern slide is viewed as usually shown, *i.e.*, upon an opaque screen, it is manifestly impossible for any one to place his eye in the relative position to that occupied by the lens when the negative was taken; for, in order to do this, the beholder's head would of necessity intercept the light proceeding from the lantern objective to the screen. However, for all practical purposes, it may be presumed that a point anywhere opposite a perpendicular line which bisects the disc, and at a distance from the screen, as above explained, is sufficiently near to absolute accuracy.

Without labouring to prove that from no other position than the foregoing should a lantern slide be judged, it will suffice for the immediate purpose in view to enunciate that, where any one seeks to receive æsthetic pleasure from a projected lantern slide, there is a particular distance at which he is likely to obtain the largest meed of satisfaction, from which it follows that, wherever a competition for slides is held, the man who knows at what distance his slides are to be viewed may, by using a lens of suitable focus and aperture when taking his negatives, best succeed in giving satisfaction.

Regulating the Exhibition of Slides.

In order to place the future of lantern-slide making upon such a stable and hopeful footing as will induce a larger number of careful and gifted workers to bestow sustained attention upon the making of the highest type of pictorial slides, a series of regulations dealing with the following points are, to begin with, needful.

(1) A fixed standard of illumination of the disc, which should conform to an approved measure of (*a*) intensity and (*b*) colour.

(2) A fixed size of disc, with a defined minimum of area to be covered by the projected image.

(3) A fixed relation between the size of disc and the point of view from which the image on the screen should be seen.

As regards (1), simple photometric instruments are available, whereby the intensity of the light reflected from the screen may be accurately measured; in respect of the colour of the light (a by no means unimportant detail), there should be no difficulty in applying one out of several convenient tests.

Respecting (2) nothing need here be said, except that a liberal range of area should be permitted, say down to one-third the total superficial dimensions of the largest possible sized rectangle which the disc will contain.

As for (3), the point of view, it need not be too narrowly circumscribed. The distance might advisedly be defined as from one and a half to two and a half diameters of the disc. This is merely given as an approximation of what is likely to be generally acceptable.

There is no room to doubt but that some such rules would be exceedingly popular with all who are inclined to enter slides at an exhibition, or to otherwise lend them for public display on the screen. The chief initial difficulty is to find an authoritative body which is able and willing to draw up and to promulgate the necessary laws.

There is still, I believe, in existence a Lantern Society,* which, if really representative of the bulk of our slide-makers, would, of a surety, be the proper body to take this matter in hand. Should, however, the foregoing lack either status or energy, the subject is one which might well receive attention from the Affiliation Committee of the R. P. S.

As already pointed out, there is little which would be likely to trouble those who have the final drafting of the conditions under which exhibitions and borrowed slides should be shown. No intricate or vexatious regulations need be adopted as to sources of light, systems of condensing or of projecting, nor need anything be said about the screen, the chief crux being to define or suggest a simple, cheap, standard instrument, which shall measure both the intensity and the colour of the light which a given screen reflects.

There are, I am fully aware, other points than those touched upon connected with the adequate projection of slides which require regulating; but, in comparison with those referred to, they are not very important, and can therefore afford to wait until the more pressing defects have been reformed.

Finally, let me reiterate the crying need that something should at once be done to revive interest in the pictorial slide. If evidence beyond common experience is required, consider the slides exhibited at the Royal Photographic Society's Exhibition. Of the highest type of pictorial slide there are practically none; if an exception is made in favour of Mr. Alfred Stieglitz, it is impossible to forget that his slides are what may be termed after-thoughts, and are so much the less satisfactory and perfect. To particularise were tedious—enough that the highest expression of which a slide is possible cannot be attained unless from the very beginning the photographer has aimed at the particular end in view. Manifestly many, if not most, of Mr. Stieglitz's subjects have been designedly taken with the object of obtaining gallery prints, and have subsequently been adapted to lantern slides.

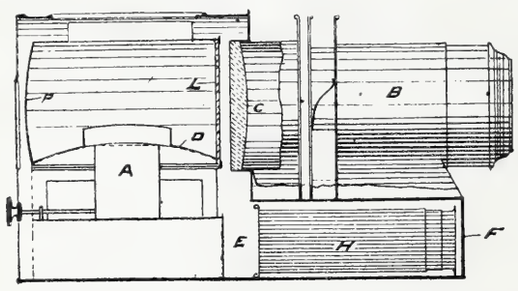
Hector Maclean.

* The Lantern Society is dead.—Eds.

OLDFIELD'S IMPROVEMENTS IN MAGIC LANTERNS AND IN LAMPS THEREFOR.

MESSRS. OLDFIELD'S invention has for its object "improvements in magic lanterns and in lamps for same," and refers more particularly to the latter, in which they control and distribute the draught in such a manner that increased light is obtained, and the generation of heat is so governed to obviate fracture in the front glass plate and to protect the reflector, as the flame is so controlled and directed as to direct the points of the flames away from the front glass plate and reflector; thus the glass plate and

FIG. 1.



reflector are not subjected to the effect produced by generation of heat present in lamps constructed after the usual manner. The invention also refers to the packing of the chimney for the purpose of carriage and transport, which they effect in a very cheap, simple, and economical manner.

Fig. 1 is a part section and part elevation through a lantern and lamp.
Fig. 2 is a view of the burner with deflecting plate removed.

FIG. 2.

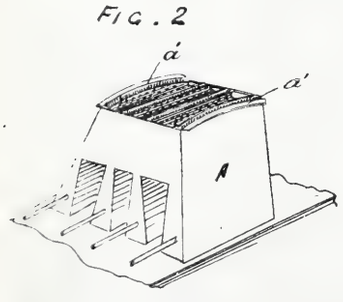


FIG. 3.

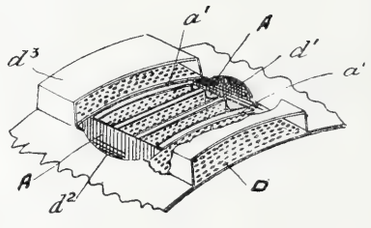


Fig. 3 is a similar view to fig. 2, but taken with deflector in position.
Fig. 4 is an elevation of a telescopic tube.
Fig. 5 is a section on the line 1—2.

It will be readily seen on reference to the drawings that A is the lamp burner, B the lantern, *c* the condenser, and in carrying the invention into effect the quadruple burner, A, is provided with the wings, a^1, formed one on each side of the burner, which, together with the top of the wick sockets, are curved as shown to fit the curve of the deflector, D, so that, by an even distribution of draught passing up and converging on to the broad side of the flame, increased brilliancy and a steadier light is obtained. The deflector is composed of the perforated plate, D, with solid plate, d^3, and an aperture which they hollow out at each end, as shown at d^1 and d^2.

The draught being thus converged on to the edges of the flame in such a manner that the points are withdrawn from the glass plate, L, at the

FIG. 4.

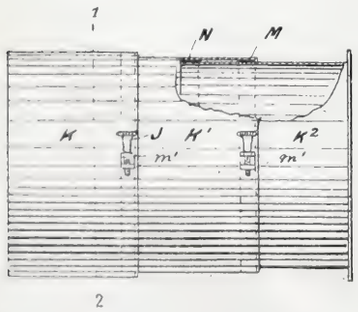
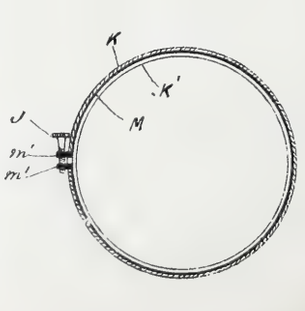


FIG. 5.



front and reflector at the back of lamp, by the greater area of ventilation between the glass and frame the fracture of the former from heat is entirely obviated, and the effect produced on the reflector, P, by heat is done away with, as it is not subjected to the generation of heat present in lamps constructed after the usual manner; thereby increased illuminating power is obtained by the reflector always keeping bright, and dispensing with the use of glass or transparent substance between the flame and reflector as a protection for the latter, and thus increased brilliancy is obtained by direct reflecting power. In the other part of the invention they provide an opening into the base of the lantern at E, and thoroughly seal the front, F, thereby giving the lantern body greater rigidity for the purpose of preventing the passage of any light, also giving the lantern body greater rigidity, and by which means they are enabled to insert the telescoped chimney, H, through the opening, E, into the interior of the front foot of the lantern as shown. In the case of the telescopic tube, K, K^1, and K^2, as shown by figs. 4 and 5, they provide the spring band, M, which fits around the inside of each of the outer sections at the front, and which is provided with the lugs, m^1, and thumbscrew, J, by which means, when the tubes are extended, the screwing up of the thumbscrew, J, tightens the spring band and clamps the inner tube, thus assisting to bring the tubes to a straight line and true centre and retain them in that position. The inner tubes in each case are provided with a metal band, N, which thickens out the rear end of such tubes so as to be equal to the thickness of the spring band, M.

ECONOMY IN COVER GLASSES.

MR. ROBERT HUMPHREY, in *The Photo-American*, remarks that some of those who are interested in photography can walk into a store and call for what they want in a lordly way without feeling any concern about the size of the bill. Others can follow the art as an inspiring avocation only by looking after the economies. In no department can there be more extravagance and waste than in making lantern slides. One man will buy an expensive copying camera, another will attach a frame to his ordinary camera and enlarge and reduce by throwing a cloth over the space between the lens and the negative to be copied. The one will throw away all plates that do not come out just right at first; the other, by judicious reduction and intensification, will save a large proportion of them. The one will buy expensive mats, ready cut out, whether they are the best size or shape for his slides or not; the other, by means of his shears, or jig saw, will cut mats from needle paper just the size and shape he wants at one-tenth the expense. The one will buy cover glasses at three cents a piece, or thereabouts; the other will use the negatives that were spoiled, or that he does not care to keep, and thus prevent a raid upon his pocket-book.

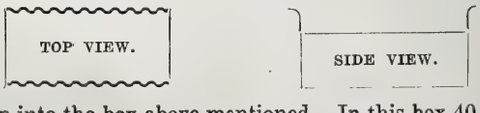
How to use old negatives for cover glasses is, therefore, the idea. The first thing is to get them the right size. I have seen, continues Mr. Humphrey, many complaints in the papers about the difficulty of cutting a number of glasses the right shape and the same size, whereas nothing is easier if you have suitable apparatus. All you need is a cutter and a few pieces of wood. The cutter I use is known as the wheel cutter, and can be bought for fifteen cents. It will last for a long time if you draw it over the glass to be cut with a firm, even pressure and—but once. If you attempt to cut your first mark deeper, you will fail and will need a new cutter.

As to the board, mine is a piece of $\frac{1}{2}$ in. oak, 12 in. long and 9 in. wide, with a $1\frac{1}{2}$ strip the same thickness, screwed on one side and extending the entire length.

I have also two pieces of wood $\frac{3}{8}$ in. thick, one of which is $3\frac{1}{16}$ in. wide and the other 4 in. lacking $\frac{1}{16}$. These dimensions, *plus* the space taken by the cutter, will give a glass the standard American size—$3\frac{1}{4} \times 4$ in.

To cut the negatives, place them film downward on the board with the edge in close contact with the strip. Then one of the pieces of wood above mentioned, is laid on it, also in close contact with the strip. Now draw the cutter down the glass on the outer edge of the strip of wood and your glass is cut standard size. Repeat the operation till all your glass is cut one size. Then use the other strip of wood and cut the other dimension. In this way cover classes can, with a little care, be cut with enough uniformity to satisfy any one not using a micrometer gauge. As to cleaning them, the photographic journals are full of cumbrous—I had almost said bungling—methods of doing this, and all sorts of alkalies, &c. are recommended. But the chemical I use is our old friend H_2O, raised to a boiling point, with a little sal soda or washing powder added to soften the gelatine more quickly. If you have only a few glasses to clean, get an ordinary shallow iron pan, lay your plates in, film upward, until the pan is full, pour cold or warm water on them, put the pan on the stove and when the water boils, or reaches the scalding point, the plates can easily be cleaned. A little rubbing with soap and a small scrub brush will take off the last specks, and a dry towel will complete the operation.

If you have many to do, the shallow pan will be inadequate. I used a galvanised iron box 10 in. long, 6 in. wide, and 6 in. deep. This size is chosen because I wash my 5×8 negatives in it. I also have a corrugated iron rack which just takes in a $3\frac{1}{4}$ plate between the corrugations and



will just drop into the box above mentioned. In this box 40 to 50 plates can be put by putting two into each groove. This box can be put on the

stove and the gelatine boiled from the plates in a few minutes. They can then be transferred to warm water and given a final washing as with the shallow tray. The tinsmith will make the box for a trifle, while any one who can tinker with tools can make the rack of strips of galvanised iron, riveting them together at the corners. The corrugations are the only difficult parts, but they can be easily made if one has access to a strong machine—like a large lathe—which has wide cog wheels. Cut some strips of galvanised iron as wide as the cogs allow and two or three times as long as the finished rack is to be, and run them through the wheels. In this way very regular corrugations can be quickly made. By the use of this simple apparatus I utilise my old and spoiled negatives and avoid the necessity of spending money for cover glasses.

THE JOLY PROCESS OF NATURAL COLOUR PHOTOGRAPHY.

In response to several requests, we reproduce the instructions issued by the Natural Colour Photography of Dublin, for the use of the screens employed in the Joly process of colour photography.

Directions for using the Lined Screens.

The taking screen is lined in orange, yellowish-green, and blue; its general colour is a yellowish green. The viewing screen is lined in red, green, and violet; its general colour is grey. The taking screen is used in obtaining the negative; the viewing screen is used, superimposed upon the positive finally obtained, to reproduce the colours of the original object, which appears as a transparent photographic image in the natural colours.

Taking the Photograph.—The taking screen is placed in the ordinary camera double back or dark slide, turned with the lined surface inwards. The sensitive plate is placed against it, the sensitive film being in contact with the lined surface. (If the partition in the double back is attached by a hinge, it may be necessary to do away with this attachment.) To preserve the sensitive film in close contact with the lined screen, it is advisable to place a piece of folded black cloth or paper behind the photographic plate. These operations are, of course, effected in the dark room and by a feeble red light only.

In taking a photograph, the focussing is accomplished in the ordinary manner. If a very open stop is used, the displacement of the sensitive film from its normal position may be corrected for by reversing the ground-glass focussing screen, so that the ground surface is outwards.

The exposure required with the particular make of photographic plate used, and the conditions of lighting, &c., must be found by experience. A correct exposure is essential to the reproduction of clear, brilliant colour. It is, hence, very advisable that, till experience is obtained, a careful record of all trial exposures be preserved; plates sensitised to the entire range of visible wave-lengths must be used. Such are the Cadett spectrum plate and the Lumière panchromatic plate. The latter for fast work; the former shows, on the whole, the more satisfactory distribution of sensitiveness.

After the exposure has been made, development is effected in the usual manner.

A satisfactory developer is made by dissolving the contents of a metol cartridge in eight ounces of water, and adding from twenty to thirty grains of hydroquinone, only using when all crystals are dissolved. A good developer, also, is rodinal for this class of work.

The negative obtained should be clear, soft, and full of detail, but not so soft as to be deficient in vigour. Development may be pushed till the image in outline is visible on the back of the film. Examination of the negative with a lens will, in general, show at once whether a correct exposure has been made. White objects, if illuminated by white light, should show equal density of silver deposit on each linear area. To secure the correct proportional transmission through the three several linear areas of the taking screen, the ultra-violet light must, of course, be cut off from acting on the sensitive film. The pigments upon the taking screen are not adequate to effect this. Hence, in taking the photograph, it is essential to use an orthochromatic screen, carried in the usual manner, either in, behind, or in front of the lens. As it is very important that this screen should be proved for use with the particular class of colour-sensitive plate employed, directions are given further on for testing this screen. The screen, in fact, does more in general than cut off the ultra-violet light, it serves to so control the transmissions through the lines as to bring them into proper photographic equality.

The Positive.—The negative being obtained, a positive is printed by contact from it in the usual manner. In a word, a good clear lantern plate is prepared from it. The adjustment of the viewing screen upon this positive (when the latter is quite dry) requires a few words of direction.

On placing the viewing screen against the positive, bands of colour will be seen, generally, to cross the image. As the lines on the viewing screen are brought into parallelism with those on the positive, these bands appear to widen, and finally disappear, the picture now appearing in colours, but, in general, in erroneous colours. It is now requisite to shift the plates relatively to one another carefully till the right position is reached. The tints then come true.

With a very little practice this operation comes so easy that no mechanical aid is desirable; indeed, it has been found possible to give a lantern display using but two viewing screens, the one positive being adjusted while the other was being shown. (In such a case a window in the lantern, glazed with white paper, is essential, against which to regard the colours.) Spring clips, clipping the edges of the plate, were placed in position before inserting in the lantern.

In order to preserve the positive permanently mounted against the viewing screen, it is only necesary to bind both together with the usual binders. One other observation is required with reference to registering the viewing screen upon the positive. It is to be borne in mind that the three several colours—red, green, violet—upon the viewing screen must fall upon the lines on the positive in a certain order corresponding to the order in which these have been derived from the taking screen. This order may be found by trial; but the necessity of trial may be avoided by attending to the position of the name and date stamped upon the one margin of each screen. If the taking screen is so placed in the camera that the lettering is downwards, then, subsequently, the viewing screen must be applied with the letters above the erect image—the letters must, in fact, bear the same positions respecting the image.

In the great majority of cases the correct registration of the viewing screen is at once determined by the recognition of the colours of the original object; but, should cases arise in which this mode of securing registration would not be satisfactory, an object of known colour may be included along with the object photographed, or, what amounts to the same thing, a portion of the sensitive photographic plate may be given a known colour. This is effected by dipping one edge of the plate, some time before inserting it in the back, in a highly coloured thin Japan varnish. Fuchsine and chrysoidine orange will impart a fine scarlet to this medium, which dries rapidly when exposed to the air. When subsequently registering the positive, a little of the same colour on clear glass may be observed for comparison. The viewing screen is correctly fitted when this colour appears reproduced.

The Orthochromatic Screen.—In order to judge of the nature of the orthochromatic screen required with the particular quality of sensitive plate employed, a photograph should first be taken with the lined screen only. The object photographed should be a piece of dead *white* paper placed in a white light (bright light from a white cloud is best) crossed by a red, a green, and a blue ribbon, intervals being left between the ribbons in which the paper shows up. The lined screen should be so placed that the lines cross the image of the ribbons and the intervening spaces transversely.

On developing this plate (a proper exposure must be given), it will be seen, in most cases, that the density of silver deposit over the image of the white paper is greatest on those linear areas, which had been overlaid by the blue lines of the taking screen, and nearly equal in density where overlaid by the green and orange lines, the latter being rather the least dense. In examining the negative, the lines may be traced from the images of the several ribbons, and so identified as to which particular colour on the taking screen was responsible for the transmission of the light.

When the effects observed are as stated, the orthochromatic screen must be prepared from a medium absorbing from the ultra-violet downwards upon the spectrum. Picric-acid stained gelatine will be found very suitable; a small quantity dissolved in cold and filtered water may be used. Thin glass is preferable for carrying the gelatine. Any density of colour required can be obtained by soaking for a longer or shorter time in the solution; it is well to prepare a number of grades of intensity of colouration, and number these. A few trials, making note of the screens used, will suffice to determine the shade requisite to secure the correct proportional transmission, which, as already observed, is best judged by obtaining uniform density over a white object. The paper and ribbons should be used for these trials.

If the negative obtained without the orthochromatic screen shows a preponderating transmission of the orange lines over the green lines, it will be requisite to impart a slightly greenish hue to the orthochromatic screen. This is best done by dipping the gelatine-coated plate into a solution of ethyl green, washing in water for a few minutes, and then dipping in a solution of picric acid, and again washing. The shade and depth of colour may be regulated readily in this manner.

Lantern Work.—When used for lantern work, it is not desirable to magnify the image excessively; small, and consequently bright, images on the screen are the best. The lantern, if with a blow-through jet, should be provided with an alum or water cell; excessive heat will be found, especially if a trace of moisture is present in the pigments, to fade and damage the colours more than days of exposure to bright sunlight.

While everything is done to secure permanency to these colours, under ordinary conditions of exposure to light, the Natural Colour Photography Company do not guarantee the permanency of the pigments. The pictures should be preserved from damp. It is a wise precaution to preserve the taking screen against all risks in the dark slide of the camera, which should be kept in a dry place.

Albums made under the patent of the Company for displaying the transparent photographs to most advantage, while at the same time guarding them against risk from breakage, are obtainable on application at the offices of the Company.

Orthochromatic screens proved to any make of colour-sensitive photographic plate will, if required, be supplied at an extra cost with the sets of screens.

ACETYLENE GAS FOR ENLARGING.

Mr. Henry Dietrich, in *Anthony's Bulletin*, gives the following translation of an interesting article in the *Photo-Chronik* on the above subject:—

The mother substance of acetylene is carbide. By this name we understand compounds of carbon with metals. They are produced in the electric furnace at a very high temperature. Calcium carbide is mostly employed for this purpose. The calcium carbide originates by uniting one molecule of lime and three molecules of carbon, besides liberated oxide of carbon, after the following chemical equation:—

$$CaO + 3C = CO + CaC_2, \text{ that is, calcium carbide.}$$

This calcium carbide decomposes in water to acetylene and hydrate of lime, as per formula:—

$$CaC_2 + 2H_2O = Ca(OH)2 + C_2H_2, \text{ that is, acetylene.}$$

One kilogramme CaC_2 furnishes about 0·35 cubic centimetre of C_2H_2 gas. The price of 1000 kilogrammes carbide is about 60 marks.* With suitable gasometers and burners it can be used directly as light source.

The disagreeable smell of the acetylene comes from phosphoretted hydrogen (0·3 per cent.) and sulphuretted hydrogen, always accompanying the same. Phosphoretted hydrogen can easily be removed by directing the gas through bromine water or a silver solution. The latter solution has the disadvantage that it forms acetylene silver, which explodes very easily. Berthellot, however, has investigated the explosive properties of acetylene, and found that the C_2H_2, when under atmospheric pressure, will not extend beyond the point of decomposition, and that acetylene can, therefore, be designated as being not dangerous. Acetylene gas of more than two atmospheric pressures shows all the properties of explosive gas mixtures, and an explosion is not excluded when by an insufficiency of water supply to the carbide a local heating takes place, admitting a condensation of the gas to two atmospheres.

In the production of the acetylene a good-sized gasometer of glass should be used. A copper apparatus should be avoided by all means, as the acetylene will unite with copper to form a very explosive compound. The pipes for conducting the gas may be of iron. The liquid closing the glass globe should be a chloride of sodium solution, not water, the latter dissolving more than one per cent. C_2H_2.

The C_2H_2 should be cleaned before it is collected in the gasometer. Professor Pictet uses for this purpose a number of liquids cooled to 16° C.:—

1. A strong concentrated chloride of calcium solution.
2. Lead compounds.
3. Sulphuric acid.

Tests have shown that at this temperature the impurities are absorbed, but not the C_2H_2.

The essential properties of the acetylene are the following:—

1. Great power of illumination.
2. Great transplanting rapidity of the flame.
3. Very low igniting temperature.
4. High temperature of combustion.
5. Explosive power.

The dangers in the use of acetylene as a light source are not greater than those of ordinary illuminating gas.

The assertion that the C_2H_2 offers a great advantage to the photographer as a light source is therefore fully justified, and it will be very useful for projections. Its chemical light intensity has not been fully determined yet.

THE ACETYLENE LIGHT IN AMERICA.

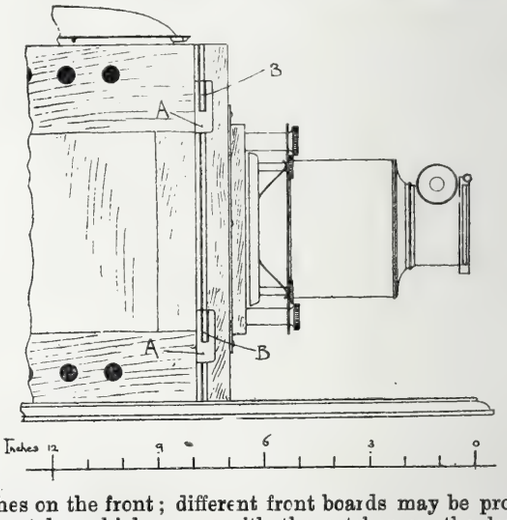
Acetylene gas seems to be very slow in coming into such general use in this country as its merits would premise. The accidents occuring in the handling of this gas having been widely reported by the press, mainly on account of the novelty of the process, have caused much comment and have, undoubtedly, led to the risk being greatly overrated by the general public. With regard to an objection which has occasionally been urged against acetylene, namely, its poisonous qualities, says the *Pictorial Photographer* (New York), it has been shown to be, as a matter of fact, less poisonous than coal gas; while its unmistakable odour makes an additional safeguard against accident from this source. Acetylene, under certain conditions, attacks copper, forming an explosive compound known as acetylide of copper; but, unless the acetylene contains considerable ammonia and moisture, its action on copper is imperceptible. With brass no appreciable action takes place. When calcium carbide is stored so that it will not be acted on by moisture, and used in generators constructed in a rational manner and of good workmanship, it does not appear that there is any more risk to be feared from the use of acetylene as an illuminating agent than from coal gas, kerosene, or the electric light. The fatalities that have occurred have mainly taken place where the gas was being handled in liquid form and under heavy pressure. We warn all experimenters in this direction that they cannot be over-cautious. It was while a German chemist was perfecting his apparently successful means of depriving the liquid acetylene of its explosive quality that an explosion occurred, killing himself and three assistants. All record of his experiments perished with him. Handled dry, in generators such as that manufactured by Walmsley, Fuller & Co., of Chicago, and taking ordinary precautions, the light has proved harmless and a distinct success in studio lighting. With a cluster of thirty lights, made by soldering smallest gas burners into a piece of tubing, and attaching same to the generator by flexible tubing, a fully timed and beautifully lighted portrait has been obtained with two seconds' exposure. For babies it is too slow, but for large heads and artistic portraiture it is a success; and, as the stand holding the light may be easily moved or placed anywhere in the room, a command of lighting and a means of obtaining striking effects is obtained, such as could not be accomplished by any other illuminant. The actinic values of the acetylene light are identical with sunlight. The black-and-white contrasts and deathlike gleam of the electric and Welsbach light fail to render the lifelike flesh tints as with daylight and the acetylene. In conclusion, we predict a steady march along the line of improvement, sweeping away predjudice, and the universal use of this beautiful illuminant. In city galleries during foggy weather, or where night work is done, it will win its way on its merits alone. For the magic lantern it is the ideal light, and certain portable generators are becoming very popular. We recall the pleasure with which we first viewed its advantages over the oil light, and also subsequently the Welsbach. Its cost is slightly higher than either of those, but cheaper than oxyhydrogen or electric. When first we began experimenting with calcium carbide, we paid for it 75 cents per pound; since then, it has been quoted less than one-sixth of that price.

* Equivalent to 14·55 dollars.

SMITH'S IMPROVED OPTICAL LANTERN.

The improvement consists of a means by which various optical arrangements can be quickly exchanged, and which makes one lantern body suitable for various optical fronts.

The lantern is built in the usual way except that the front board carrying the condenser stage and objective is separate from the body; on the body of the lantern are metal or other catches which engage with



other catches on the front; different front boards may be provided, each fitted with catches which engage with the catches on the lantern body; different optical arrangements, such as projection microscope, polariscope vertical front, and suchlike may be each on a front board with catches which fit into the catches on the lantern body.

A single lantern is made suitable for the same purposes as a complicated double or triple lantern.

One system of catches is shown in the accompanying drawing, where A is the plate with a slot fastened to the lantern body; into this slot a pin, B, fastened on the front, engages, so that the front is held securely, and can be removed by merely raising it up.

THE CARE OF INCANDESCENT GAS BURNERS.

"Having been a great deal bothered with my incandescent gas burners, perhaps my experience may be of use to others in the same plight," says "Glatton," in the *English Mechanic*. "After having them fixed, I soon found a woful waste of gas was going on, and, on examination, I noticed that, soon after lighting, the flame from the Bunsen burner, which was of a red colour, extended considerably above the mantle. On unscrewing the tube, I found that the five or six small holes through which the gas issued had been reamed out by the gas-fitter till a medium-sized pin would easily pass through them. As it was impossible to close them by burnishing, I stopped two by dropping two pins into them, from which I had removed all the shanks except about $\frac{3}{16}$ in. length. The heads closed the holes like two little valves. On screwing the burner together again I found I had reduced the height of the flame, but that another very serious fault was still present. On turning the gas on, the by-pass flame

often went out before the Bunsen flame was lighted, and, when turning the Bunsen down, the bypass often failed to ignite. At night, too, the bypass would sometimes go out, an escape of gas being the result.

"It was a long time before I found a remedy, and though much better I find even now that, if turned on or off too suddenly, the flame sometimes goes out. The Bunsen being fully shut off, I adjust the top screw till the yellow tip of the bypass flame has a depth about equal to its diameter. I then turn the burner full on, and lower it till the Bunsen flame is only *just* turned off.

"When the cock is in this position, the bypass will generally flicker, and the lower screw will be found to control it. I adjust this screw till the bypass again shows a spot of yellow flame as broad as it is deep. It then seems to give the minimum of trouble. Will some one who knows give a description of the orthodox method of adjusting these screws, especially the lower one? Can I do anything more towards preventing extinction when turning the flame rapidly on or off?

"I have lately been shown by a friend a little set of apparatus called the 'incandescent burner doctor,' which has enabled him to keep one mantle going for a whole year. I don't know where it is to be obtained, but, if the maker will advertise, I can promise him at least one purchaser. It consists of a box containing two turned wooden stands, a small brush, and a delicate hook for lifting the mantles with. The burner is slipped on to one stand, the mantle is then lifted with a steady hand and placed on the other. The pipeclay fork is removed, and, after unscrewing the tube, the burner is freed from dust with the brush. The burner is then again put together, and the mantle rehung, when it is once more good for service.

"I am trying a preparation called magnesium carbide, which seems to have a very beneficial effect on the mantles. I have not had it long, but I think the light is certainly improved. As the directions for use are not as clear as they might be, I will describe Mr. Williams's mode of applying the solution.

"The burner is turned full on and lighted in the usual way, and the gas is then lit inside by applying a lighted match to the air holes just above the cock. After burning for about a minute, the solution is painted on the outside of the tube over the whole of its surface between the upper and lower ends of the three brass brackets which support the ring which carries the chimney. The cock is now turned off, and then on again, so as to ignite the gas outside only, as usual, and the carbide, although dry, gradually evaporates, and by deposition on the mantle improves its light-giving power, strengthens it so as to be less liable to fracture, and, Mr. Williams assures me, he has found a smoked mantle become white again after its use.

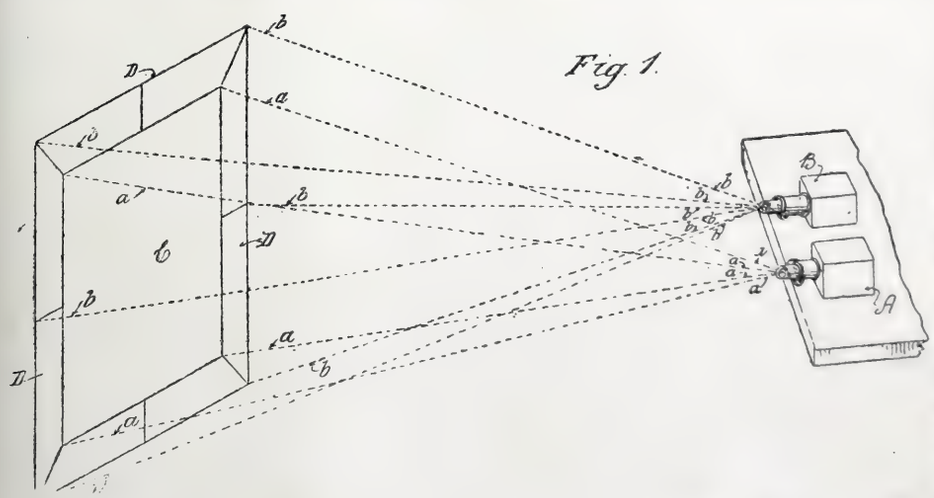
"Of course, the chimney is not removed when applying the solution. It is claimed that old torn mantles are so toughened that they receive a new lease of life."

BORDER PIECES FOR LANTERN PROJECTION.

Messrs. Cowan & Iles have devised some improvements relating to the production and exhibition of representations of pictures, advertisements, &c., the object being to produce representations upon "projecting screens" of set pieces, borders or frames of various designs or delineations, combined with photographic pictures or representations upon the same screen, and simultaneously.

They employ two or more "projecting" lenses, focussed to produce a combined representation, one of the lenses being of wider angle to that of the other lens, and set up so as to be worked together.

Fig. 1.



One of the lenses will be employed for projecting photographic or pictorial representations on the centre portion of the screen, and the other lens or lenses is or are to be used with a different light or illuminant to project a representation or representations serving as a border or framing to the centre portion of the picture.

The illuminants employed should preferably be, for one lens, for instance, the centre picture lens, the electric light, and, for the other lens or lenses, the limelight.

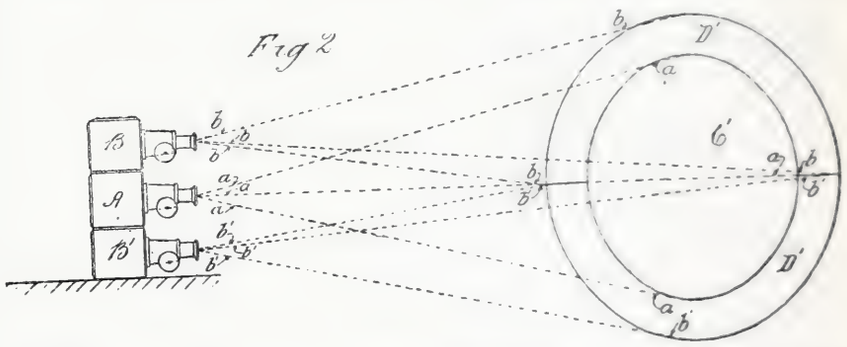
In this way some portion of the rays of the outer presentation will, when two lenses are used, have to cross the lines of the rays of the central representation, and therefore the character of the illuminant is diversified; but, whether this be adopted or not, the lenses are worked side by side and focussed relatively to each other, so that the picture presented in its entirety will be of the duplex character specified.

According to a modification of this application, particularly for outdoor presentations or exhibits, the duplex character of the projection illuminant and projection rays may be employed by way of three lenses arranged side by side, or above and below the centre projection lens, the outer two of the lenses being employed to represent and present two half portions of the border of the picture, and so that the projected rays will not cross those of the centre presentation.

Fig. 1 represents the employment of two projection lenses, A, B, combined with the bordered projection screen, C, D. The lens, A, is to be of "lesser angle" than the lens B, and they are to be focussed and used to effect from the lens of the lesser angle of projection a representation upon the portion, C, of the projection screen, the lines of these rays being indicated by the dotted lines, *a*; and from the lens, B, of "large angle" the rays projected are indicated by the dotted lines, *b*, and represent a border or frame to the centre picture.

These lenses, A, B, as shown, are supported upon a table and arranged side by side, the lines of the screen, C, D, being shown rectangularly arranged.

Fig 2



In the fig. 2, the bordered representation screen, C^1, D^1, is represented by curvilinear lines, but the two sets of lenses, A, and B, B^1, are arranged in tier, lenses B, B^1 being above and below the lens A. The lenses, B, B^1, are of larger angle of representation to the lens A, but the said lenses will be focussed to, and will project respectively the portions of the border representation at D^1, and in this way the rays will be thrown on the screen without intercepting or crossing, and the illuminant used need not be diversified.

MANCHESTER PHOTOGRAPHIC SOCIETY.

Lantern Section.

The first meeting of the Forty-third Session of the above Society was held at the rooms, 44, Mosley-street, on Wednesday evening, October 27, when Mr. Jas. G. Chapman gave a description of the cinematograph.

The President (Mr. J. Wood) introduced the lecturer to a large audience, and Mr. Chapman began by saying that, no doubt, most of those present had seen animated photographs projected on the screen by one or other of the different machines now in use, but he said it would be his purpose to explain to them, as well as he was able, how these pictures were produced, and how they were shown upon the screen.

Before describing the machines, however, the lecturer first showed two pieces of film which were perforated at both edges, one piece with a circular perforation (the standard of Lumière), the other with a rectangular perforation (the Edison standard), which latter is the one mostly used in England.

The lecturer said that the machines at first sight resembled the movement of a clock, each wheel being geared into some other to attain the different speeds at which they are required to revolve.

By means of a diagram Mr. Chapman showed how these machines were filled with sensitive film for exposure. Connected with the machine was a shutter, arranged so that, when the film was being pulled down into position for another exposure, it covered up the lens; uncovering it for making the exposure.

The average number of these exposures was fifteen per second, during which time the sprocket wheel stopped for each exposure.

He said it was due to the mechanism for producing this momentary

stop that these machines were so noisy. The lecturer described the development of the films, eighty feet long (and sometimes longer), which he said was done in this country by means of a framework of the shape of a St. Andrew's cross, into each arm being fitted a number of pegs, round which the film was wound. After describing the machine used for projecting these pictures (which the lecturer said was the same as that used for "taking"), about two dozen films of various subjects were shown through the lantern, and were much appreciated by the audience.

The President then called upon Mr. A. Heywood to propose a vote of thanks to Mr. Chapman and his assistant (Mr. Macdonald) for the excellent description and exhibition they had given.

Mr. Heywood, in his remarks, thanked the lecturer for the short but very concise manner in which he had described the mechanism of the cinematograph.

Mr. H. Woolley said he had great pleasure in seconding the vote of thanks, to which Mr. Chapman replied briefly. He afterwards showed a machine, separate from a lantern by means of which the mechanism was fully shown.

THE MAGIC-LANTERN JOURNAL ANNUAL, 1897–8.

Edited by J. Hay Taylor. Published at 9, Carthusian-street, E.C.

The second issue of this annual gives as its frontispiece an excellent portrait of the editor, from a negative by Mr. Hubert, of Hackney. A considerable number of articles on topics connected with optical projection are included in the volume. They emanate from practical writers, who are *au fait* with their subjects. Notices of apparatus, lists of importers and exporters of lantern goods, and other useful information complete the annual, which is well got up.

THE PRIMUS ALL-SIZE LANTERN-SLIDE MASKS.

W. Butcher & Son, Blackheath, S.E.

Messrs. Butcher have sent us a sample box of these useful lantern transparency masks, upon the front surfaces of which series of concentric circles, rectangular lines, &c., are drawn, so that, by the aid of a knife, openings of the desired size and shapes, to suit the fancy of the individual, may be cut, the lines referred to serving as guides. The masks are of opaque paper, and have spaces for titles and indicators. They should be popular with lantern-slide makers.

CATALOGUES RECEIVED.

Walter Tyler, 48-50, Waterloo-road, S.W.

Mr. Tyler has placed before us that portion of his mammoth catalogue which deals with lanterns and slides for projection; of the latter there are innumerable popular series, while the catalogue illustrates a great variety of cinematographic and lantern apparatus. Special prominence is given to a new lecture dealing with the Queen's reign, which has been compiled with the assistance of the authorities of the British Museum, Messrs. Graves, and Messrs. Downey. We note as a point of interest that Mr. Tyler's stock of slides reaches the amazing number of 500,000, a truly remarkable tribute to the popularity of the optical lantern. Mr. Tyler's catalogue should be in the hands of all those interested in lantern matters.

Newton & Co., 3, Fleet-street, E.C.

Messrs. Newton's supplementary list for 1897–8 includes many attractive series of slides, among which may be enumerated Nansen's Polar Expedition, reproduced from the illustrations to the celebrated Doctor's book; *The Life of Christ*, from M. Tissot's drawings; the Diamond Jubilee; *The Naturalist in Australia*, &c. At the same time Messrs. Newton have handed us their special lantern-slide catalogue for trade purposes, the sets comprising educational, scientific, medical, agricultural, botanical subjects for schools and technical education; scriptural subjects; views of all countries, and comic tales, &c.

STEREOSCOPIC PHOTOGRAPHY.

I am convinced that the careless or ignorant way in which many commercial stereoscopic slides are prepared and issued to the public brings discredit upon that beautiful form of photographic art; for ordinary purchasers are unable at the time to discriminate between properly and improperly mounted slides, says Mr. E. B. Docker in the *Australian Photographic Journal*, and, when they come to examine their purchases in the instrument and find either none or a false stereoscopic effect, or feel the strain upon the eyes in attempting to unite the pictures becoming intolerable, they throw away the thing in disgust.

Of course, the mounter may sometimes accidentally transpose the pictures, especially if he has not the faculty of viewing them stereoscopically without the instrument, but it seems inconceivable that a reputable firm should not carefully examine each slide before allowing it to go into stock; but there is one instance within my knowledge which leads me to the conclusion that it is sometimes the result of ignorance of the principles of stereoscopic vision. Looking stereoscopically at some slides in a photographer's window, I saw that they were transposed, in fact they were simply undivided prints, just as they came from the negative. I went in and explained to the photographer that they were wrongly mounted, and that the effect, instead of being real, was pseudo-scopic. He assured me that they were only mounted thus for show purposes in his window, merely to indicate that he sold stereographs, but that those he sold were properly mounted. Nevertheless, some time afterwards, I saw a set from this establishment which were all, without exception, simply undivided prints pasted on the slides, and the purchaser, to whom the subjects were of personal interest, had to get the slides cut in half and glued on other cards, giving them, of course, a very clumsy appearance.

Not long ago, a visitor to Tasmania brought back a dozen or so of slides of some fine scenery, which he had purchased from a well-known firm, the name of which is usually considered a guarantee of good work; and, on looking through them, I found no less than two or three transposed. The owner had been much puzzled with the strange effect.

At one Photographic Exhibition in Sydney, a competitor in the stereoscopic section exhibited some slides which merely consisted of duplicates from the same negative; and what is more remarkable is that they were actually commended by the Judges! An illustration of the way in which "judging" is sometimes done. I should not have been much more astonished if they had been awarded the prize, for the prints were good.

A common fault with ordinary commercial slides is that the pictures are mounted too far apart, they are cut too wide, under the temptation to get in more of the subject. I have frequently found the measurement from object to object as much as three and a quarter inches, and I have even found some to go as much as three and a half inches. Ordinary eyes cannot unite such pictures, or, if they can manage it for a few seconds, after looking at a few slides, the strain wearies the muscles of the eyes and causes headache, and as a consequence the stereoscope gets a bad name.

A New Acetylene Lamp.—M. Gossart has invented a new acetylene lamp which possesses some distinctly novel features. The water is brought into contact with the carbide by means of capillary tubes, and therefore in very minute quantities. By turning off the water tap and the gas outlet tap together, the evolution of gas is stopped, no more being generated till both taps are turned on again. When the water tap only is turned, the disengagement of gas gradually stops. If, on the other hand, the gas tap is turned off, the gas continues to be evolved until the pressure drives back the water in the capillary tubes, and thus they act like safety valves.

From Mr. G. Albert Smith, of St. Anne's Well and Gardens, Furze Hill, Brighton, we have received his list of English films for cinematographic projection. Many attractive and amusing subjects are embraced in the list.

Mr. W. Emery, of 3, Soho-street, Oxford-street, W., sends us his list of lanterns, jets, slide masks and binders, and sundries for optical projection work.

The Sunlight Incandescent Company.—Mr. J. H. Duncan recently presided at the meeting of the New Incandescent (Sunlight) Company. He said, although they did not pay a dividend now, they had something that would spell dividend before very long. When they first came to make mantles on a large scale, some of them turned out well and others very badly, the latter being sent back; but now the mantles sent back did not amount to more than 1*l.* or 2*l.* a week. They were fighting with very able and powerful opponents. The traders' agreement, issued by the Welsbach Company, was almost unique in English commerce—probably due to its German origin. It bound down those supplied with the Welsbach mantles not to sell those of any other firms. The difficulties were, however, now being overcome, and he thought he might almost say that they had got round them. They had been forced into law, but they had won their point. The vendors gave 8250*l.* towards the expenses they had incurred in law and other ways. There were two vacancies on the board of directors, and he wished the shareholders to select them. As to the directors' fees of 1500*l.*, the work had been very heavy, and, if the shareholders could point out how the work could be done more cheaply, he should be glad to confer with them. A long and somewhat lively discussion ensued. It was initiated by Mr. Lamont, who complained that the prospectus set out that a "white mantle" was an accomplished fact, while it was now stated that they were negotiating to obtain one. Mr. Low followed in a similar strain, and expressed his opinion that without a "white mantle" they could do nothing; and, if they did get it, he considered that the vendors should pay for it.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*December* 3, 1897.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

Dr. Elmer Gates, the inventor of the tele-microscope, which is described elsewhere, is said to have succeeded in applying the same principle to the telescope. According to his theory, a ten-inch telescope can, by means of the new tele-microscope, be made to magnify 25,000 diameters; and, if the microscope attachment be applied to the larger telescopes, the moon would be brought to within twenty-five miles of the earth, so that objects thirty feet wide could be seen.

* * * * *

The use of acetylene for driving engines is stated to be entirely possible, as shown by a series of experiments conducted at Compiègne by Cuinat. It was shown that acetylene develops fully three times the energy of the usual illuminating gas, and the only change needed to transform an ordinary gas engine into an acetylene engine was a reduction in size of the intake valves. The best mixture was found to be ten of air to one of gas. With these proportions, it was found that engines ranging from eight-horse power to sixteen-horse power cost about six centimes per horse-power hour at the present rate of calcium carbide.

* * * * *

At the Imperial Institute, recently, Mr. E. S. Bruce gave a lecture on his system of electric balloon signalling as applied to scientific exploration in Arctic and Antarctic regions. After pointing out how great an advantage it would be for a party to have a means of communicating with the ship when away on an exploring expedition, the lecturer described his system, in which a group of electric lamps was mounted inside a balloon connected with the earth by an electric cable. The operator and most of the apparatus would be on the ground or the deck of the ship, and therefore the balloon could be made easily portable. Goldbeaters' skin would be the best material to employ for the covering, and the smallest size of balloon he could recommend for Arctic exploration purposes would be about seven feet in diameter, with a capacity of 150 cubic feet, and able to lift 500 feet of cable. The necessary gas could be stored in steel tubes, or a portable gas-making machine might be carried. The source of electric power would be a dynamo, with which Mr. Bruce supposed every future Arctic expedition would be provided, and this could be operated by wind power, if coal ran short, or even by hand. By giving long and short flashes on the lamps, it would be possible to convey messages in the Morse alphabet.

Mr. D'Eyncourt gave his decision at North London, on Friday last, in the case of Askew *v.* Deuxbury and Green, which was a summons taken out at the instance of the police for wilfully obstructing the public footway in Mare-street, Hackney.—The evidence given on the last occasion was that Deuxbury, a greengrocer, let the upper part of his premises to Green, who is a magic-lantern operator, and who had hit upon a plan of advertising by means of lantern slides. Before showing his advertisements, Green would attract a crowd by throwing on the sheet a ship in full sail, followed by a picture of a policeman chasing a dog, and a couple of boxing men. It was alleged that this crowd impeded the public right of way. Mr. D'Eyncourt said he felt he must convict in the present case. There was an undoubted obstruction when several hundreds of people assembled in the narrow part of Mare-street, and, as the defendants continued the exhibition after having been cautioned by the police, there was evidence of "wilful" obstruction. The defendants would only be fined 5*s.*, with 2*s.* costs each. If, however, the offence were repeated, the fine would be far heavier.

LANTERN MEMS.

Advocates of the oxy-ether light are constantly singing the praises of the same, and, if not ridiculing the fear of danger shown by some lanternists and writers, speak of the apparatus and the method of using same as though it were A B C work to the uninitated. I have no desire to enlarge on the frightful results of the careless use of ether at the Paris Bazaar beyond using the fact as an instance of what has happened with professional lantern operators, while every now and then amateurs and others have difficulties running close to dangers when using what are supposed to be safety apparatus.

* * * * *

What shall we say to those responsible for the selection of the apparatus for the London School Boards if they have decided on ether-saturator apparatus for the lanterns they purchase, and which, I presume, will have to be used by schoolmasters and others who, most probably (in some cases at any rate), have had little or no previous experience with the oxy-ether light? I consider, with the record of past disasters before one, and the trouble previously given by several of the patterns of oxy-ether apparatus, that *no one* should use this light where large audiences congregate, or where panic is likely to be caused by a large flame or extra big "pop."

* * * * *

Personally, I like the light produced by using oxy-ether saturators, and have used it for lantern demonstrations and army signalling, but I have had strong proof that it is not safe under all conditions to use this light, and discontinued using or recommending its use long since, for the ugly blow-up of saturators and the wreckage caused to apparatus was sufficient evidence that certain patterns at any rate are not available for indiscriminate sale and use. In the case of the Army, I believe the Government advisers or experts decided against it being used for signalling on account of the dangerous nature of ether.

Now that the Progressives have a working majority on the School Board, they will have a free hand, and can increase the rate to their hearts' content, but it is to be hoped they will spend the money intelligibly, and, while avoiding extravagance, not be penny wise and pound foolish, as in some instances they have been in the past, where delicate and expensive apparatus have been supplied, and no proper case or protection for it, so that it was liable to be soon injured, if not rendered useless by exposure to dust and accident.

* * * * *

Some very good "effect slides" of the Jubilee street decorations have been put on the market which are very telling on the screen, the houses and streets being photographs, coloured, while the flags stretched across the street are drawn in and coloured, the negative having been blacked out for the purpose so as to get clear glass. In this way the purity of the colours is much enhanced. The scenes of the Strand, Piccadilly, and the Mansion House, are very attractive.

* * * * *

I noticed a curious effect on looking through a lantern transparency the other day at a gas flame. The light was surrounded by a halo with all the colours of the spectrum, in fact, produced Newton's rings. It was a French photograph with thin glass for both film and cover glass, and I suppose had been put up slightly damp, and the binding had produced sufficient pressure to form the structure of the particles of moisture necessary to give the rainbow hues. I have produced this effect with lenses in contact while slightly damp when the countercell of the lens has been screwed up tight, but I don't ever remember seeing it in a lantern slide before. I must put it in the lantern at first opportunity and see what effect, if any, is observable on the screen.

* * * * *

As insurance companies give better rates to those buildings that are lighted by electricity instead of gas, many theatres, halls, places of entertainment and hotels are dispensing entirely with gas, and consequently will not allow apparatus which require the lime light to be used in the buildings. Travelling lanternists will be wise to provide themselves with some form of arc lamp, so that, when called on to operate at one of such places, they may be prepared. The owners or lessees of these properties are now realising it is to their interest to have suitable "leads" from the main electrical supply to a position near the most convenient place for the apparatus, so that the operator may connect the same to his resistance and lamp.

* * * * *

The amount of resistance necessary will depend on the current supplied to the building, which, as a rule, is somewhere about 100 volts, so that a resistance of 7 or 8 ohms is sufficient. It may be that a 200-volt current is supplied, and then a larger resistance must be used, or two of the ordinary size in series. It is a good plan to have a certain amount of adjustment to the resistance, so as to increase or decrease the ampères of electricity used, and consequently increase or decrease the light. Very convenient and portable resistances of this kind are now being made from manganine or platinoid wire mounted in iron frames. G. R. Baker.

MEASURING THE DURATION OF FLASHLIGHT EXPOSURES, AND THE SPEED OF SHUTTERS.

A paper was read by York Schwartz at the Convention recently held at Hanover. It describes a method of arriving at these measurements by means of a swinging pendulum, as shown in the following abstract. A small quantity of mercury is enclosed in a glass tube and attached to a wooden rod of suitable length. This may be done by means of a knitting needle fixed at the end of the rod and piercing the cork closing the tube. Another piece of steel wire traverses the rod at the other end, and forms the axis upon which the pendulum is to swing. The pendulum is suspended against a wall by a suitable grooved support, upon which the axis rests. The rod should be one metre long, measured from the axis to the end of the tube of mercury. Blacken the wall and the whole of the rod, excepting where the mercury is visible. Draw a vertical line on the wall immediately behind and corresponding to the pendulum at rest. From a point on this line, corresponding to the lower end of the pendulum, mark off 79 millimetres in an upward direction. Through this second point draw a horizontal line extending 390 mm. to the right, and 390 mm. to the left. This line is the chord of an arc measuring 800 mm. With the axis of the pendulum as centre, draw this arc and divide it into 80 equal parts. Each fifth division should be numbered. Cut three small triangles in white paper, and fasten them on the wall in a manner to indicate the two extremes, 0 and 80, and the centre, 40. The camera is set up at a distance that will give an image exactly one-tenth of the size of the original. The scale may be photographed in making the exposure, or it may be drawn in the proportion of 1 : 10 on paper, or glass previously coated with gelatine. In the latter case, the triangles will facilitate the measurement of the curve by superposition of the negative. To measure the duration of a flash of magnesium powder, the pendulum is swung from the starting point 0, and the powder is ignited at the same time. The negative will show the scale and a short curve, which is the image of the tube of mercury in motion. Let us suppose the curve is 5 mm. long, extending from 6 to 11 on the scale; we can then calculate the time from the following table, which gives the fractions of a second occupied by the pendulum in traversing each of the 80 divisions of the arc:—

1. 0·05044	21. 0·00929	41. 0·00804	61. 0·00946
2. 0·03636	22. 0·00915	42. 0·00804	62. 0·00964
3. 0·02590	23. 0·00900	43. 0·00807	63. 0·00984
4. 0·02127	24. 0·00888	44. 0·00808	64. 0·01007
5. 0·01852	25. 0·00877	45. 0·00809	65. 0·01030
6. 0·01666	26. 0·00867	46. 0·00813	66. 0·01060
7. 0·01533	27. 0·00858	47. 0·00816	67. 0·01093
8. 0·01428	28. 0·00850	48. 0·00820	68. 0·01130
9. 0·01345	29. 0·00842	49. 0·00825	69. 0·01171
10. 0·01277	30. 0·00836	50. 0·00830	70. 0·01219
11. 0·01219	31. 0·00830	51. 0·00836	71. 0·01277
12. 0·01171	32. 0·00825	52. 0·00842	72. 0·01345
13. 0·01130	33. 0·00820	53. 0·00850	73. 0·01428
14. 0·01093	34. 0·00816	54. 0·00858	74. 0·01533
15. 0·01060	35. 0·00813	55. 0·00867	75. 0·01666
16. 0·01030	36. 0·00809	56. 0·00877	76. 0·01852
17. 0·01007	37. 0·00808	57. 0·00888	77. 0·02127
18. 0·00984	38. 0·00807	58. 0·00900	78. 0·02590
19. 0·00964	39. 0·00804	59. 0·00915	79. 0·03636
20. 0·00946	40. 0·00804	60. 0·00929	80. 0·05044

We will assume one gramme of powder to have been consumed in the exposure instanced. The table will give the following fractions for the five sections occupied by the curve in the negative:—

7. 0·01533
8. 0·01428
9. 0·01345
10. 0·01277
11. 0·01219

= 0·06802 second = 1 gramme of magnesium powder.

If the curve includes fractions of a degree, that fraction of the time corresponding to the same degree may be taken. This is not absolutely correct, but near enough in practice. The application of the method to the timing of shutters needs no special description.

STORAGE LIGHT.

It is well known that, if a piece of printed white paper—for example, a newspaper—be used to place between sensitive dry plates in packing, the negatives made therefrom will clearly show the printing on a blackened ground. Most photographers, when asked if they ever packed newspaper in between plates with the above result, will say that they never did so but once. It is thought, says Mr. J. Sheperd in *Anthony's Bulletin*, that the unprinted portion of the paper, being white, absorbs or stores up light, which is given off, after packing the plates in the dark, sufficiently to change the plate, while the printed portion, being black, absorbs no light, and therefore does not affect the plate. It may thus be said that the newspaper printing on the negatives is produced by storage light. Others claim that the imprint is caused by the action of chemicals in the paper, and this may sometimes be the case, for I once had the print of a newspaper transferred to some negatives by placing the paper between them after they had been developed and dried. In such a case it is clear that something besides light must have changed the plates. It is, however, quite reasonable to believe that white paper may absorb and give off

light enough to perceptively affect a plate, and certainly the plates thus affected by newspapers are just exactly such as would be made by protecting portions of a sensitive plate in the form of printed matter and then exposing the plate.

Mr. J. E. Atkinson, of the New Britain Camera Club, has recently had an experience that demonstrates the production of figures on sensitive plates by means of storage light. The black slides of his plate-holders are numbered by figures painted in white, the paint being artist's flake white. He had many negatives more or less indistinctly fogged, and for a time did not know the cause; but finally one negative showed in the foliage a distinct figure 5. It should be turned on one side to read the figure. In this particular case the slide was placed on the camera with the marked side in bright sunshine while he was making the exposure on the landscape. The slide was inserted in the holder with the figure 5 on the inside, facing the plate. There was, of course, no contact of the figure or paint with the plate, so that chemical action was impossible, and the only way that the figure could have been transferred from the slide to the plate was by the light stored up in the white paint, and given off after the slide was inserted in the holder. The figure happened to come directly opposite foliage, the part of the plate least affected by the landscape exposure, and therefore its image clearly appears.

In both examples here given of sensitive plates being affected by laying them away when opposite a white and black surface, the negatives were blackened where the plates faced white, and were unaffected where the plate faced black. This indicates that the newspaper marks, as well as the figures on the plate-holder slide, were photographed by storage light.

ENLARGING WITHOUT LANTERN OR CONDENSER.

A meeting of the Gospel Oak Photographic Society was held on Tuesday, November 16, when Mr. Stone read a paper, and afterwards gave a demonstration, on *Enlarging without Lantern or Condenser*.

Mr. Stone said he wished to bring before the members two methods of enlarging without lantern or condenser: first, for artificial light, by means of magnesium ribbon; and, secondly, by daylight. The method which he was going to describe had the advantage of doing away with the costly condenser and still more costly lantern; but, before proceeding to demonstrate the capabilities of his arrangement, he would first deal with the subject of enlarging in a general manner, and would point out what, in his opinion, were the chief points to be considered in making a satisfactory enlargement.

First. *The Negative.*—This should be of good quality, but somewhat thin. A negative which would give a vigorous print in the ordinary way would be unsuitable for enlarging. It should be free from stain, which would greatly increase the time of exposure. Fog or halation should not be present, and the negative should be as free from scratches and other blemishes as possible, as the effect of these would, in the enlargement, be considerably more apparent. Any scratches or pinholes in the film should be filled up either with a pencil or with colour applied with a brush, as it was then easier to remove from the enlargement. On the whole, a slightly over-exposed negative, with all possible detail, was the most suitable for making enlargements from.

Second. *Paper.*—For enlarging by artificial light rapid bromide paper should be used; but for daylight purposes the slow kind was preferable. As to the question of surface, for large work, that with a rough surface was generally used.

Third. *Light.*—The best artificial light was that obtained by burning magnesium ribbon, and if daylight was being used it was desirable that this should be from a northerly direction, and, unless a clear expanse of sky could be obtained, the light should be directed through the negative by means of a reflector placed at an angle of 45° to the negative.

Fourth. *Developer.*—The ferrous oxalate was that most frequently used for bromide work, but it had the disadvantage that, unless it was followed by a clearing or acid bath, it was liable to cause stains. Neither was it so energetic as some of the more modern developers, such as amidol, rodinal, metol, &c., nor could it be so easily modified to compensate for errors in exposure.

Mr. Stone then showed an arrangement he had made for enlarging by daylight. This took the form of a light frame fitting into a window, and covered with a fabric through which no light could pass. In the centre of this frame was an aperture, and underneath this was a shelf supporting the camera, and to this was clamped an attachment for holding the easel, to which the bromide paper was attached by means of drawing pins. This arrangement ensured that the planes of the lens, negative, and paper were all parallel to each other.

His apparatus for enlarging by artificial light consisted of a square box, one end of which was pierced with a hole to admit the lens of his quarter-plate camera, and the other had a board fitting into it, to which the bromide paper was fastened, in the manner before described for daylight enlarging. There was a sleeve attached to the front of the box into which the lens of the camera was slipped, and this prevented the entrance of any light except that coming through the negative, whilst it allowed the camera to be moved to and from the paper for the purpose of focussing. The negative was placed in a frame which took the place of the ordinary reversing back. Behind this was placed a board painted white and acting as a reflector, in front of which were suspended several strips of magnesium ribbon about nine inches long. Between the magnesium and the negative was placed a sheet of ground glass, to diffuse the light and thus secure equality of illumination.

Mr. Stone, after describing his apparatus, demonstrated its effectiveness by making an enlargement from a quarter-plate negative. This was developed with eikonogen and hydroquinone, and was quite satisfactory.

DEVELOPMENT AND PROJECTION OF KINEMATOGRAPH FILMS.

Messrs. Lumière have issued the following instructions for developing and projecting their kinematographic pictures. The information will, doubtless, be found generally useful:—

Prepare the following developer:—

Water	20 pints.
Amidol or di-amidophenol	2 ounces.
Sulphite of sodium	10 ,,

A stock solution of water and sulphite of sodium (which keeps indefinitely) may always be kept ready, and the amidol can be added as required. The relative proportions of di-amidophenol (amidol) or sulphite of sodium may be also altered to suit requirements.

The above quantity of developer is made up so as to enable the employment of ordinary-sized galvanised iron pails. It is preferable that these should be enamelled in white on the inner side. For development take two pails filled with the developer. The film roll is suspended over the pail, and then passed very rapidly into the first pail, and, when the end has been reached, into the next pail of developer, so as to ensure even development. Care must be taken that the emulsion side is touched by the fingers as little as possible. The operation must be performed very quickly, continuing the process of passing from one pail to another until development is complete, the time occupied by the above developer being very short; afterwards plunge the film in a pail of plain water, taking same from the second pail when doing so.

Under these conditions development will be sufficiently uniform over the whole length of the film.

The same operation is repeated in the fixing bath, the strength of which should be one in four. Once fixed, place the film in a receptacle where the water runs continuously, and it must be left in the washing for several hours.

To avoid the film contracting after it has been fixed, it requires glycerining; the following is the formula:—

Water	15 pints.
Absolute alcohol	5 ,,
Glycerine	10 ounces.

Fill the two pails with this solution, and plunge the film successively into these. The operation must not take longer than five minutes. After that, the film is dried by suspending it on laths, and the temperature for drying should be 60° to 70° Fahr. When it is dried, it is rolled by the aid of the film roller, and is ready to be introduced into the cinematograph. Great care is recommended when passing the film from one pail to the other, in fact, altogether during the fixing, washing, and glycerining, so as to avoid any scratches and tearing of the emulsion which are produced with the greatest facility when the film curls. If the film has any tendency to form loops, they should be carefully straightened. Always keep the emulsion side uppermost, so as to avoid friction against the rims of the pails.

It is somewhat difficult to obtain very regular images of a uniform character when developing as above indicated, and for this purpose we have made special arrangements to develop films which will give perfectly regular images without fail, and we offer our clients to develop for them at a very moderate price the views which they have taken. Of course, we only guarantee perfect results provided the scene has been properly photographed.

For this purpose of making the positives a dark slide is used. This dark slide has two axles. On the lower axle the negative is placed emulsion side outwards, and around the upper side the sensitive film emulsion side inwards. The two ends are passed through the slit in the box.

Subsequently, proceed to expose the same as for negatives: only with this difference, that the positive film alone is introduced into the receiving slide, whereas the negative film will unroll outside through an opening arranged at the base of the apparatus.

The shutter must be arranged so as to form a *complete semicircle.*

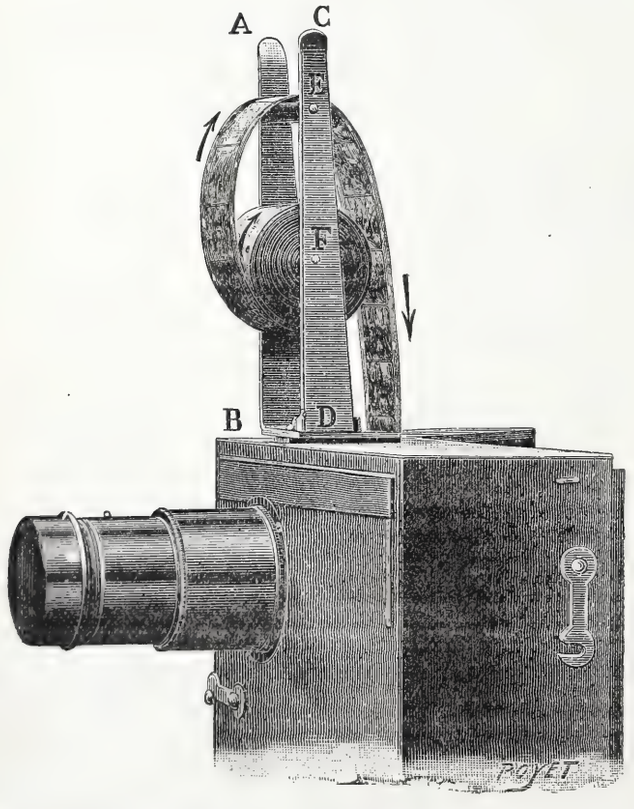
To make the exposure, close the apparatus, unscrew and remove the lens, and place before the circular opening at a convenient distance a light, either a gas flame or petroleum lamp. The distance which this light must be placed depends on the nature of its intensity and the

density and transparency of the negative. No precise instructions can, therefore, be given, but a few small strips exposed will give the necessary information to the operator, The light, having been conveniently placed, all that remains is to turn the handle; the negative will fall into the basket provided under the tripod, whilst the positive will be rolled into the receiving box.

The additional material necessary for projecting with the cinematograph having a projecting lens is an electric lantern, a resistance coil, a stand, and a screen.

The lantern, containing the regulator, is provided with a condenser, in the shape of a globular glass bottle containing water, which concentrates the light of the arc on to the projecting machine. In order to regulate the carbons a side window is provided. The water should preferably be distilled, or a few drops of acetic acid may be added. The condenser is cased in a metal frame, fixed with four pins to the lantern, and each having a screw. The casing has a prolongation in the shape of a cylindrical tube, at the end of which is a movable window with ground glass. This window is opened at the moment of projecting. When regulating the light, turn the globe containing the water until the light is at its maximum. This water globe replaces advantageously the glass condensing lens. As a matter of fact, the glass condensing lens has many disadvantages, especially that of concentrating the heat rays on the film when same is stationary. By the glass globe this is avoided, as the water attracts all the heat, and the power of lighting is increased; the light is white, the greenish colouration of the lens being suppressed. Should the water after, say, about an hour, begin to boil, it is only necessary to insert a small piece of coke, attached to a wire, and the evaporation will proceed with the greatest regularity.

This arrangement avoids any accidents due to carelessness on the part of the operator, as the concentrating object absorbs the heat rays.



The arc light regulator has two metallic frames supporting the carbons. These frames can be manipulated by hand in many directions—upwards, downwards, sidewards, &c., so that the rays are always in the centre. The carbons required are from three to four millimetres for a current of fifteen ampères.

The resistance coil is a well-constructed arrangement with which the current can be effectually regulated.

The projecting lens: We have a number of these lenses for short, medium, and long focus, enabling the size of the images to be projected from 5×4 feet up to 20×15 feet.

The projecting stand is made of strong oak wood throughout, and is arranged so that for travelling purposes all the boxes containing the various apparatus fit into the openings of the stand.

The projecting screen should be of white linen without a seam.

If the projecting is done by transparency, *i.e.*, if the screen is between the spectators and the apparatus, it is necessary to wet same with glycerine and water in the proportion of one in ten; this renders the screen very transparent. These transparent projections give inverse images to those which are projected from the front of the screen.

If it is necessary to re-establish the pictures on the screen and to show same in their proper way, that is, from the right, it suffices to turn the film so that the emulsion side is rolled inwards.

The electric lighting of the hall is divided into two groups of lamps; one of the groups is suppressed while the pictures are shown, and the other can be used to light up the hall whilst changing the films. It is hardly necessary to point out that the electric installation should be provided with safety fuses in case the current becomes too strong. We recommend the employment of continuous electric current; it is far preferable to the alternating current, in the latter case the lighting being variable and less brilliant.

When projecting, the shutter should be placed so that the two discs cover each other exactly. This permits the maximum illumination of the screen, and care should be taken, before pictures are shown, that the maximum illumination on the screen is obtained from the lantern.

For running off the pictures easily, the film-holder is used. This is composed of two uprights, A B, C D. The upright, A B, has two horizontal bars, E F. The upright, C D, is on a hinge and can be laid flat. The roll is inserted and fixed to the pin, F, and the upright is again closed. The film is then passed through the bridging and is ready for projection.

When the picture has been shown, the lights in the hall are turned up, and the next picture is put on the machine.

In conclusion, we would give a few hints as to the care which should be given to the apparatus and films.

To begin with—the apparatus must be kept constantly in a state of cleanliness and must be properly oiled with vaseline, or a mixture of petroleum and olive oil. If any parts get clogged, they should be cleaned with benzine. During the cleaning avoid carefully introducing any foreign matter between the eccentric and the sprocket frame, which would irredeemably make the apparatus go wrong.

The glass window should be cleaned carefully after each picture has been shown, so that the film is not damaged by any dust or grit.

The lenses should be cleaned with a brush or silk handkerchief to avoid any scratches.

The films must be kept in a state of a regular elasticity; for this purpose a zinc box is supplied—this box has two compartments, the lower part should have a piece of felt or sponge impregnated with water, over which is placed a wire sieve on which the circular boxes containing the films (the lids of same being off) are placed. The films are left like this over night and can be used again the next day.

It happens sometimes to operators who are new to the machine that they tear the film during projection. This habitually happens near the perforated holes. To avoid it, it is sufficient before each performance to verify whether the springs in the bridging press too hard on the film, and whether the film passes along easily in its channel, and whether the film-holder is put in its proper place. If the film has been torn, it is necessary to repair it immediately, otherwise it is a cause of other new defects. We supply for repairing films a solution of amyl-acetate, with which the defects are very easily repaired.

THE TELE-MICROSCOPE.

The following account of Dr. Elmer Gates' alleged experiments in "telemicrography" is taken from a contemporary:—

It is now nearly a year ago since I first described to several friends the method of applying the objective to a second microscope to the focal plane produced by the objective, or the objective and ocular, of a first microscope, which I had at that time just accomplished. I succeeded by this method in resolving the markings of a test object by a sixth-inch objective in the first instrument and no ocular, and a two-third inch objective in the second, which could not be seen or resolved by a one-sixteenth-inch oil immersion lens and a half-inch ocular, full-tube length. I used an additional or supplementary tube, with an objective at its lower end and an ocular at its upper end, and removed the ocular of the first microscope and inserted this tube into the main tube of the first microscope. Later, for convenience, I mounted this tube upon a stand of its own. But I delayed the publication of the matter because the image was so faint if I used higher power than those mentioned, and when I tried a sixth on a sixth I could see nothing at all, and I supposed there was nothing there.

But I again took up the subject last August, and I discovered that, if the particles of dust and aqueous vapour globules be removed from the interiors of the microscope and camera, a very much better image is obtained with the same amount of illumination upon the condenser. I also found why a photo-micrograph cannot be viewed with a lens so as to reveal new detail. It is because all details much less than the ten-thousandth of a millimetre apart are blurred into one detail by the irradiation and diffusion of light in the sensitive plate.

I took up the matter again, and on September 12 I made the first photo-micrograph by the new method, and on the same day I tried, unsuccessfully, to apply the new method to the telescope; but on the 14th I succeeded. I used for the purpose my two-and-a-half-inch Bardou telescope, with low-power terrestrial eyepiece, and I focussed it upon a pine-tree at Fort Reno, about two and a half miles distant from my laboratory

n Chevy Chase. Two entire trees were included in the field of vision, and any particular branch looked like an irregular patch of green. Then I removed from the eyepiece of the telescope the front lens and adjusted my microscope so as to focus upon the focal plane in the telescope. The microscope had a 4-inch objective and a 1-inch ocular, and, to my great pleasure and surprise, I distinctly saw the separate pine needles upon a single twig.

Four persons beside myself saw the experiment, and were pleased with the new telescope.

The hazy condition of the atmosphere and the dancing of the light waves, however, prevented best results when looking at very distant terrestrial objects. A scientific friend suggested as a test for the new telescope that I photograph a near object, so as to eliminate these obstructions. The tele-microscope gave with its lowest powers at least twenty-five times the greater magnification.

But this is a mere trifle to what the new instrument can do. A one-sixth inch lens for the objective of the microscope instead of the one inch, and the magnification becomes more than 500 times greater, and to this there is no limit, except the capacity of the art of photo-micrography to produce a picture by exceedingly faint light. Now, the main feature of my new microscope is the method by which I have been able to photograph with light many thousand times fainter than has hitherto been deemed possible. But the new telescope does more than merely magnify, it resolves or makes visible details that cannot be seen by the old method. And this is a matter of great importance, and must be demonstrated. This is especially necessary, because the true nature and signification of my invention of the double microscope does not seem to have been grasped from my too brief description.

It has been stated by a distinguished Western professor that every one acquainted with optics knows that it is not difficult to get greater magnification, but the trouble is to get enough light and definition. He hints that I have acquired a reputation for discovering impossible things, and the inference is that I am still drowsily ignorant of the most elementary facts in optics. Now, the fact is that it is this very definition and increased light that I get by the new method, and at the same time I *can photograph with many thousand times less light than has hitherto been needed.* If any one will take the trouble to come to my laboratory, I will be pleased to show an object under a first-class one-sixteenth inch homogeneous immersion lens, full tube length, one-inch ocular, and then, with two low-power lenses of large aperture, I will show details in that same object that cannot be seen with the sixteenth. And that demonstrates that I get better resolving power.

Now to my point. I said that I must prove that the new telescope will resolve lines or details that the old telescope cannot. The test object used for the demonstration consists of a checker-board arrangement of black and light-coloured squares, in which the light squares consist of black lines closely ruled. This was taken such a distance from the telescope that with its greatest magnifying power these lines could not be seen. Then, to make it doubly sure, the card was removed to a still greater distance, and then the microscope was applied to the telescope, and these lines were not only easily seen, but looked as large as the stripes on our American flag.

If such excellent results can be achieved with a 10*l.* two-and-a-half-inch telescope and a microscope with a two-third-inch objective, what may we not expect with a larger telescope and higher microscope objective?

"But halt!" cries a voice from the Pacific coast; "you may get magnification, but the trouble is about the light!"

Now, that is just precisely where the trouble was found at the very beginning of my studies of the microscope, more than twenty years ago, and that is just where the new method of photo-micrography comes to our aid.

In the first place all high powers in both the double microscope and the tele-microscope require the aid of photography to render their images visible. Beyond a sixth on a sixth in a double microscope, and beyond a sixth-inch objective on the tele-microscope, the human eye cannot hope to see the image, and I have never attempted to make it do so. What I have accomplished is the power to photograph with such an infinitesimal quantity of light that in all former methods of photo-micrography there would not be the slightest trace of an image produced.

All details less than the ten-thousandth of a millimetre apart in the image will not be photographed, hence I use a second microscope to separate these details to a greater distance before photographing them.

But, when with a single microscope we use lenses of high power, the aperture for the admission of light becomes so small that only a faint image is produced, and, when a second microscope is applied to the first, this light becomes less still. Before I achieved my recent results photographs had been made with a magnification of at least 10,000 diameters; that means 100,000,000 times the area of the object—that is, any given detail in the image was produced with but one-hundred-millionth as much light as comes from an equal area of the object. This seems a very faint light already; but I have succeeded in getting a photograph with only the one-thirteenth-hundredth of that much light, because I did not use a lens of small aperture, like a sixteenth, the whole in which is not larger than one of the periods with which this article is punctuated, nor a seventy-fifth, the whole of which is still smaller, but instead I used a large sixth-inch objective in each microscope, and got a magnification far beyond that which any single objective has ever made. When the hole for the passage of light through a lens, that is, when the aperture becomes too small, it acts like a pinhole or a very narrow slit or scratch. It defracts the light and breaks it up into various colours, thus interfering with the formation of a good image and wasting light that otherwise would act chemically on the sensitive plate.

There is a way to use still less light than the one-thirteen-hundredth of the one-hundred-millionth of the intensity of the object, namely, to take the dust and vapour out of the camera and microscope. These particles not only waste the rays by intercepting them, but they defract them, and thus each particle gives various-coloured rays in all directions, impeding the rays which should form the image, and thus in two ways wasting the light. These particles also reflect light on the sensitive plate, and photograph themselves faster than the image is being photographed. I find by several tests that elimination of dust and vapour permits of the use of at least one-hundredth less light—that is, with the one-hundredth of the one thirteenth-hundredth of the one hundred-millionth of the intensity of the light which comes from the object. This is equal to a magnification of three-and-a-half million diameters, or an area of twelve trillion, and I have made one photograph—a very poor one—of such a magnification.

But there is another still more important obstacle to photo-micrography with very faint light, namely, the leakage of extraneous actinic rays into the camera and microscope tubes through the joints and walls of wood and leather. These rays may leak in and act on the sensitive plate more rapidly than the image rays; but, even if the light from leakage is not so strong as the very faint light from the image, it serves to cloud the picture.

If there is no leakage of light, the plate can be exposed for hours, and even days and weeks, allowing the rays to act cumulatively. If only one-tenth less light could be used, if there were no leakage, that would make possible from ten to thirty million diameters. Hence I enclose the microscope and camera within a room or box so constructed with different substances in its walls that no actinic rays can enter.

Then I also shield from light all that space between the condenser and the first objective, thus eliminating much waste of light by interference at these points. This still further extends the limit of faintness at which photo-micrography is possible.

Then, again, I propose to use one-coloured light for highest powers, and to build the microscope especially for that particular wave-length. It is well known that the different colours have their foci at different distances from the lens, and to make them all fall at the same plane several other lenses are introduced to correct what is called chromatic aberration. These lenses are not aids to magnification or resolving power, but are introduced to correct for these rays of different colour. Now, I am building a microscope especially for one-coloured light, and, so far as I know, it will be the first of its kind. It will need correction for spherical aberration only. Being less thickness of glass across the path of the rays, there will be less loss of light. There will also be less loss resulting from interference between different coloured rays. This still further extends the limit of faint light photography.

By using one-coloured light a much greater quantity can be focussed on the object without danger of the condenser acting as a burning glass to destroy what is being examined. I am arranging to use large prisms, so as to get a large area of one-coloured light, and then, by condensing and parallelising lenses, I desire to reduce it to a beam several hundred or a thousand times less than its original area. I can, judging from some former experiments, put at least one hundred times more than the usual amount of light through the microscope.

It must be evident that, by these improvements, there arises a new art of photography, and that faintness of image is no detriment to the new microscope, but makes it possible. The limit is, doubtless, far beyond three-and-a-half million diameters, and is a photo-chemic limit. We may imagine that, when the rays become too weak, they will fail to dissociate the silver salt, no matter how long they act. Even this limit can be extended by heating the plate; but the photo-chemic limit is far, far beyond ten million diameters.

All this explanation has been necessary to show how the new telescope expects to photograph with faint images. The principles of the double microscope are all applicable to the telescope, requiring but little further invention and technique.

The limit of tele-photo-micrography is probably of a different kind—namely, the shaking of the instrument and the difficulty to get a sufficiently accurate clockwork mechanism to make the telescope follow the particular part of the planet being photographed. Thus, when I focus my small telescope on the moon, it moves out of the field of vision in seventy seconds. Now, when I apply to the telescope a six-inch objective, only a very small part of the former field of vision can be seen at once, and that part will move out of the field of view, if the telescope be stationary, in one-sixth-hundredth of seventy seconds. It is for this reason that the enormously high powers of the double microscope may not be applicable to the telescope; but I have seen enough to know that an ultra-telescopic domain has been opened, and new fields of observation await the astronomer.

It is probable that a small and cheap telescope and a small and cheap microscope combined, will give by this new method better results than have hitherto been possible by the largest and most expensive instruments.

I may remark that I have applied a third microscope to the double microscope, with the results conformable to the laws governing the two in combination.

I regret that I have not the facilities to follow out the further improvement of the telescope. To do so, I would need a somewhat better telescope—say a six or eight-inch—and a siderostat. I would gladly devote more time also to the perfection of the microscope and to building an entirely new instrument throughout.

The first special use which I shall make of the double microscope will be in the study of cellular psychology, to determine what structural and metabolic changes result from each kind of mental activity in the cell, and to study the specific effects of medicines, forces, and foods upon uncellular organisms. When that has been accomplished, we may hope better to understand and study the effects of such agents on a more complex uncellular organism.

All such studies of the mind, as we find it manifested in living organisms, lead to a science of psychology, and out of such a science there is arising a corresponding art which teaches us how to best regulate body and environment to promote mentation, and how best to regulate and apply each of the mental functions.

COLOUR PHOTOGRAPHY.

There was a numerous attendance of members and friends at the last meeting of the Oxford Camera Club, held in the University Museum. Mr. E. A. Ryman Hall was elected to the Chair, and, after the ordinary business had been concluded, he called upon

Sir William Herschel (President), who, in giving his paper on *Colour Photography*, said that what he was to discuss that night was the power of rendering to our eyes pictures of objects in their natural colours. There were two kinds of photographs to be considered. First, that kind which was produced by the sun's unaided effort; and, second, that which was produced with the help of adventitious additions from the hand of man. Before saying more, he wished to remark on the great advantages which had accured to the human race from the science of photography in mere black and white. What had it not done for enhancing the pleasantness of life, and, he might also say, for extending the very borders of our intellect? It portrayed for us the objects of nature in all their matchless beauty of form and gradation of shade. What had it not done in preserving to us faithful pictures of inanimate things and of those full of motion? By its patience we had discovered, in the heavens, facts and things beyond our eyesight, and yet its rapidity was so great that we had been able to picture the very waves of sound itself, and the vacuum created by the passage of the cannon ball through the air. He was sorry that time would not allow him to say even a few words about that wonderful organ of the human body, the eye. Suffice it to say that our knowledge was very meagre on the methods of conveying impressions from the eye to the brain. Especially was this the case with regard to colour impressions, and he hoped presently, by the help of the apparatus and the assistant Mr. Ives had been so kind as to send down, to show how easily the eye could be deluded. They all knew that, if minute blue and yellow particles were mixed sufficiently thoroughly the eye could not distinguish between them, and received the general impression of green. Now, colour played such a large part in the enjoyment of life that it was not surprising that all should be deeply interested in the subject of obtaining coloured pictures by photographic means. Nevertheless, it was only lately that success had begun to be obtained. A happy chance in the earliest days of photography led people to hope that they were even then on the very threshold of the discovery of colour photography. It was in 1848 that Becquerel obtained a photograph of the spectrum in colour, but this was evanescent, and no means could be found to fix it. As long as it was kept from too strong a light the colours would remain brilliant, and he had one of Becquerel's plates there in which the colours were still bright, but they would promptly go if it was exposed to daylight. The explanation of this chance discovery no man of science had been able to suggest until quite recently. With such a check on progress in the matter of obtaining coloured pictures direct, men naturally turned their attention to working for coloured pictures in the direction of black and white. Now, it had been pointed out that there were three primary colours. He would not enter into the dispute as to which they were, but simply say that, by the proper co-operation of red, green, and violet-blue any colour could be produced. [At this point, Mr. Shepherd, assistant to Mr. Ives, threw on the screen three discs of the colours named, which discs he was able to accurately blend by an ingenious adaptation of a limelight lantern with three objectives.]

Proceeding, the lecturer pointed out how the blending of the red and green produced a pale yellow, that of the blue and green a brighter blue, that of the red and blue a pink, and that of the red, green, and blue a white disc. If, however, instead of simply blending the discs on the screen, the coloured slides were put behind each other in the lantern, the red and green together, and blue and red together, each caused darkness, but the blue and green did not. Now, if pictures taken in these three colours were blended on the screen, we obtained a coloured picture of the object photographed. This, however, was not so easy as it sounded, for it would not do to use the same tint of screen for taking the picture as was used afterwards for viewing it, and Mr. Ives deserved the greatest credit for the way in which he had brought his intellect to bear on the subject, and made countless experiments to obtain the desired end. [Magnificent coloured photographs were then thrown on the screen of a vase of flowers, a dish of fruit, a Japanese fan, a box of sweets, a pile of smoking materials, a geranium in a pot, &c.] The President, continuing, pointed out that now Becquerel's picture of the spectrum had become a permanent fact through the investigations of Lippmann, who had been generous and kind enough to send him an example of his work when he (the speaker) had appealed to him in the name of the Oxford Photographic Society. The plate had only arrived that morning, and he was overjoyed at receiving it. M. Lippmann's results were not so good and brilliant as those of Mr. Ives, but he believed they possessed the germ of ultimate success in colour photography. The method of procedure was very simple. M. Lippmann's dark slide was a sort of tank, of which the photographic plate formed the wall nearest the lens of the camera, the film pointing inwards. Before use the tank was filled with mercury, this making a looking-glass in contact with the film. The other operations were practically identical with those for ordinary photography. It was not, however, till the plate was dry that the colours could be seen, and that only by reflected light. He was not optician enough, he was not mathematician enough, he was not scientific enough to explain in proper language, or even understand himself, the reasons of this phenomenon. He could only say that it was supposed that in the ordinary plate the deposit of minute silver particles were practically uniform throughout the thickness of the film. In the Lippmann plate, on the other hand, the deposit of silver was in layers, the distances of the layers apart being the distances of the wave-lengths of the different colours. The film might be compared to a book, inwhich the printing was the silver deposit and the different thicknesses of the paper the distances of the different wave-lengths that the layers of silver were apart. When the reflected light came through the plate, in each portion of the film only those colours would pass through whose wave-lengths corresponded to the distances of the layers apart. This, then, would explain why there were no colours when the plate was wet, for then the gelatine would swell, and cause the layers to be placed at the wrong distances from each other. Now, he suggested that Becquerel's colours were probably due to the same cause, but the reason they could not be preserved was that the substance used for the film was disorganized by its fixer. Perhaps, if the plate were soaked in gelatine and then fixed, the colours would be permanent, but he was not going to try any experiments with his Becquerel plate, for it was far too precious.

MANCHESTER PHOTOGRAPHIC SOCIETY.

Lantern Section.

At the second meeting of the forty-third session of the above Society, held on Wednesday evening, November 24, Mr. Abel Heywood gave a lecture, illustrated with lantern slides, entitled

The Characteristics of Southern Norway.

Mr. J. Evans manipulated the lantern. According to Mr. Heywood's remarks, in some ancient period Norway has been what Greenland is to-day, as they are very similar in character. It was formed at a somewhat late period, and is the product of ice and water chiefly. The glaciers of the country were fully illustrated, and the lecturer explained their slow motion. Norway consists of a plain in which deep furrows have been cut by means of ice and water, these furrows now being called valleys. It might be supposed that Norway consists of three tiers one above the other—the lowest one, valleys; the middle one called Soeter Land; whilst the mountain wastes, or moraines, were at the top. In the lower valleys are situated the fjords, which some people term lakes, but this is not so, they being, indeed, composed of sea water. They are not tidal, but, owing to the wind, their depth varies a little, for if blowing inwards a rise is the result, whilst, if blowing from the land, then a decrease is the result. The valleys occupy a very small area compared with the mountain plains, and they are the great drains to them, as is proved by the presence of rivers in these valleys, which, if followed up, will lead to waterfalls of various sizes and grandeur. In one place alone there are to be seen at the same time three large falls, there being several others in the vicinity. Soeter Land, which is the middle tier, is only habitable in the summer, and is then used by the cattle, owing to the good pastures it contains. Various berries may be seen growing in this district, and Mr. Heywood said he had seen there the crow-berry, which he had also seen growing on Kinder Scout, in Derbyshire. On the mountain wastes snow lies most of the year, and there are, consequently, no roads over them. An impression of the people was given to the audience by means of several slides from photographs of the lecturer's Norwegian friends. Norwegian houses are built chiefly of wood, many of the older ones being curiously carved and decorated; but, as these are either being destroyed by fire or become dilapidated and consequently condemned, new ones are being put up in either brick or stone. Amongst the churches shown was the famous Borgund Church. Of hotels there are plenty, from the primitive wooden hut on the mountains to the spacious and magnificent stone buildings by the fjord sides. These fjords are the great high-roads of travel, and are

much used by tourists wishing to journey from one place to another without climbing the mountains. On the roads the carriole is the equivalent to our English carriage. As there are rivers in Norway, then here must be bridges crossing them, and some curious ones were amongst those shown, indicating how they were constructed from the material nearest at hand. After showing what beautiful results were to be obtained with the camera in Norway, Mr. Heywood (who is an excellent angler as well as a photographer) exhibited a slide showing what he had obtained in a day with his rod.

Although the audience was not large, yet those present enjoyed the very interesting lecture and pictures they had seen.

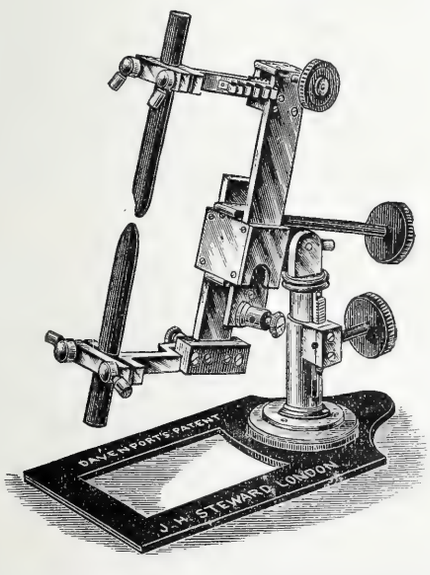
THE DAVENPORT-STEWARD UNIVERSAL ARC LAMP.

J. H. Steward, 406, Strand, W.C.

The Davenport-Steward Universal Arc Lamp is easily adapted to existing lanterns, and to apparatus for projecting animated photographs. It can be used on any current, direct or alternating, and is so made that it will work well with small carbons on a 7 to 10 ampère current, or with larger carbons up to 15 or 20 ampères.

Any desired light can be obtained, from 500 to 5000 candle power.

The mechanical arrangement of the Electric Arc Regulator or lamp is as follows: The upper rod and milled head is provided with pinions of different sizes, so as to engage in the rackworks fixed on the vertical bars carrying the carbon holders. As the milled head is turned to the left the carbons approach each other, and when it is turned to the right they are separated. This movement regulates the amount required to make good



the consumption of carbon, and is so arranged that, if the milled head is slightly turned every two or three minutes, the light is maintained in the optical centre.

Complete adjustments are provided, viz., the vertical standard with rack and pinion for altering height, with a rotary fitting and clamp at top providing for lateral centering. The hinge for angling the lamp is very strong and well made, and the clamp secures it at any position between the vertical and that shown in the illustration. The carbon holders will securely hold any size carbons from 8 mm. upwards, and a special feature in the lamp is the rackwork adjustment to top carbon holder, to ensure quickly the best position for the crater when using the lamp tilted, or to bring the carbons in true line when using the lamp upright for experiments or on an alternating current. The advantage of having a rising adjustment to the vertical standard rather than at any other part of the electric light regulator is that its use does not alter the distance of the light from the condenser, and therefore it simplifies keeping the light at true position for micro-photography, &c.

PLANTS THAT GIVE LIGHT BY NIGHT.

The following account of the phosphorescence of plants, which is much more common than most persons imagine, though few have observed it, is contributed to *La Nature* by M. Charles Marsillon: "The phosphorescent gleam that certain plants and flowers give out in darkness constitutes one of the strangest phenomena of the vegetable kingdom. The illustrious Linnæus was the first to call the attention of the scientific world to this singular phenomenon, which before his time had been unobserved or unknown. While walking in his father's garden on a calm, warm, and fine summer night, he was surprised to see a bunch of Tropæolum majus, the common nasturtium, or capucine, that seemed to have flowers that shone with iridescent colours in the midst of the gloom.

"Captivated by the novelty of the spectacle, the future scientist repeated his nocturnal walk many times, and each time he saw the fantastic gleams of the capucine flowers. An electrician of the period, Wilcke, to whom the young Linnæus related his interesting observations, attributed the display to some electric phenomenon, an opinion that was shared by a number of writers who mentioned the curious property.

"Nevertheless, all did not agree on this point. Some were of the opinion that this phosporescence was merely apparent, and was an optical illusion. . . .

"Numerous other flowers possess the strange property observed in the nasturtium. Among them, the marsh lily, that grows abundantly in the marshes of South Africa, presents the same peculiarities. Erasmus Darwin, who studied this flower closely, regarded it as the most perfect type of phosphorescent vegetables. The assertions of a great number of scientific observers leave no doubt of the fact that certain plants have this singular property of becoming luminous at night.

"A Swedish naturalist, Haggren, carried his love for this new kind of investigation so far as to employ a special watchman to walk about his garden for whole nights, and notify him at once of luminous plants and flowers. The scientist was thus able to prove that the phosphorescence was noted especially after a very sunny day, while it was invisible in rainy weather. The light increased in intensity during July and August. It appeared about half an hour after sunset and vanished at dawn.

"Haggren carried his investigations farther still. He subjected these singular flowers to a microscopic examination to find out whether the phenomenon did not depend on the presence of insects or other organisms. Repeated experiment showed the improbability of this; he found nothing, and concluded that, according to the opinion of Wilcke, the phenomenon had probably an electric origin. He thought, besides, that the pollen of the flower probably played an important part in the production of the light. His opinion seemed to be confirmed by the fact that the flower of the nasturtium, on which he experimented, shone with a brighter light at the time of full fluorescence.

"Dowden and three other botanists observed the same phenomenon at different times. They reported their observations in the *London Botanical Journal* about 1842. More recently, during the past ten years, Canon Russell has reported the same phenomena. His scientific papers prove that the phosphorescence extends to the leaves of certain plants, those of the nasturtium in particular. This scientist thus proved that the light persists even after the leaves have been detached from the parent stem.

"In September, 1891, he wrote to *Science Gossip* as follows: 'During the evening of June 19, 1889, I was walking in my garden, when, in passing near a marigold, the Calendula officinalis, I was struck with the intense light given out by its flowers. I waited several seconds, and observed to my great surprise that the scintillating light seemed to play around the petals. I thought that I was the victim of an ocular illusion; so, to check my own observations, I called several persons and asked them if they saw anything extraordinary.

"'Several exclaimed that they saw little flames dancing around the flowers; others could scarcely distinguish them, and only at rare intervals; others still, in spite of sustained attention, could see nothing remarkable. This is, without doubt, due to the fact that the power of vision varies greatly with observers, the optic nerves being more sensitive with some than with others. The phenomenon, which began to be visible about half-past eight in the evening, lasted a whole hour, with remarkable alternations of great and of decreasing intensity. At certain moments the entire plant became phosphorescent.'

"The fraxinella, or Dictamnus fraxinella, of which there are three varieties in our gardens, the white, the red, and the purple, seems to excel all other phosphorescent flowers or plants in luminous intensity This plant secretes in abundance an essential oil that, in times of great heat, spreads in a thin layer over the surface of the flower, and then volatilises, impregnating the surrounding atmosphere with its vapour. This vapour has the property of becoming luminous in darkness, so that the flowers appear to take fire by contact with the surrounding atmosphere.

"A variety of euphorbia, the Euphorbia phosphorea, has also, in a very marked degree, the power of becoming phosphorescent during the night in the heart of the vast Brazilian forests. In the same country a sort of grass, which the natives call khuskhus, shines, at certain hours of the night, with a bright light. If we are to believe the tales of trustworthy travellers, in some cases horses and other animals browsing on this grass have stopped in surprise to see it suddenly give out light and surround them with flames that envelop their trembling limbs in all directions. . . . .

"But, if flowers have this strange property in a remarkable degree, other plants among the lichens, mosses, and fungi shine with an equally bright light in the same conditions. In the environs of Dresden especially there are several coal mines where grows a small species of agaric along the shafts and galleries. It presents to the visitor the appearance of innumerable luminous festoons of changing colours. . . . .

"The eminent naturalist, Joseph Hooker, thinks that the source of this phosphorescence is a slow combustion, without heat, that takes place in the mycelium of the fungi during a continual oxidation of its

substance. In northern India, among the agarics that flourish there, there is a cryptogam similar to that of the Dresden mines and equally luminous.

"The Agaricus olearius, a common mushroom of the south of France, grows, as its name indicates, on the bark of the olive, even in its smallest crevices. It makes its appearance as a parasite of this tree in the month of November, and transforms the trunk of the olive-tree into a phosphorescent mass, producing one of the most original effects that can be met with. . . .

"Quite as remarkable as the preceding is the Agaricus Gardneri, the parasite of a Brazilian palm. Its light, a brilliant yellowish white, may be compared, for intensity and beauty, to that given by the tropical fireflies. Another cryptogam, a native of Borneo, growing like the preceding on various kinds of trees, gives out a light with greenish tints like that of the electric spark. When the natives see this singular light shining in the black night, they flee in terror, believing that they have seen the Evil One. . . .

"We will close by noting the interesting experiments made by Dr. Tulasne on vegetable phosphorescence. He has proved that the light emitted by mushrooms disappears completely in a vacuum or when they are plunged in a vessel that contains only irrespirable gases. He infers from this that, as Hooker asserted, there is a combination between the oxygen of the surrounding atmosphere and a substance peculiar to this plant. Such is the most probable explanation, and the one generally held by scientists, of the singular phenomenon presented by phosphorescent plants."—Translated for the *Literary Digest*.

THE MAKING OF ENLARGED NEGATIVES.

At the Brixton and Clapham Camera Club, on Tuesday, November 24, Mr. W. G. Welham gave a demonstration on the above subject.

As to the reasons which would lead one to require enlarged negatives, he was of opinion that a 12 × 10 camera and plates was a heavy load to carry about all day, and, after some hours tramping about with it, one was too tired to do justice to a good subject if met with; and, as only a small proportion of the plates exposed would make negatives sufficiently good for printing in a large size, it is much more economical to work such a size as quarter-plate, enlarging the best results. For all practical purposes such enlarged negatives are equal to direct work, and, pictorially considered, often better, while one can sometimes obtain a good quarter-plate instantaneous view which it would be impossible to take on a larger plate, owing to the stopping down necessary to get good depth of focus with a long-focus lens.

He was not in favour of enlarging direct from the small negative on to bromide paper, as very rarely, in the case of amateurs, can a print be obtained equal in appearance to a good platinotype. His procedure was as follows: The original negative is taken with a quarter-plate camera, this size being strongly advised on account of its portability and convenience. The half-plate, while giving prints scarcely large enough for framing as they are, offers no advantages for the purpose of enlargement, while the initial outlay on the camera and cost of plates is much greater, and a larger and much more expensive condenser is required for the enlarging apparatus. From the quarter-plate negative a transparency is made by contact in an ordinary printing frame. For this transparency, and also for the enlargement, Mr. Welham advises the use of a plate such as Ilford or Cadett ordinary; lantern plates, which are often used for the purpose, he finds, have a tendency toward harshness. The exposure for the transparency from a medium negative is about thirty seconds, at a distance of six feet from a gas burner (Bray's); an exposure at this distance is found to give better gradation than a shorter one nearer the light. Use the developing formula advised by the makers of the plate, who should certainly know what suits it best; but be careful to avoid getting a fogged result. The transparency, after fixing and drying, is enlarged to size required, from quarter-plate to 12 × 10 requiring an exposure of about twenty seconds, with stop *f*-16, to the incandescent gas.

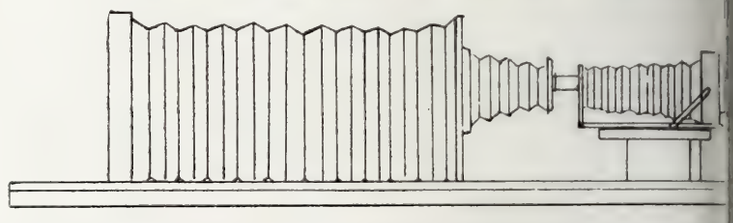
In developing the enlarged negative give plenty of time, as for some reason such negatives appear to develop very slowly, and if any attempt is made at forcing, the result is a fogged plate.

After the negative is finished, it may, of course, be printed in any desired process, and if all has been properly carried out, it will be difficult to distinguish between a print from such a negative and one taken direct by the camera.

Now for an explanation of the apparatus.

The arrangement consists of a long baseboard, near one end of which is fastened a simple enlarging camera (Lancaster's multum-in-parvo); further along the board is a small table, to which, by means of the tripod screw, is fixed the ordinary double extension quarter-plate camera with lens. In the front board of enlarger an aperture is made, and to this is fastened a small supplementary bellows, with simple front board, a hole in which admits the hood of lens. This small bellows allows easier adjustment in focussing, and of the rising and cross front of the quarter-plate camera, than when the lens is fitted into a hole made direct in the enlarger. Almost in near contact with the back of the quarter-plate camera is a block of wood carrying a condenser (six inches is best size for quarter-plate to secure even illumination), and behind all is an incandescent gas burner with bypass.

For use, the quarter-plate transparency is fixed in place of ground glass in focussing-screen frame of small camera, the light turned up, and focussing done on ground glass of enlarger, the condenser securing even lighting, the 12 × 10 dark slide containing plate put in position, light turned down, shutter of dark slide withdrawn, and exposure made by turning light up for time needed. The incandescent gas light is found to answer excellently, being neither so troublesome as lime light, nor so messy as oil. Of course, the condenser and gas burner may be moved out of the way, and the exposure made by daylight, but the convenience



of the arrangement lies in its use by artificial light, most of us having to do our work in the evening. The apparatus is equally useful for making lantern slides, the light and condenser simply being moved to the other end of the camera, the negative placed in carrier frame fitting back of large camera, and lantern plate in dark slide of the quarter-plate.

One advantage of this way of working over the cantilever lantern system is the fact that the room need not be absolutely dark, as in the case where exposure is made on to plate fixed on an easel. The swing back and front movements of camera are also useful for the adjustment of any lines out of vertical and other faults in original negative. The whole cost of the apparatus, excluding the quarter-plate camera and lens (which is used for ordinary purposes), amounts to about 4*l*.

Mr. Welham gave a successful working demonstration, making both transparency and large negatives, and concluded by exhibiting some splendid carbon prints from enlarged negatives made by him as described.

Hackney Photographic Society.—November 23, the President in the chair. Mr. J. H. Gear gave a lecture on *Lantern-slide Making*, in the course of which he said that the question had been raised as to whether lantern slides could have any claim to artistic merit. He maintained that, as a means of artistic expression, they could be made equal to paper prints, if only artistic selection were used. Again, it had been alleged that the quality of lantern slides was deteriorating nowadays, but this he denied, maintaining that as good slides were made now as formerly. It must be remembered that all the best work was not seen, for many good workers did not publicly exhibit their work. In lantern-slide making one had a great choice of processes, there being among others the Woodburytype, carbon, albumen, wet and dry collodion, and gelatino-chloride and gelatino-bromide. After describing briefly the first six, the lecturer dealt fully with the last, the gelatino-bromide process, which he said was hard to beat. It had a great range of possible tones, all obtainable by suitable exposure and development. As a developer he preferred pyro-ammonia. This, if used properly, did not stain, and required no clearing bath. Ten per cent. solutions respectively of pyro-ammonia and bromide were made up, and in the mixed developer the proportions of each varied to suit the exposure given, the amount of which latter determined the warmth of tone. The greater the exposure the warmer the tone, and with the increase of exposure the proportion of bromide must be increased. Warm tones could also be obtained by toning with uranium. A fault of this process was that the tone was liable to fade. To prevent this, a good method was to coat the finished but unmounted slide with enamel collodion. Mr. Gear gave full directions for the after-treatment of lantern slides, such as printing in clouds, making bindings, &c. The lecture was illustrated by a number of slides shown on the screen.

On Monday, November 22, before the members of the Bradford Photographic Society, Mr. Heaps, of Keighley, gave an illustrated lecture on *Enlarging*, which was listened to with interest by a large audience. The lecturer, by means of some really effective diagrams, was able to point his remarks, and drive home his various suggestions with considerable force. He began by stating the quality of the negative required, and dealt at considerable length with all the different processes, being himself apparently strongly in favour of direct enlargements, rather than the making of enlarged negatives. He also recommended the use of the lens with which the view itself had been taken. At the close of the meeting Mr. Stevenson asked several questions, and then proposed a vote of thanks, which was seconded by Mr. Clough.

[TABLISHED 1854] THE [PUBLISHED WEEKLY

British Journal of Photography

THE ORGAN OF

ELEGRAPHIC ADDRESS: "HOTOMETER, LONDON."] ALL LEADING BRITISH AND FOREIGN PHOTOGRAPHIC SOCIETIES. [TELEPHONE NO. 2722.

ol. XLIV.—No. 1964.] REGISTERED AT THE G.P.O. AS A NEWSPAPER. FRIDAY, DECEMBER 24, 1897. RIGHT OF TRANSLATION RESERVED. [PRICE ... 2d. STAMPED 2½d.

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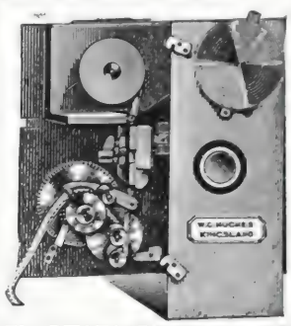
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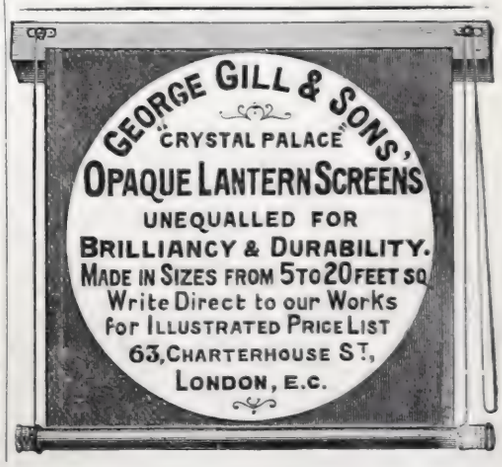
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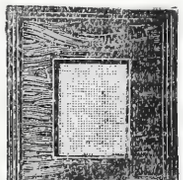
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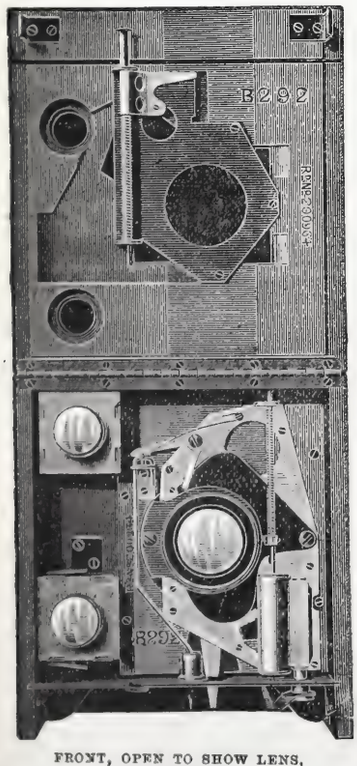
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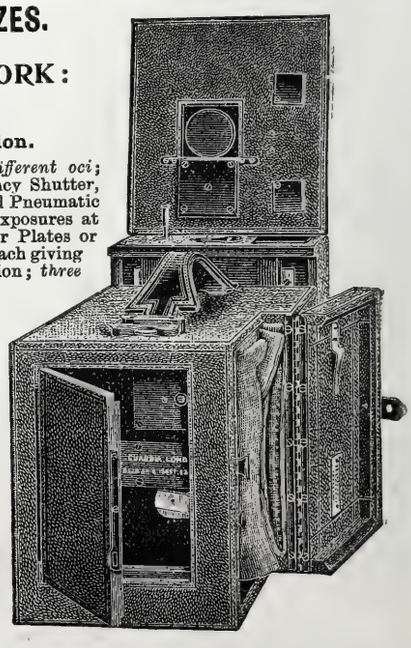
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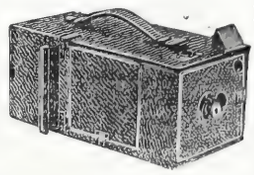
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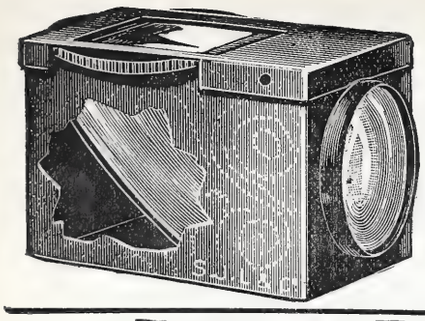
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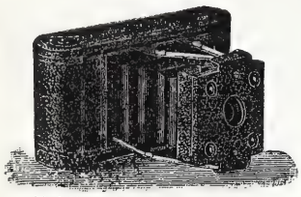
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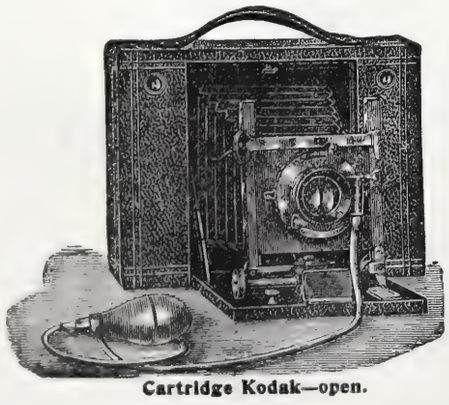
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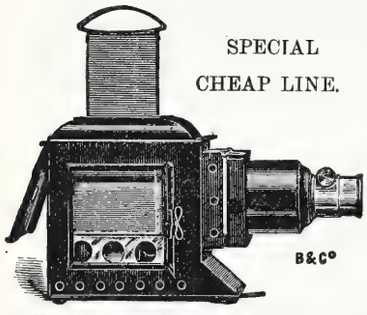
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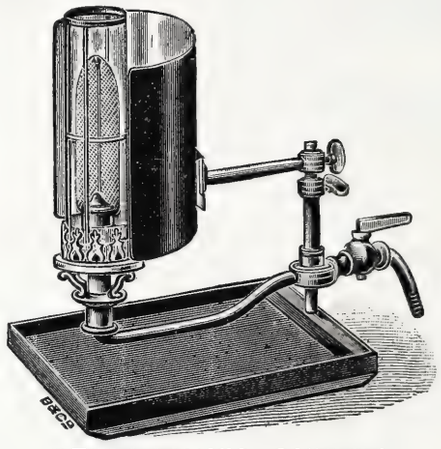
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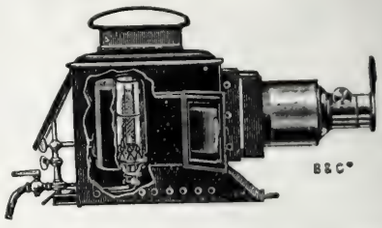


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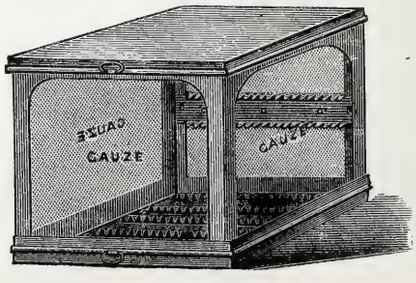




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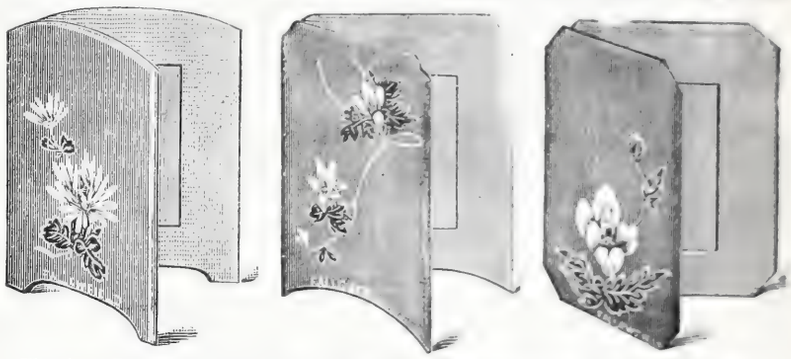
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PRESS OPINIONS.

'*British Journal Photographic Almanac* for 1898. Henry Greenwood & Co., 24 Wellington Street, Strand.—This is one of the most valuable of the regular photographic annuals, and this year's issue fully maintains the position which the book now occupies in the esteem of photographers. The literary contents are composed of special articles, copiously illustrated, on various departments of photographic art. The mass of information is so varied that, without going right through the index, one could not possibly give a fair summary of its nature. The best thing for our readers to do is to see a specimen copy and decide for themselves whether it is not worth far more than the published price of 1s.'—*British and Colonial Druggist.*

'*British Journal Photographic Almanac.* Henry Greenwood & Co., 24 Wellington Street, Strand, London.—This old veteran, fat and full, turns up again, and is as good as ever. All the old features are retained, and there is much that is new and useful. The summary of the year's work is by the editor, and he deals very fully with "Animated Photography." There is a series of very interesting articles by well-known workers and others, including G. Watmough Webster, W. B. Bolton, W. K. Burton, E. Dockree, F. Dunsterville, P. Everitt, F. M. Sutcliffe, W. J. Warren, T. R. Dallmeyer, J. H. Baldock, W. T. Wilkinson, Matthew Surface, Chapman Jones, W. Fenton-Jones, R. Penlake, Alfred Watkins, Harold Baker, Rev. F. C. Lambert, S. H. Fry, and others—a goodly list indeed. A most useful section is "Practical Notes and Suggestions of the Year," compiled from various sources by the editor, and the list of novelties is useful. A very full lot of formulæ are given, and numerous tables of value to the worker in all sorts of circumstances. The frontispiece is a very delicate print on the "Wellington" platino matt bromide paper, and we have not often seen a more charming example of child portraiture and good printing. The price of the volume is 1s. paper, and 1s. 6d. cloth.'

Photography, Dec. 17, 1897.

'*The British Journal Photographic Almanac*, 1898 (24 Wellington Street, Strand, London).—The new issue is, like its predecessors, a bulky volume, containing several hundred pages of articles (by over a hundred contributors) on subjects connected with photography. Some additions to the formulæ section have been made, and the Editor (Mr. T. Bedding, F.R.P.S.) has endeavoured to epitomise as fully as possible all the important advances and improvements in practical photography that have taken place during the past year. There are several well-executed plates, and a number of other illustrations. The volume is published at 1s. net, or, bound in cloth, 1s. 6d. net.'

Salisbury and Winchester Journal.

'*The British Journal Almanac.*—The general form and character of this familiar Annual has for years past met with such general approbation, that no considerable departure need be expected. In a volume of such comprehensive character we can well imagine that the editor's difficulty is to keep the matter within reasonable limits, and the result, as seen in the Almanac just issued, is that every inch of space contains matter of use and importance. In photography, more than in many things, the practitioner needs to be kept well posted up in the productions of the numerous manufacturers, and hence it is well that at least once a year an Annual like *The British Journal of Photography Almanac* should come to us with a vast compilation of advertisements, as well as practical articles, formulæ, and reviews. The Almanac for 1898 has, as a Frontispiece, an admirable platino-matt bromide print on Wellington paper from a negative by Byrne & Co. Next comes the Editor's resumé of the year, then some 200 pages of practical articles by well-known writers, then a very useful compilation of formulæ and practical notes, and a few notices of new apparatus, formulæ, &c. Not the least useful feature is a directory of Photographic Societies throughout the world. It is published by Greenwood & Co., of 24 Wellington Street, Strand, at 1s.; cloth, 1s. 6d. Another year comes to its close, another broad green cloth back finds a place upon our shelf, and a useful book for daily reference is added to our store.'

Amateur Photographer, December 17, 1897.

'*The British Journal Photographic Almanac* for 1898. Edited by Thos. Bedding, F.R.P.S., and published by Henry Greenwood & Co., 24 Wellington Street, Strand. Price 1s. paper, 1s. 6d. cloth. The frontispiece is a charming little child study from a negative of Byrne & Co., of Richmond, and printed by Wellington & Ward on their platino-matt bromide paper. The editor contributes a useful summary and review of the past and present condition of animated photography, and the bulk of the literary matter is of the usual style which has become associated with "annuals." We are glad to note numerous new formulæ and tables, and an index to the same. It forms a very valuable reference book to all the latest novelties of the day, and for this alone the book is well worth the money.'—*Photographic News.*

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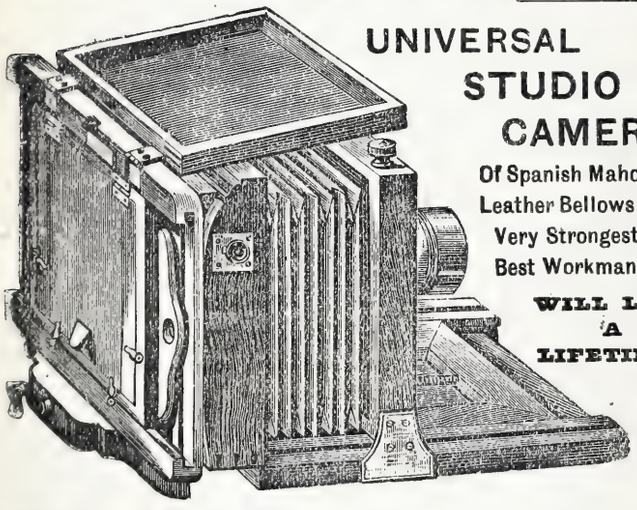
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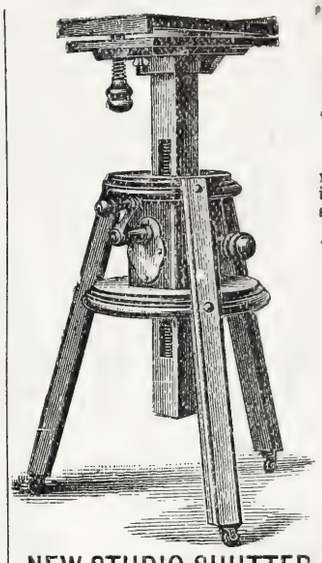
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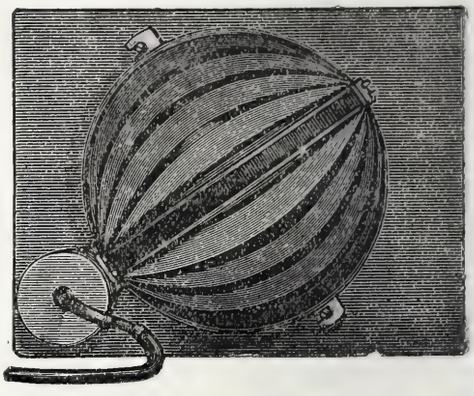
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